Solving Creative Challenges

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In 1968, Dick Fosberry won a gold medal in high jumping at the Summer Olympics.

Instead of diving with his belly over the bar and landing on his feet, he did it reverse, jumped over the bar with his back and landed on his back.

Nearly two thousand years since the Olympics in Athens, mankind invented a new technique for high jumping, the Fosberry Flop as it is now called

Amazingly, the innovation made was not due to technology, but a change in thinking.

That is what fascinates me and make my job of.

Top Barriers to Innovation

Research shows that the greatest barrier to companies being innovative is for 35 % a lack of ideas and for another 15 % red tape bureaucracy.

They rely on a handful creative but ill adapted employees or passively wait for innovations to emerge out of the blue. And then killing them by red tape.

But are there other ways?

Aambidextrous organizations need a Concept R&D department. Like an R&D department for new product development and using new technologies, but now for the purpose of providing new concepts and ideas.

They organize triple loop learning in the organization.

Ask your Concept R&D Department

- *In an off-shore gas drilling company: new concepts that reduce the costs dramatically*
- *In an airport: a radical new concept for a body scanner for airports*
- *In a seaport: some radical ideas to streamline port operations*
- *In a technology company: innovative ideas for developing apps*

Constructing creative Ideas and Concepts — Creativity

Some research just published in the British Journal of Psychiatry claims that "creative" people are 90 percent more likely than everyone else to suffer from schizophrenia, 39 percent more likely to go to hospital with depression and 62 percent more likely to do so for bipolar disorder.

There is a glaring error in the study, however. The researchers looked at what subject those who did suffer from such problems studied at university, and decided that people who had completed a degree in an artistic subject like art, music or drama were "creative" (whereas law degree students were not).

A Concept R&D Department

Such a concept R&D department would be involved in constructing ideas and concepts, that is :

- Not passively waiting for ideas
- Not looking for ideas, as if new ideas and concepts are already out there and have just to be discovered, like precious metals somewhere in the bush of Africa
- Not even generating ideas

But in methodical constructing.

But what is creative?

Most people associate creativity with doing things with colors, or with your hands, or with art. There are participants in my sessions that claim that they are not creative, because they cannot draw.

I would like to introduce another concept of creativity:
the ability
- to generate alternatives
- to break thinking patterns

Alternatives

Creativity

Thinking Patterns

Inside: single loop learning

After: second loop learning
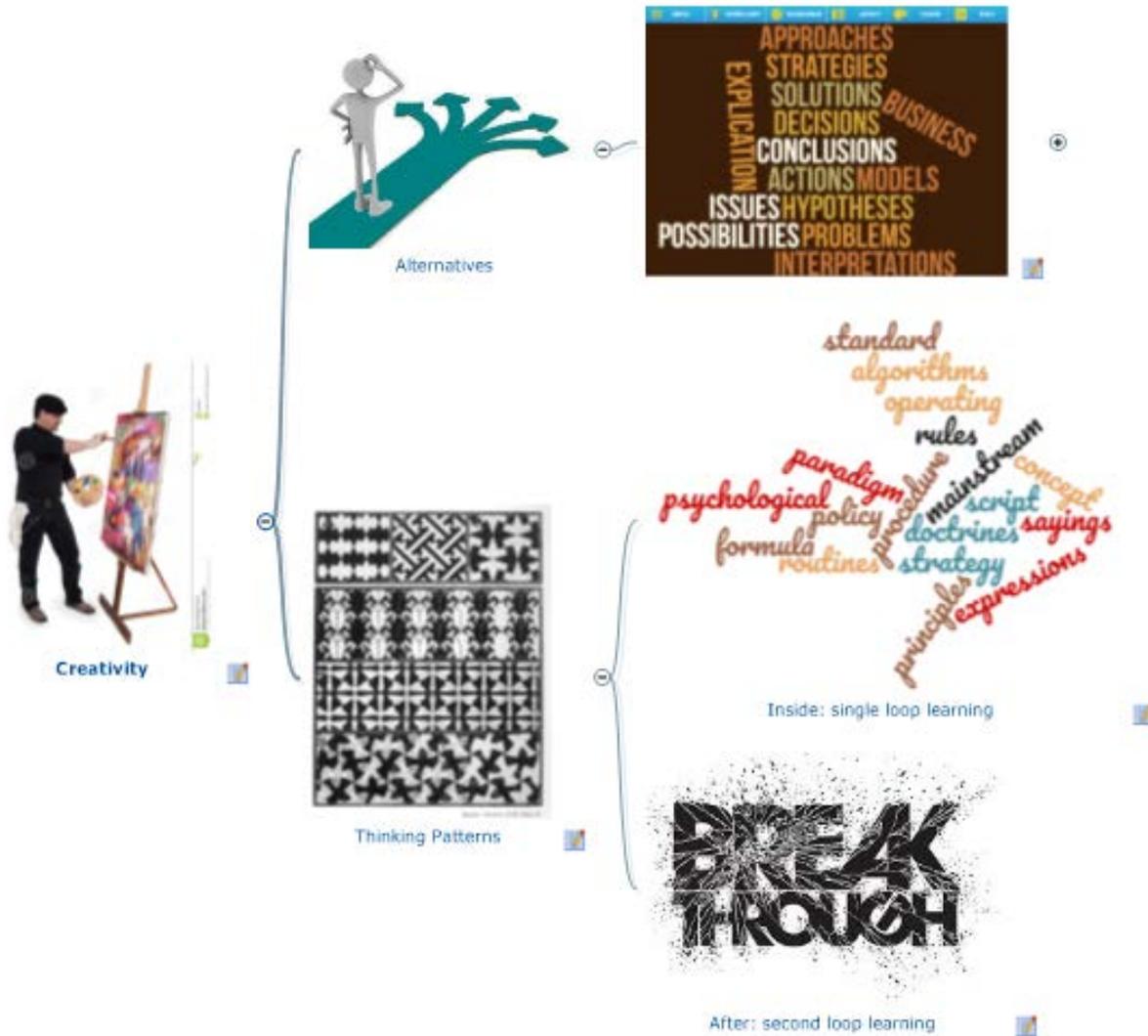
Alternatives

