

Contemporary Issues of TRIZ to be a Scientific Method

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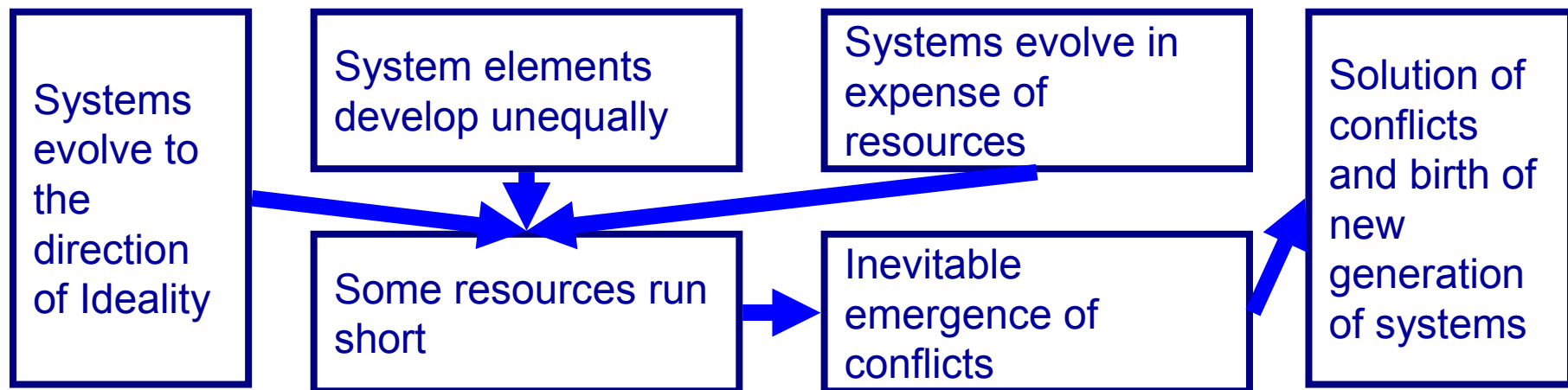
About the word “Scientific”

- If there is a principle and you can find infinite number of events that correspond with it, the principle is called Scientific. (A definition based on the idea of Martin Heidegger)
- Ex. Neptune was found on the basis of calculations in accordance with Newtonian mechanics. (The principle that was applicable to all other planets led to the discovery of another planet.)

