

**OTSM-TRIZ as a Response to the Request
from the Specialized and Interdisciplinary Problem Situations**

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Main Thinking Models and Tools of OTSM



OTSM : General Theory of Powerful Thinking

OTSM was originated by G. Altshuller.

Current research of OTSM has been done mainly by Nikolai Khomenko.

- *8 Axioms (with 3 postulates of Classical TRIZ)*
- *'ENV model ' Including 'Advanced Multi Screen Thinking'*
- *Hill Model, Tongs Model, and Funnel Model*
- *4 Technologies with all of classical TRIZ tools :*
Typical, Contradiction, Problem Flow and New Problem Technologies
- *Problem Flow Networks Approach*
Including Networks of Problems, Contradictions and Parameters

Purposes of PFN



- *Problem Flow Networks Approach*
Including Networks of Problems, Contradictions and Parameters

Are we happy with tools of Classical TRIZ ?

* The below explanation is from Valeri Souchkov's 'TRIZ Success Cases'

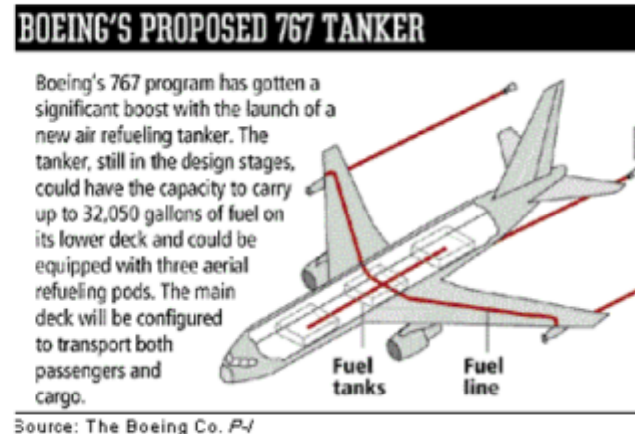
Boeing 767 refueling system by Boeing

TRIZ helped to develop a new refueling system for Boeing 767 aircraft, which resulted in extra sales of 1.5 billion US dollars.

"A TRIZ workshop solution was developed for the 767 Tanker (air-to-air refueling) aircraft project. As a result of that TRIZ solution, the program was successfully launched with a customer who preferred the TRIZ solution over the competitions solution for the same system, thereby ordering aircraft from Boeing. "

Don Masingale

*Advanced Research Engineering Program Manager,
Boeing, USA*



Crest Whitestrips by Procter & Gamble

"TRIZ was used to develop Crest Whitestrips™ for Procter & Gamble (P&G). From a TRIZ perspective, the key problem was that tooth whitener should be on the teeth to bleach, and it should not be on the teeth to avoid contact with saliva. A TRIZ concept, a thin flexible film saturated with whitener that selectively adhered to teeth, proved to be the answer. Whitestrips was P&G's most successful product launch ever, generating \$130 million dollars of sales in the first year of operation while capturing over 45% of the whitening market."

Larry R. Smith

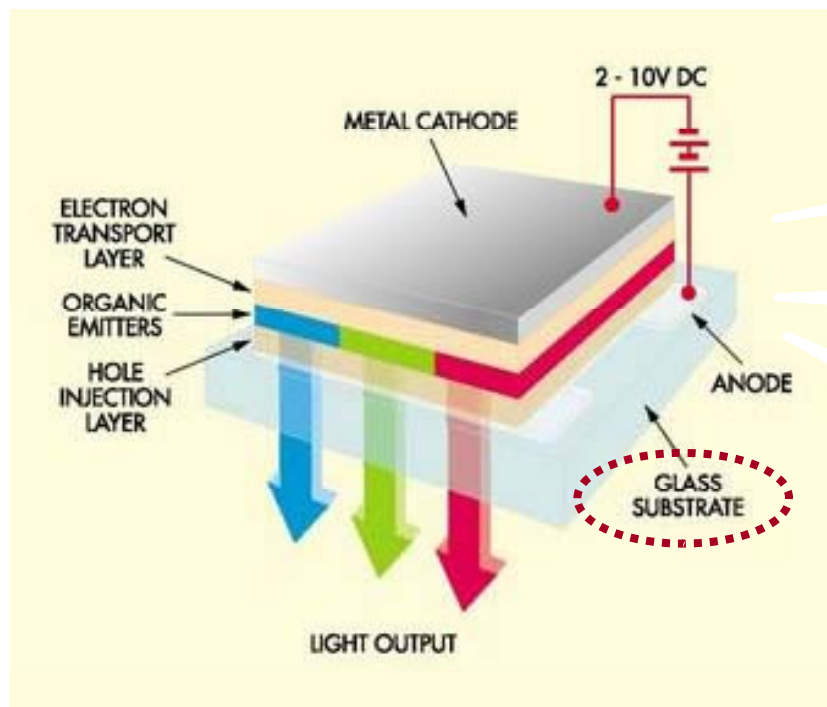
President, Altshuller Institute for TRIZ Studies, Inc, USA