Creativity is about thinking up alternatives for strategies, solutions, ideas, possibilities, conclusions,….

But also thinking up alternative interpretations. F.i for
- crime fighters
- investigative journalists
- sales figures
- cold case researchers

A creative person is able to come up with at least 15 explanations what it means that a man at a gas station throws cans of coke into his petrol tank

It is all about challinging thinking patterns as directed by algorithms, rules, saying, expressions, doctrines standard operating procedures, psychological scripts,…...

Creativity is escaping single loop learning: double loop learning

90 degrees

L1

L2

Lateral Thinking

Theory of Inventive Problem Solving
TRIZ
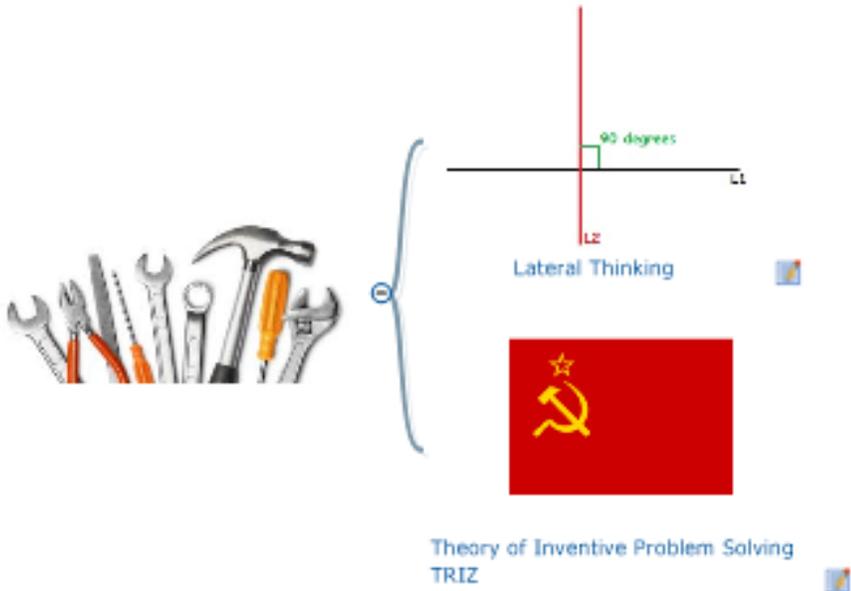
Petrol tanks of Russian warplanes were very vulnerable to enemy fire due to the explosion hazard of semi-empty tanks. They thought that filling the petrol tanks with inert gas would be a solution. But the installation of an inert gas generator made the aircraft heavier and therefore slower, and thus more vulnerable. They solved the problem, not by optimizing the weight of the gas generator, but by complete removal of the contradiction: there is a inert gas generator and at the same time there is not.
Try to solve the problem by asking yourself: what resources inside the warpane could I use to produce inert gas?