Issue 1: The TRIZ fundamental postulates

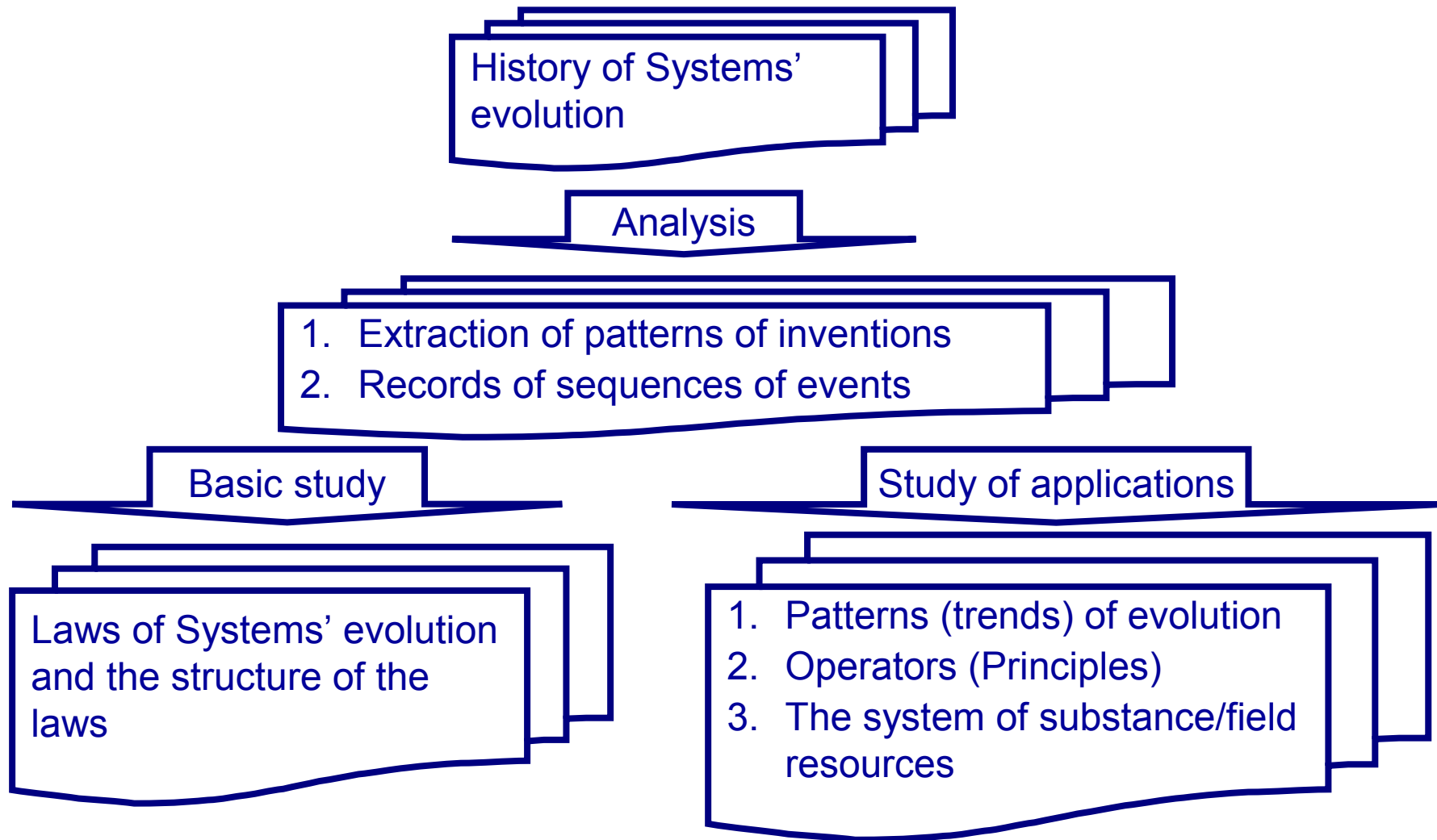
- I. Technological systems evolve in accordance with objective laws.
- II. The laws can be used for the purposes to solve new technological problems in a systematic manner.

Example of the laws :



- Importance of the postulates is underestimated.

