

Promoting TRIZ in Italian SMEs: models and implementing experiences

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**TRIZ Future conference 2010
Bergamo**

- ☞ Center of Competence
- ☞ Suggested Model
- ☞ Main experiences
- ☞ Results & Future Perspectives

Center of competence for Systematic Innovation



The **Center of competence for Systematic Innovation** gathers university professors and researchers in order to investigate, promote and offer knowledge on TRIZ theory and methods for technological innovation to enterprises, institutes and individuals.

Actors:

- Alintec (*coordinator*)
- Politecnico di Milano
- University of Bergamo
- University of Florence
- PIN Scrl, Didactic and Scientific Services for University of Florence
- Ceris-CNR of Turin
- AREA Science Park of Trieste
- Business Development Management of Turin

The screenshot shows the website for the Center of Competence for Systematic Innovation. The header includes the logo and a search bar. The navigation menu lists: Home, Centro di competenza, Servizi, Triz & innovazione sistemtica, Documenti, News e Eventi, and Contatti. The main content area is titled 'Centro di competenza per l'Innovazione Sistemtica' and contains the following text: 'Il Centro di competenza per l'Innovazione Sistemtica riunisce docenti, ricercatori universitari ed esperti al fine di approfondire, diffondere e offrire conoscenze su TRIZ e sull'innovazione tecnologica a imprese, enti e persone singole.' Below this, it states: 'TRIZ è la Teoria per la Soluzione Inventiva di Problemi, ovvero una teoria e un insieme di metodi e tecniche indicate per risolvere problemi non ordinari, nell'ambito delle attività di sviluppo di nuovi prodotti, processi e servizi.' There is also a section for 'Partecipa al seminario di presentazione della Tesista TRIZ' on May 4, 2010, at 9:30 AM in Milan. The 'In evidenza' section on the right highlights a presentation in Milan on November 3-5, 2010.

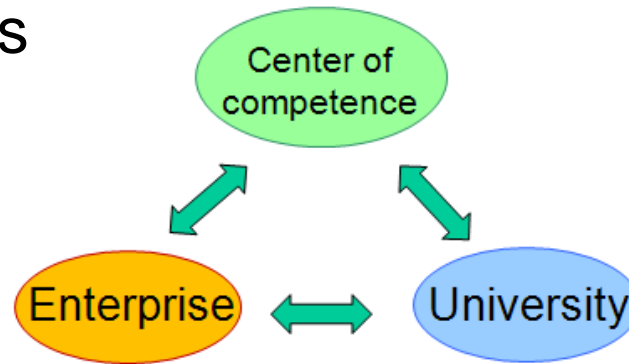
www.innovazionesistemtica.it

- ✗ Italian Industry
 - Mainly craft, small and medium enterprises

- ✗ Today market conditions
 - To deal with complex and multidisciplinary problems;
 - To define technical characteristics for products in shorter and shorter times;
 - To make forecast much more realistic and in shorter times;
 - To generate solution concepts for new products in programmable times.

- ✗ Intrinsic aspects of TRIZ theory
 - Learning time is not short;
 - Considerable jump of mentality;
 - Variety of tools and techniques;

❖ Proposed models



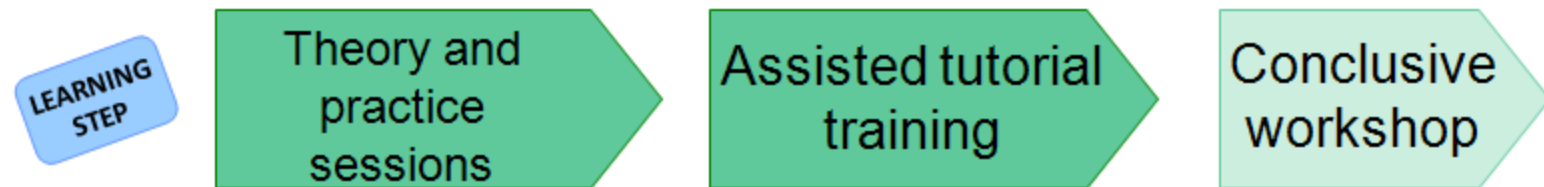
❖ Proposed learning path

- Different steps of acquaintance and learning

❖ Contents

- TRIZ Theory fundamental concepts (*without simplification*);
- Intellectual property bases;

❖ Proposed organization



Past experiences – Main Projects



❖ TRIZ – Systematic Innovation for Lombard SMEs

Financed by Lombardy Region (Action D4);
In collaboration with the province of Milan and Formamec
Autumn 2005 - Autumn 2006