Tools

There are several world renowned creative thinking tools with which you can deliberately construct ideas.

- **Lateral thinking**. Normal, logical arguing is called vertical thinking. At right angles to this is lateral thinking: escape from "normal" thinking. It was invented by Edward de Bono in the 1980-ies. An example that has become very famous was with Shell Oil. It was related to drilling. As you may know when drilling down, it is done horizontally, to get more oil. Today it is fact... but back in 1971 it was very unusual. The problem was not only related to horizontal drilling but also to Lateral Thinking. You can run out of petrol but not out of thinking.

Theory of Inventive Problem Solving (TRIZ). It is based on studying some thousands patents. They derived general categories of problems and connected them with categories of general solutions. Interesting, an innovation is based on the complete removal of contradictions. Most western engineers are educated in optimizing, trading off bad effects with good effects.

It is mainly used for technical innovations, for trimming (making installations less heavy, costly, complex, etc.) and for patent circumventing.

Divide a square in 4 equal parts in as much ways but at least 4
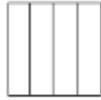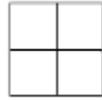
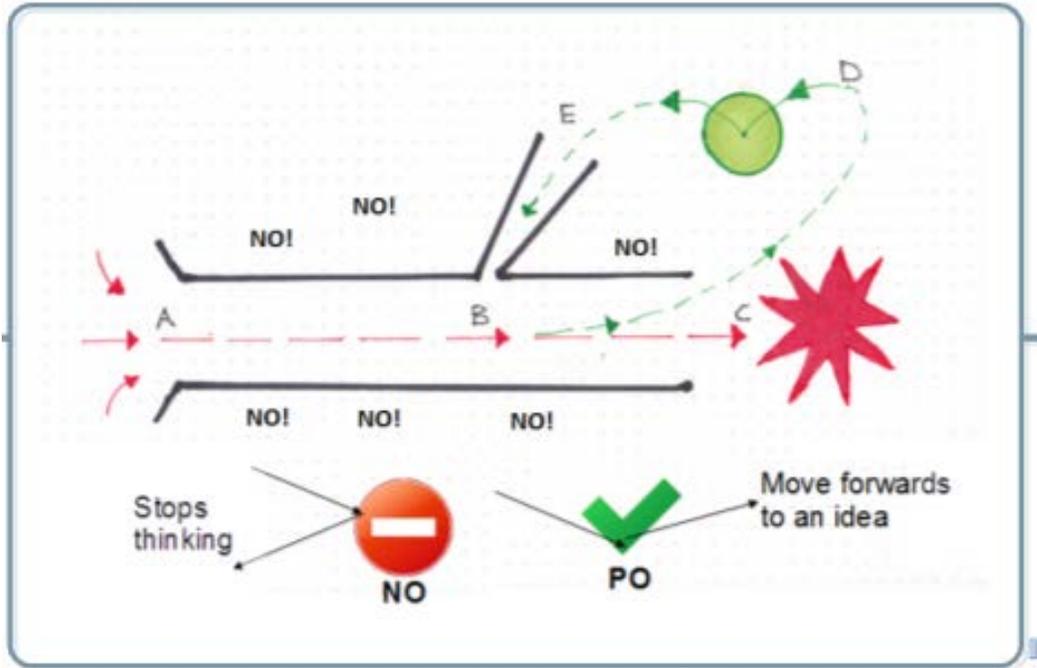**Breaking thinking patterns**

Coming up with alternatives is not that easy.

When asked to divide a square in 4 equal parts in as much as possible ways, most people do not come up with more than 4 alternatives.

They are unable to break the thinking pattern they have in use, unless they are given a thinking instruction.

Then they come easily to 12 alternatives of more by escaping the standard approach: mostly using straight lines.

Most innovations are like this: more-of-the-same.

Information is channeling itself with the speed of light to a conclusion, a solution or an idea (A →B →C), thereby missing alternatives, as represented here with the road B →E.

