

RE

The Straits

Executive Appointments: TOLL

Eureka!

Approach a problem creatively and you can come up with innovative breakthroughs.

This real problem-solving case was published several years ago. Market research conducted by XYZ Photography Company showed that the main drawback of its automatic professional camera was the rollback time for films. Customers complained that 12 seconds was too long.

Since the problem was also common in competitors' cameras, finding a way to cut the time would give the company a big advantage. If you were a research and development engineer at XYZ, what kind of solution would you propose?

Like about 95 per cent of solutions generated from brainstorming sessions, your solution would fall into one of the following two groups:

- Type I solutions: A stronger motor (gear), longer film roll, shorter film roll, two rolls of film or two cameras.

- Type III solutions: A digital camera, a Polaroid camera, cartridge-based film or cyclic film.

The solution that XYZ ultimately chose, however, was far more creative and cost effective than any of these. In fact, it was a solution you probably could have thought of but didn't. Why not?

Due to unconscious instincts, people tend to automatically perceive all problems as threats. We deal spontaneously with threats by either fighting them or running away from them. In this way, "spontaneous" problem solvers unwittingly conceive of one of two kinds of "brute force" solutions:

- Type I solutions (fight): These "more of the same" solutions are characterised by

making a change within the system's parameters in order to minimise the negative effect (the problem). In the camera example, the stronger motor suggestion is the most typical example of this type of solutions, with the underlying assumption being that there will always be a strong enough motor to roll the film back as quickly as needed.

- Type III solutions (flight): These "concept change" solutions are characterised by revising the entire concept of the system in order to avoid the negative effect. The most typical solution of this type is the digital camera: No film, therefore no rollback time.

Usually, Type I and Type III solutions are not considered particularly creative since there is no sense of "energy gain". While the Type III solution (the digital camera) completely solves the problem, changing the system is a very costly means of solving problems. You get a lot but you pay a lot.

The Type I solution (a stronger motor) is not very costly but neither is it a complete solution. After all, the size of a stronger motor is limited by inherent constraints within the original system. In other words, you don't pay much but you don't get much.

Cost-effective inventive solutions

A truly creative solution is one that completely solves the problem but is cheap to implement — a "free lunch" Type II solution. This leads us to one of Systematic Inventive Thinking's (SIT) most important principles, namely the paradoxical approach to problem solving.

Essentially, in order to find a very cost-effective creative solution, one should seek

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within the system. Such closed-world solutions should not be costly but should make a qualitative change. Paradoxical solutions actually change the system without changing the system.

One of the most promising ways to solve the paradox and arrive at Type II solutions is to harness the problem's drawback (or negative effect) to overcome it, much in the way that judo trains its practitioners to use the enemy's power to defeat him.

If we return to the camera example, the negative effect is its rollback time. Instead of fighting this with a stronger motor or bypassing it by switching to a digital camera, the inventive approach encourages us to look for solutions which make use of the rollback time.

For example, could we take pictures while the film is rolling back, or backwards from the end of the roll to the beginning? What

about taking pictures in both directions?

The solution XYZ adopted was a closed-world solution with a qualitative change. The normal film progression was changed to a double step in both directions: First, the camera takes pictures on the odd frames (1, 3, 5...), and then rolls backwards, taking pictures on the even frames (36, 34...) and ending at the start of the roll, ready to be ejected and replaced with a new roll of film.

As the camera example illustrates, SIT problem solving is based on analysing the problematic system, understanding its inherent contradictions, defining the negative effects and searching for qualitative change solutions within the closed world of the problem.

By virtue of going against the grain of the instinctive thinking process, this kind of problem solving leads to a high probability of success.

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