Are we happy with tools of Classical TRIZ ?

Classical TRIZ tools for idea generation are productive when the target objects are simple and obvious.

How to reduce the deformation of the glass substrate during transportation ?



40 Principles ?

Inventive Standards ?

Pointers to Effects ?

Are we happy with tools of Classical TRIZ ?

On the other hand, if the target object is a complex system, classical TRIZ tools for idea generation don't seem to be applicable.

How to improve the brightness of this OLED displayer ?



40 Principles ?

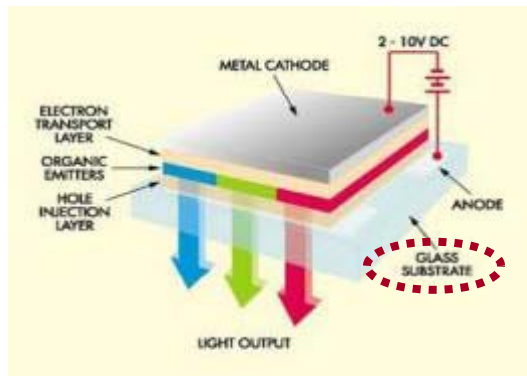
Inventive Standards ?

Pointers to Effects ?

A classification of problems for TRIZ applicability

It was proposed that we could classify problems into simple and complex ones 'based on our experience'

*One of simple problems
which could be directly dealt
with classical TRIZ tools*

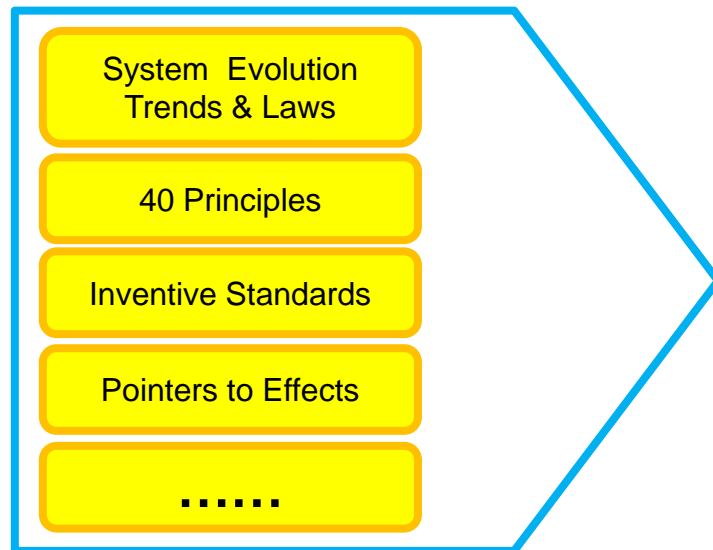


*One of complex problems
which seem to need some transformation
for direct application of TRIZ tools*



Two main streams of development of classical TRIZ

G. Altshuller developed the classical TRIZ in two main streams.
One is a set of idea generation tools for inventive problem solving.
The other is a thinking process for solving a problem which could be complex.