It is single loop learning.
Sometimes it is called vertical thinking.

Main Street Thinking

New information (A) in our brains gets always in some way associated or combined with all other available information. The already existing information then in turn determines what new information is observed. In psychology it is called confirmation bias.

The processing of information in our brains has a feedback effect: new observations fit into existing frameworks, which in itself controls the observation. In that way thinking patterns are formed.
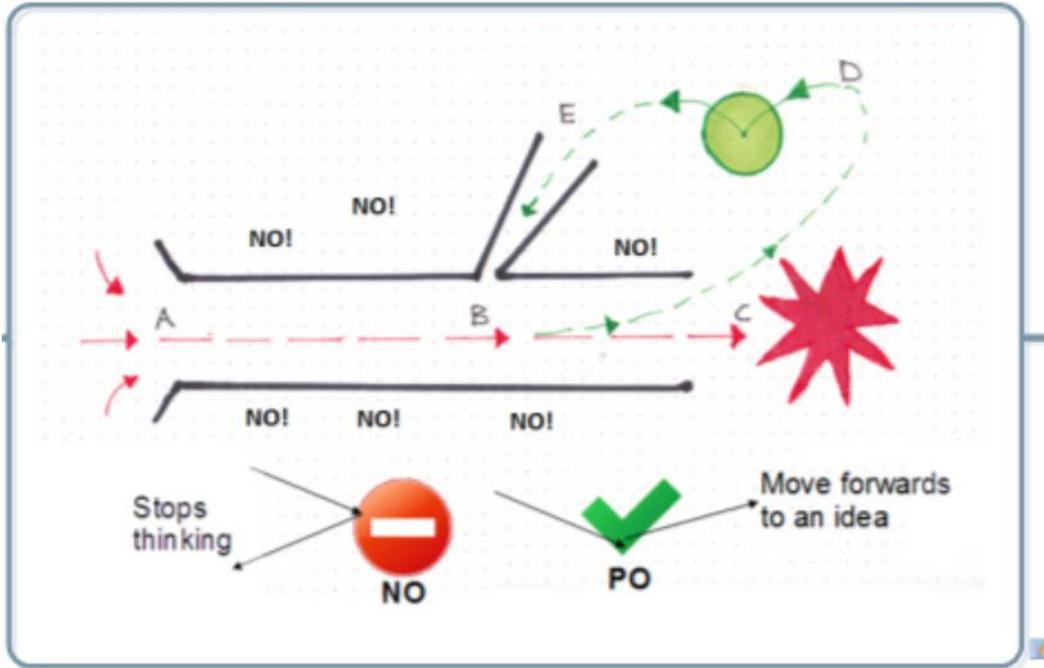
This is rational thinking, where any conclusion has to be derived in a number of logical steps from a plausible assumption, and based on evidence.

Bystanders are allowed to say NO anytime the thinker violates logical reasoning. In education critical thinking is encouraged.

There is a logical need to be not-logical in order to escape dominant thinking patterns.

A professor: can you here me in the back of the lecture hall? (Thinking pattern A->C: we are here to learn, and thus it is important that you can hear me)

Students: yes professor, we do, but it is not disturbing (Change of thinking pattern B→D→E: we are here in a social event)

Escape from Main Street Thinking

Escape from dominant thinking patterns are possible by setting up Provocative Operations.
1. Setting up the Provocative Operation
2. Moving forward to an new idea