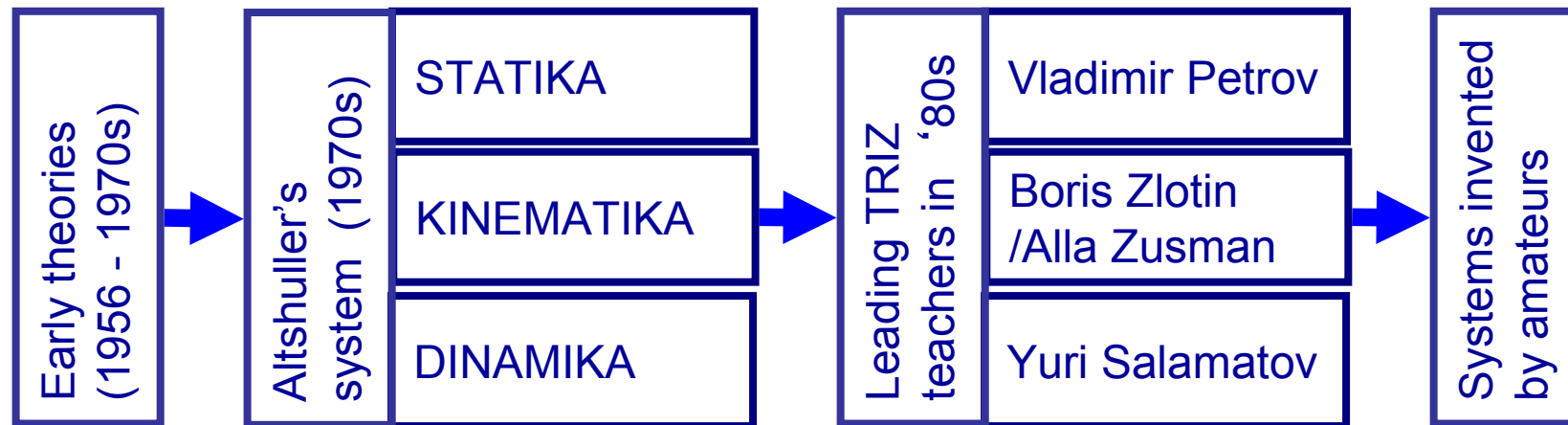
Logics of TRIZ studies



Issue 2: Laws of Systems' evolution

- G. Hegel ⇒ K. Marx/F. Engels + C. Darwin = Evolutionist approach to systems history
- Variations of empirically-defined laws before TRIZ
- Altshuller put the foundation for scientific theory of Systems' evolution.

Development of TRIZ system of laws:

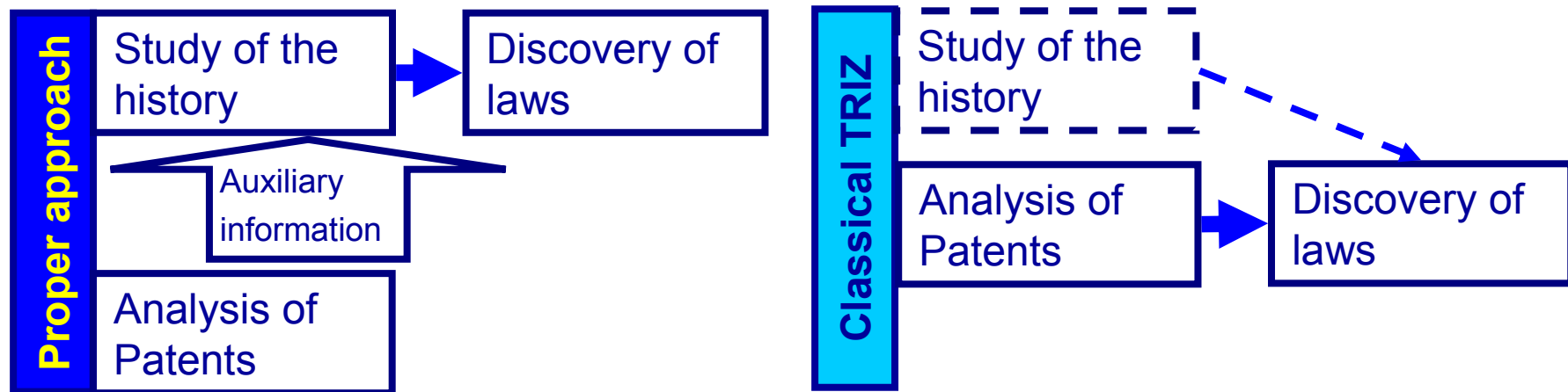


- **Absence of open constructive discussions**

Issue 3: Methodology of studies

- We are talking about the evolution of the systems which are used by people.
- Proper object of TRIZ studies should be systems in the communities. (Not the systems that were conceived and recorded in patent documents.)
- Patent documents should be only auxiliary materials to fill gaps of the history.

Stumbling block for early TRIZ:



- Analysis of patents are easy to execute and it led to many interesting discoveries which witness tendencies of human psychology but do not necessarily reflect laws of Systems' evolution.

Issue 4: Illusion of a panacea

- The second part of TRIZ postulate led TRIZ to this misunderstanding. “If you know laws of evolution you can solve any problems.”
- It was a Marxist simplification of the History.