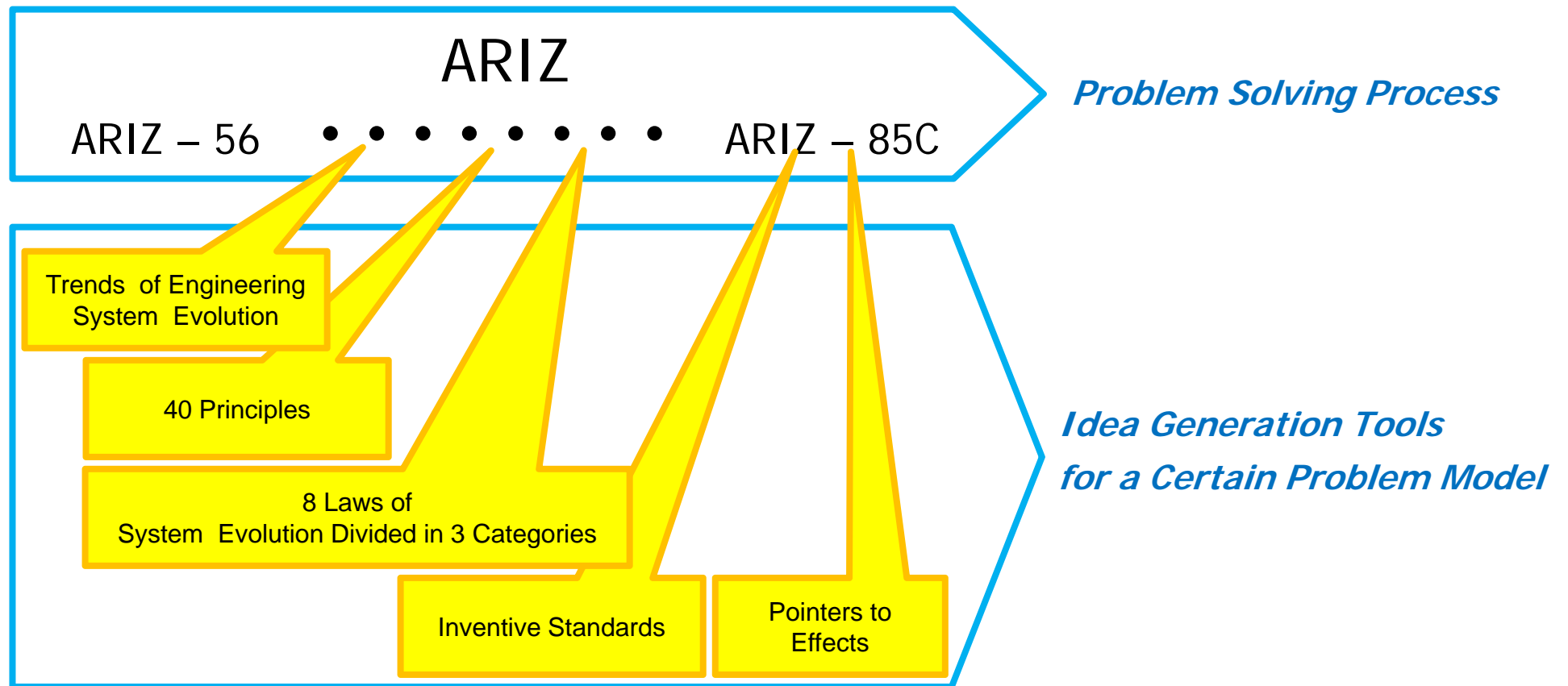
***Idea Generation Tools
for the Problems That Seems
Simple Non-typical Problems to Solvers
But Can Be Reformulated to Typical Ones
from TRIZ Viewpoint***