There are hundreds of creative thinking techniques that can help to escape from compelling logic and in reaching a practical idea.
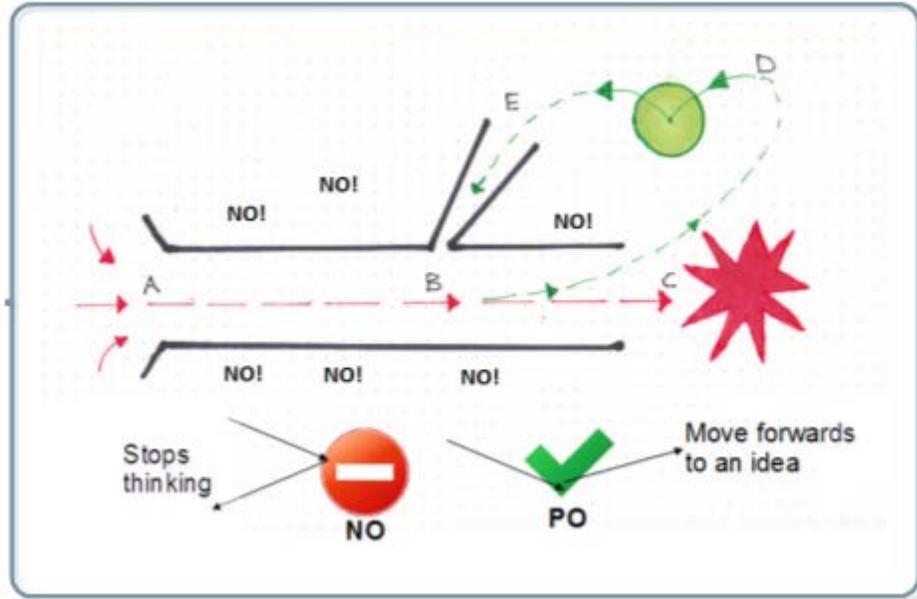
Creative thinking has the same structure as humor. In hindsight it is always logical. The time of the shift in perception is the Aha Erlebnis of the clou.

There are many possibilities to use creative thinking in business and science:
- Designing a Blue Ocean Strategy
- Shifting a Paradigm

Paradigm shift

Subtopic

Much more

NO PROBLEM

Blue Ocean Strategy

- *You don't have to pause in a body scanner, you can just walk to the gate while being body scanned.*
- *Female cars*
- *A bike that adapts to your age, from baby to elderly*
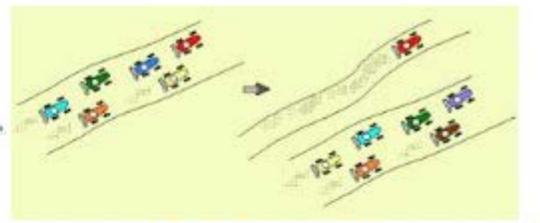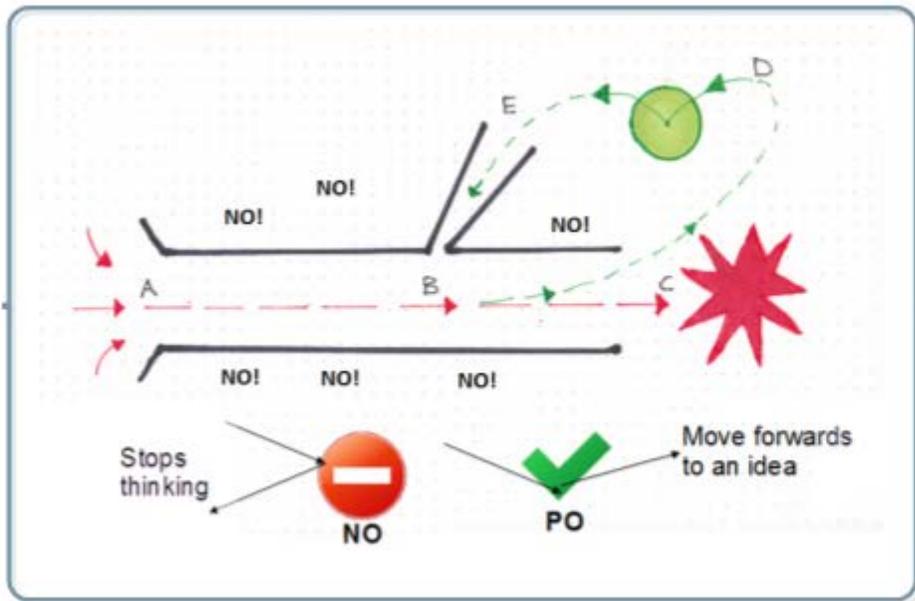- *A restaurant where you can dine with politicians*

Blue Ocean Strategy (B→D→E)

Make the competition completely irrelevant

The Red Ocean is red colored by the merciless fight between the competitors. They all run the same race. It is just surviving.

The Blue Ocean has the serenity of swimming alone, undisturbed. There is no competition, a compleet new market is created.

Paradigm Shift (B→D→E)

Become a Nobel prize winner

A paradigm shift (also radical theory change), a concept identified by the American physicist and philosopher Thomas Kuhn (1922–1996), is a fundamental change in the basic concepts and experimental practices of a scientific discipline.