Gödel's first incompleteness theorem

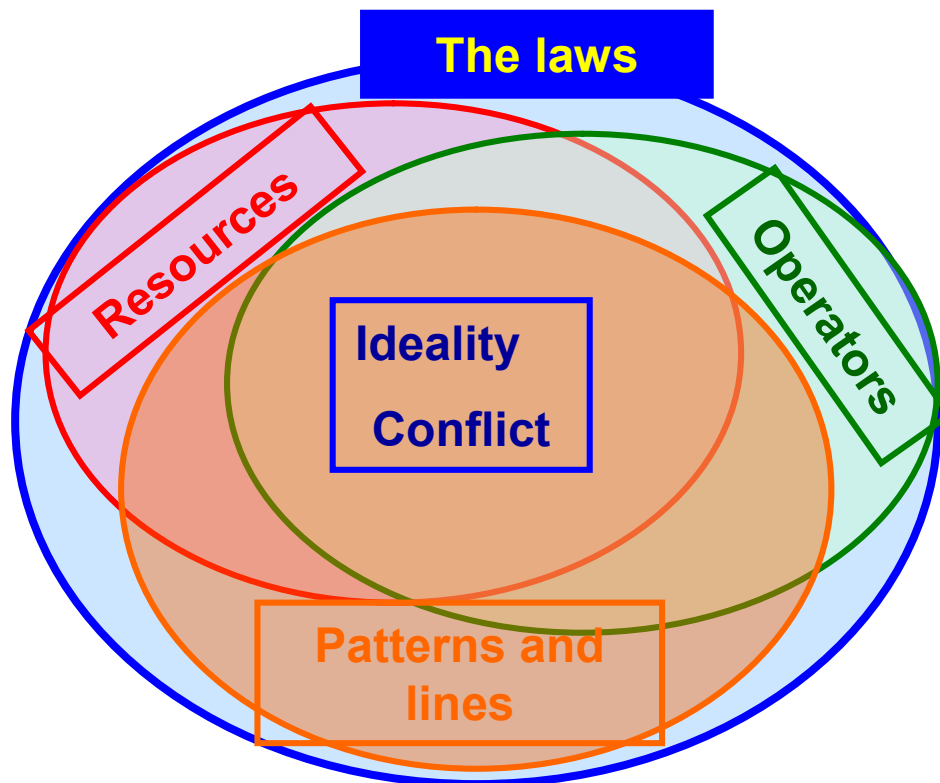
There are problems that can not be solved by using TRIZ in the space of problems which are conceivable under TRIZ assumptions.

- TRIZ is a product of the history and not its creator although TRIZ can sometimes facilitate the course of the history.
- Searches for an all-round algorithm are destined to fail. (Efforts to improve useful tools are valuable.)

Issue 5: Basic tools

- We use the words “basic tools” for the tools which have been developed directly from the laws of Systems’ evolution in order to distinguish them from other tools which are used for practical applications of the laws.

A model of the structure of the basic tools



- Tools of the Classical TRIZ are accumulated products through its history. They do not make anything like an entity.
- The system of TRIZ basic tools is still to be constructed.

Issues 6: Functional analysis (one of the TRIZ auxiliary tools.)

- S=F analysis was made to analyze an elemental function. It does not fit for analysis of functional structures of a complicated system because it does not show INPUT/OUTPUT relations between functions.
- There were efforts to adopt ideas of Value Analysis from late '70s to '80s but they were not properly digested by the TRIZ community.

A tool for analysis of functional structure is a must for practical applications of TRIZ. S=F=S structures reflect the present physical structures (in the box structures), which limit the out of the box thinking.

- Aren't there the "Not invented here" symptoms in the TRIZ community?

Issue 7: Wider needs for TRIZ applications

- There are 4 basic needs;
 - Introduction and/or improvement of functions
 - Root cause analysis
 - Prediction of risks
 - Identification of opportunities
- Classical TRIZ did not see needs other than “Introduction and/or improvement of functions”.
- TRIZ should and could be a general tool for different types of problem solving.
- Isn't there a tendency that keeps TRIZ to be a tool of the trade?

Issue 8: TRIZ dissemination

1. Who are the beneficiaries of TRIZ?
 - Think “who are the beneficiaries of physics?”
2. TRIZ is difficult to learn!
 - Is physics difficult to learn?
 - There is a need to improve the system of TRIZ education
 - Teach TRIZ part by part, for example!
 - Ideality/Conflicts → Operators → Resources → Laws
3. Difficulties to gain consent of the management!
 - Let them use TRIZ!
4. They do not understand TRIZ!
 - *Do you understand it yourself?*

Thanks!