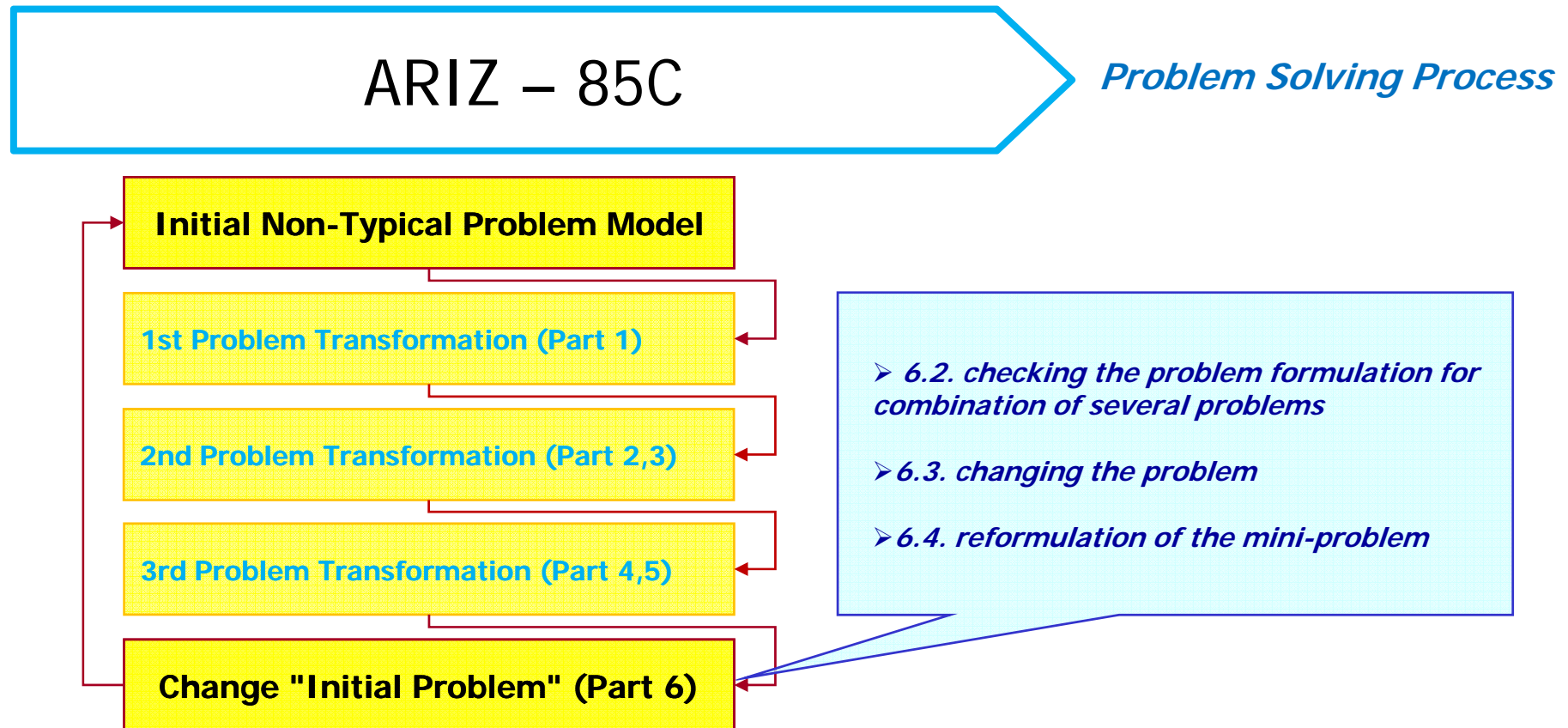
***A Problem Solving Process
for a Highly-nontypical Problem Model
Which Might Be Complex***

Two main streams of development of classical TRIZ

From historical viewpoint, idea generation tools of TRIZ had been introduced to improve the practical efficiency of ARIZ