Kuhn contrasted these shifts, which characterize a scientific revolution, to the activity of normal science, which he described as scientific work done within a prevailing framework (or paradigm).

The expert has become the emperor in the logic of his or her field of expertise; caught in a logic bubble and often unable to escape. This is where the curse of expertise comes in

In the 1800s, Dr. Ignaz Semmelweis discovered that washing hands with an antiseptic solution before a delivery reduced child-bed fever fatalities by 90%. The idea conflicted with both the existing medical concepts and more importantly, with the image that doctors had of themselves. The scorn and ridicule of doctors was so extreme – Doctors are gentlemen, and gentlemen's hands are clean – that Semmelweis moved from Vienna and was eventually committed to a mental asylum where he died.

Tycho Brahe, a Danish astronomer in 1575 and Johannes Keppler had the same data set. (Actually, Keppler stole it from Brahe). *Notwithstanding that was Kepler the first to state clearly that the way to understand the motion of the planets was in terms of some kind of force from the sun. Because he interpreted the data in a different way:* that the Earth was at rest, the sun went around the Earth and the planets all went around the sun

In 1982 Australian scientists discovered that gastric ulster were caused by a bacterium. Before that time it was assumed by the scientific community that gastric ulster must be caused by stress, and in any case not by a bacterium. Bacteria would not survive in the acid environment of the stomach.
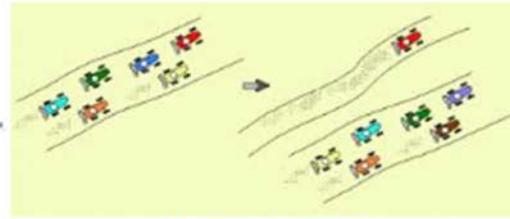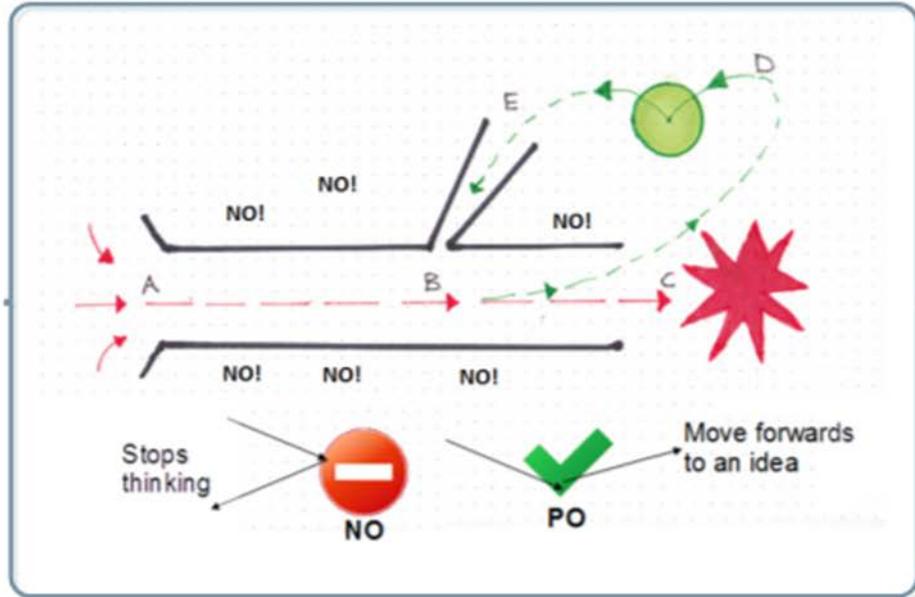
Blue Ocean Strategy

Paradigm shift

Subtopic

Much more

NO PROBLEM

Stops thinking — NO

Move forwards to an idea — PO

There are much more applications of creative thinking techniques

- **Law**. Law is typically based on stacking rules on laws on rules since the Roman Empire. Theoretically, there must be room for innovation.

- **Education**. Most educational theories are based on learning in classroom settings by young people

- **Psychology**. The easiest way to conduct research here is using the students, 20 years old, well educated. Thus of little general value.

- **Technology**. Many machines might be designed much more simpler, less costly, giving more value

- **No problem at all**. There is no perceived need to improve. There has never been made an attempt to design a new way of doing things, because the existing way satisfies.