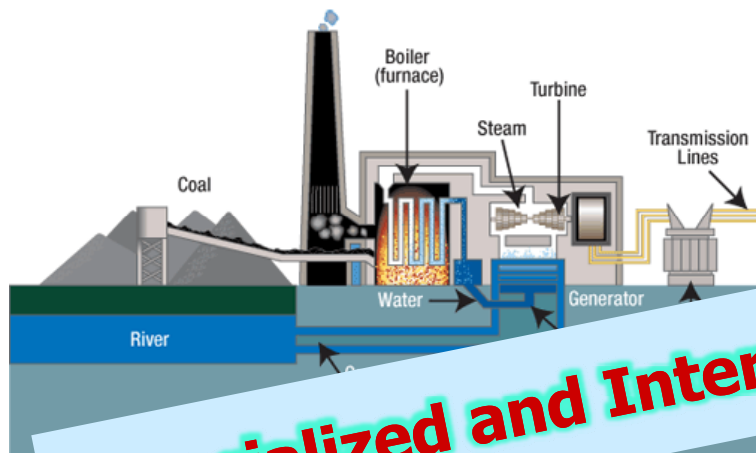
How to deal with a complex problem in ARIZ-85C



Complexity beyond coverage of ARIZ

How to improve
the efficiency of a power plant

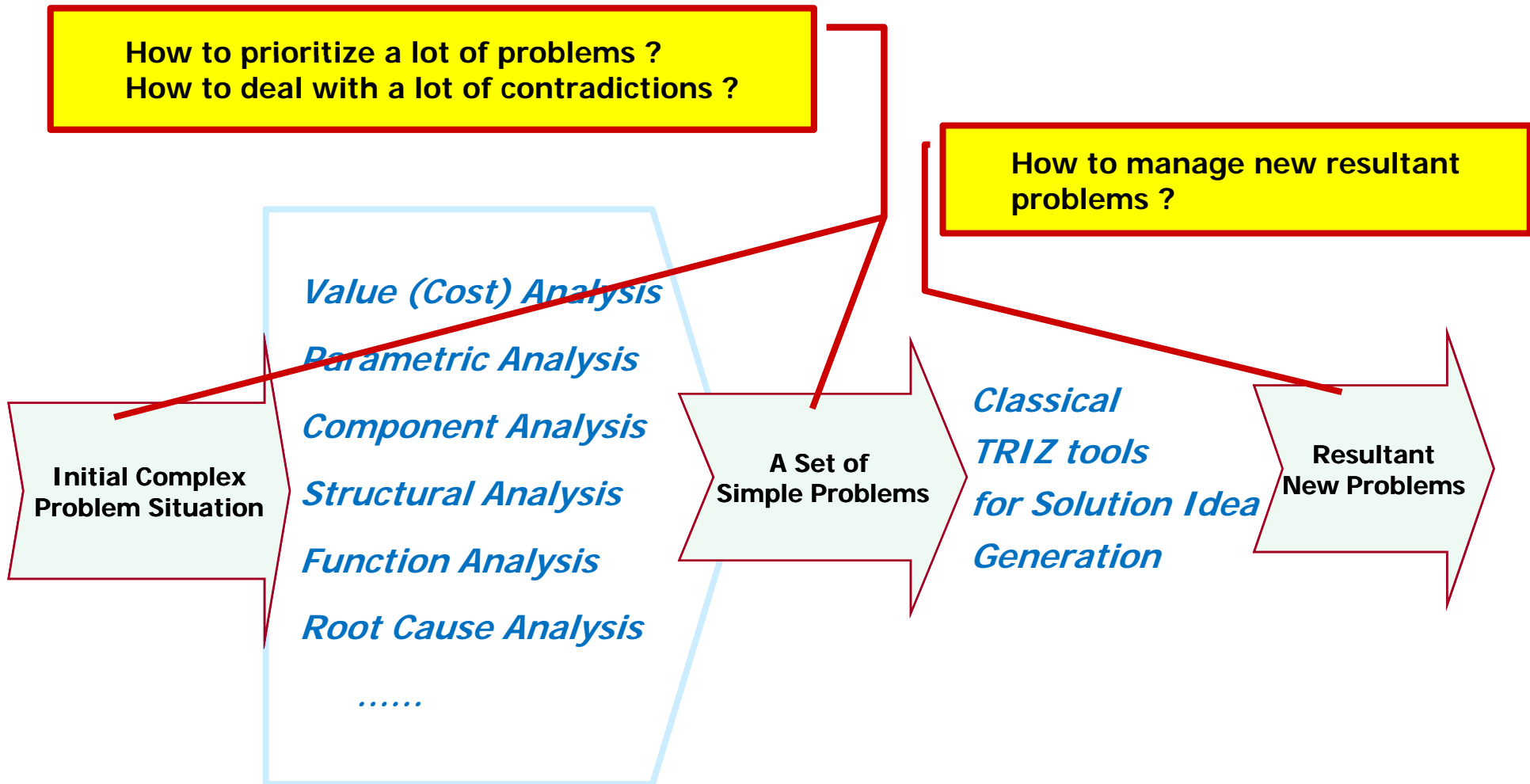
How to improve
the yield of a semiconductor plant



Specialized and Interdisciplinary Problem Situations



Limit of modern ways to deal with complex problems



OTSM viewpoints proposed by Nikolai Khomenko

How to prioritize a lot of problems ?
How to manage new resultant problems ?



Nikolai Khomenko

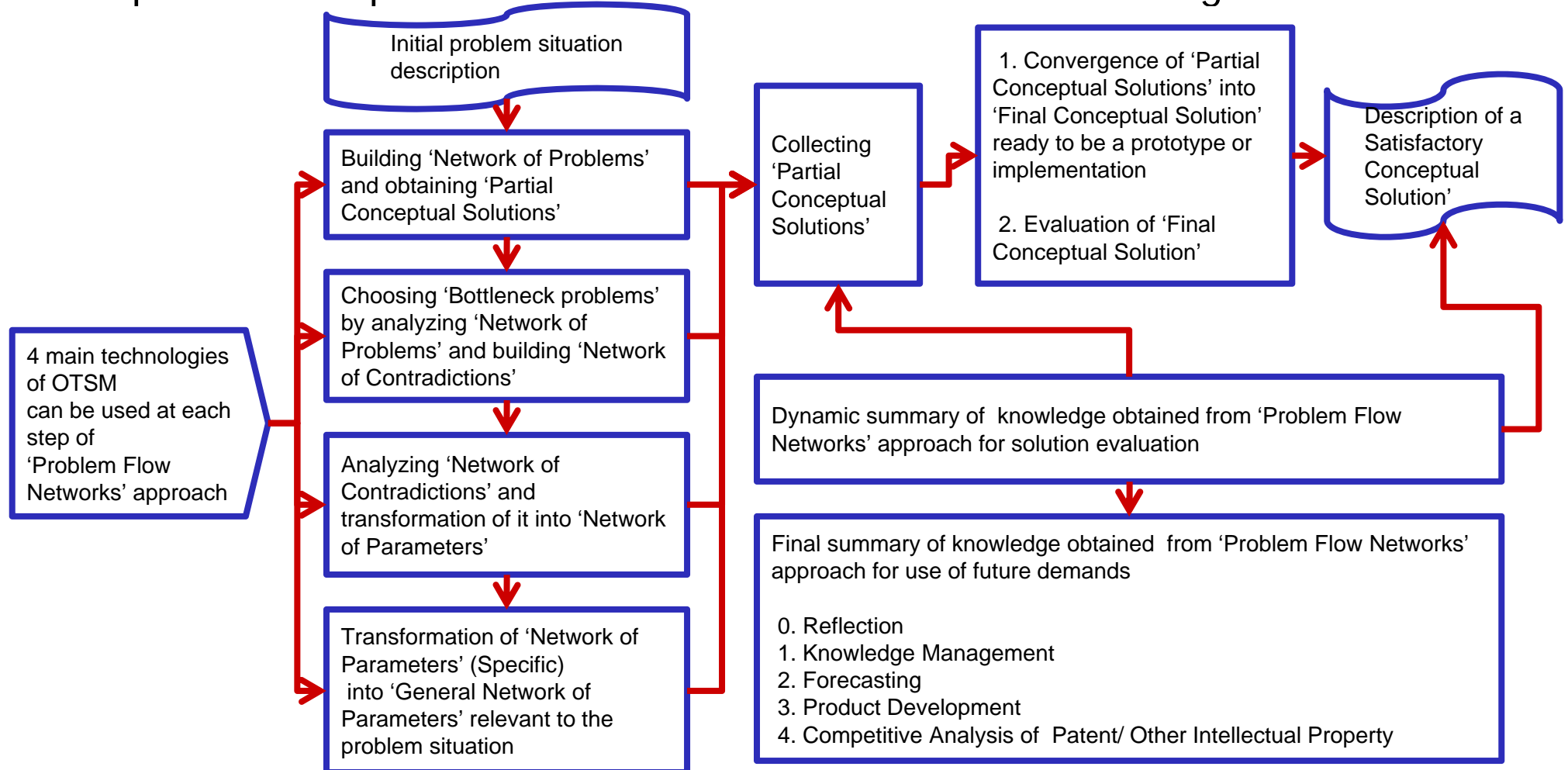
A complex problematic situation is
NOT a set composed of individual problems,
BUT a network of problems according to their relationship
from ENV viewpoint of OTSM