What would happen to an aviation engineer that proposes that aircraft should land upside down to improve the view on the landinstrip?

What if he woud have announced his proposal with:
PO: aircraft should land upside down?

Escaping Thinking Patterns: PO!

Not "being logic" can have serious social repercussions.

There is a need for a social rule that encourages escape thinking and protect the offender.

PO is such a tool. PO stands for hyPOthesis, Poetry, Possibility.
It announces "This is a Provocation, I think we are caught in a standaard thinking, let's make an attempt to escape from it. Please, help.

And by the way, I am not mad.

There are several techniques for setting up a Provocative Operation
- Focus
- Taken for Granted
- The Utopia
- And many more

Focus: Where do you need better ideas? Write down at least 10. Choose one as your topic for this mini-workshop (problem, a thesis, a challenge, a research topic, a strategy, a business model, a policy, a task or …..something that is no problem at all)

Your topic:

Taken for Granted. Write down the normal way of doing things, at least 10. Choose the most common. Escape the taken for granted by removing it, amplify it, change it, etc.

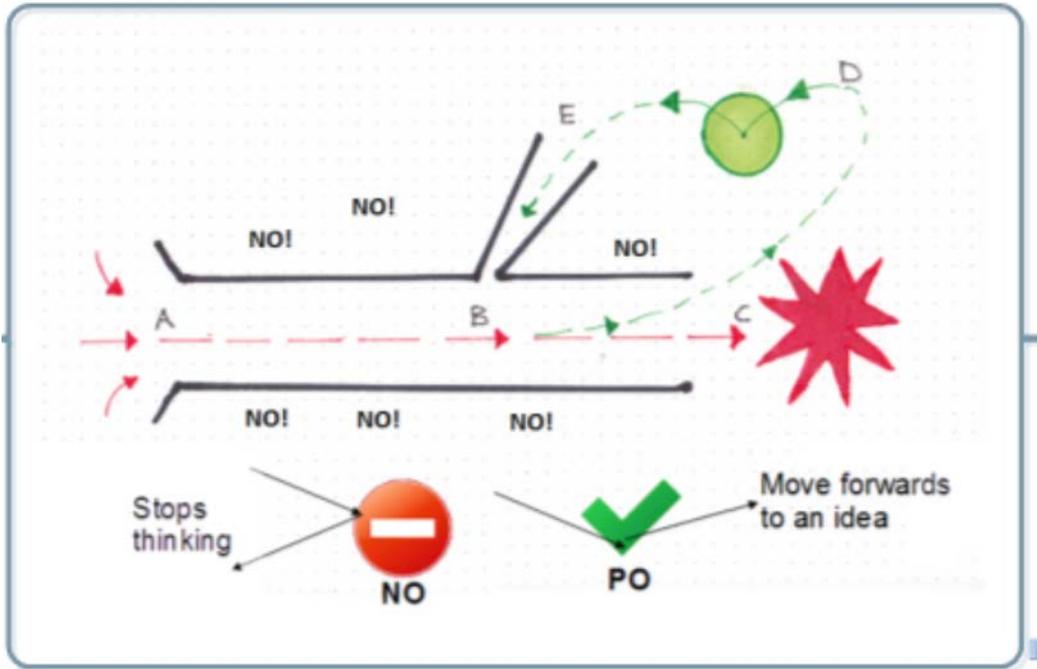|	

Idea:

Utopia. Describe the most ideal but by definition never to be reached situation. *Wouldn't it be fantastic if …* Then, think backwards. How did you reach that Ideal Situation?

Ideal situation:

Idea:

Some creative thinking techniques to deliberately escape from standard thinking

- Focus
- Taken for Granted
- Utopia

- Creative thinking is a skill. You have to practice it!

Ambidextrous Organizations

Organizations face the challenge to combine single loop learning (A→B→C) (Exploitation, doing things right) with Double loop Learning (A→B→D→E) (Exploring, doing the right things).

To comarrange structures and processes for both is key to succes in innovation. But it is not enough.

Skills to construct new concept and ideas,, systematically and deliberaty indispensable for organizations to become leaders through change.

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Gijs van Beeck Calkoen

Practice for Bold Thinking – *Creating Innovation with Teams*

Companies ask Gijs to work with their teams to create ideas for breakthrough innovations.

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