How to deal with a lot of contradictions ?

A complex problematic situation is
NOT a set composed of individual contradictions,
BUT a network of contradictions according to their relationship
from ENV viewpoint of OTSM

Problem Flow Networks Approach of OTSM

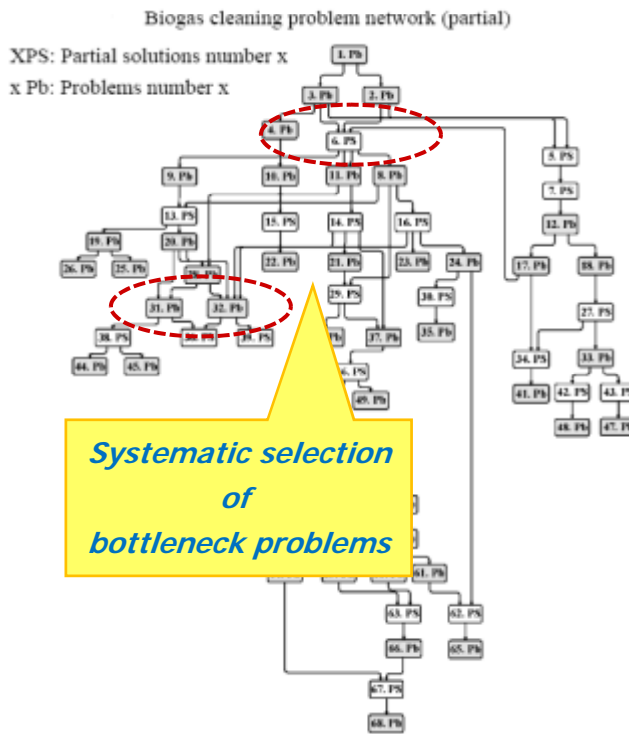
Like ARIZ in Classical TRIZ, Problem Flow Networks Approach of OTSM provides the process to narrow down the solution searching zone



Networks of Problems, Contradictions and Parameters

Each network provides systematic guides to deep understanding the core of the problems

Network of Problems



Overview of systematic selection at each stage

Network of Problems

- **Bottlenecks**



Partial Solutions

Network of Contradictions

- **Elements**
which are mostly related
to contradictions

Partial Solutions

Network of Parameters

- **Parameters**
which are mostly responsible
for other parameters

Partial Solutions

Narrowing Research Area without Losing Quality of the Satisfactory Solution

Summary

- *Idea generation tools of Classical TRIZ are not ready to apply to complex problems and need some additional analytical tools in order to manage complex problematic situation efficiently and effectively .
To narrow research area without losing quality of the solutions , we need a systematic way to integrate all partial solutions to every subproblem.*
- *Like ARIZ in Classical TRIZ, a general thinking approach is needed to transform the complex problem situation into a system of key problems and prioritize them for effective solving process.*
- *Unlike to other modern analytic ways in TRIZ field, the problem flow networks approach (PFN) of OTSM suggests systematic way to reduce the solution searching area and deepen the understanding the core of the problem situation.*

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