- CARLO BANFI spa – Control valve for shotblast machine
- CARLO RAIMONDI spa – Tower crane for building
- OMSG spa – Shotblast machines
- POMPE TRAVAINI spa – Liquid ring vacuum pump
- PREFER spa – Pin tumbler lock
- RECUPERATOR srl – Rotating air exchanger
- RT VALVOLE INDUSTRIALI – Process for material deposition
- SCAM srl – Connecting rod for endothermic engines
- TURBOTECNICA srl – Blasting installations



❖ TRIZ – Systematic innovation in Trentine crafts enterprises | 1st edition

Financed by Independent Province of Trento - Assessorship of Crafts;
In collaboration with Cei Trentino – Winter 2007 - Summer 2008

- CIMADON – Air box and air filter for cars
- GECELE – Domestic rubbish compactor
- LASAR srl – Stone protection barrier
- MAURO BARBERI STUFE srl – Heat storage stoves;
- MEC srl – Machines for cutting stones;



Past experiences – Main Projects



❖ TRIZ for Trentine crafts enterprises | 2nd edition

Financed by Independent Province of Trento- Assessorship of Crafts;
In collaboration with Ceii Trentino – Winter 2009 - Summer 2010

- CONSORZIO ARTIGIANO DEL PORFIDO – Machine for sorting stones
- FESTI ALFEO srl- Armored doors
- GIANMOENA MARMI srl – Granite and marble manufacturing
- MAURO BARBERI STUFE srl – Heat storage stoves;
- MEC srl – Machines for cutting stones;
- MIE – System for enhancing rescue on cableways ;
- PUBLIGARDA – Machine for removing snow from roof;
- PROGETTO LEGNO snc–Wooden building Manufacturing
- TAMANINI HYDROS srl– Realization of hydraulic turbines



Conditions to participate to above mentioned projects:

- Enterprises were selected through a public competition;
Selection criteria to the submitted proposals:
 - adequacy of the technical proposal to be faced with TRIZ tools;
 - level of novelty of the technical proposal;
 - consistency between technical proposal and manufacturing resources of target participant;
 - clearness and completeness of the proposal;
 - improvements on local conditions.
- Winner enterprises should agree to diffuse and publish main project results

Past experiences – Example

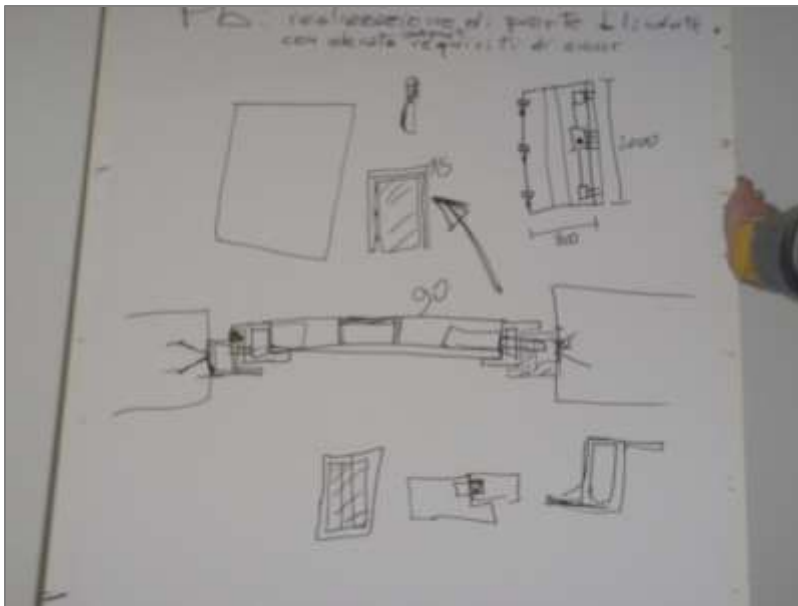
Example of assisted Tutorial Training on Case Study: *FESTI srl- Armored doors* from Project “TRIZ for Trentin crafts enterprises - 2nd edition



1) Comprehension of the technical problem and preliminary patent analysis;

System in analysis: Craftmade steel armored door for 3rd security class; weight: ~100kg; 3 ÷ 4 workers are involved during the transport in buildings;

Problem to face: Reduce number of workers involved in transportation
How to facilitate the transport of the armored door involving only two workers?
Is it possible to develop a *light steel armored door* with the same security class?



~0h

4h



assisted tutorial training

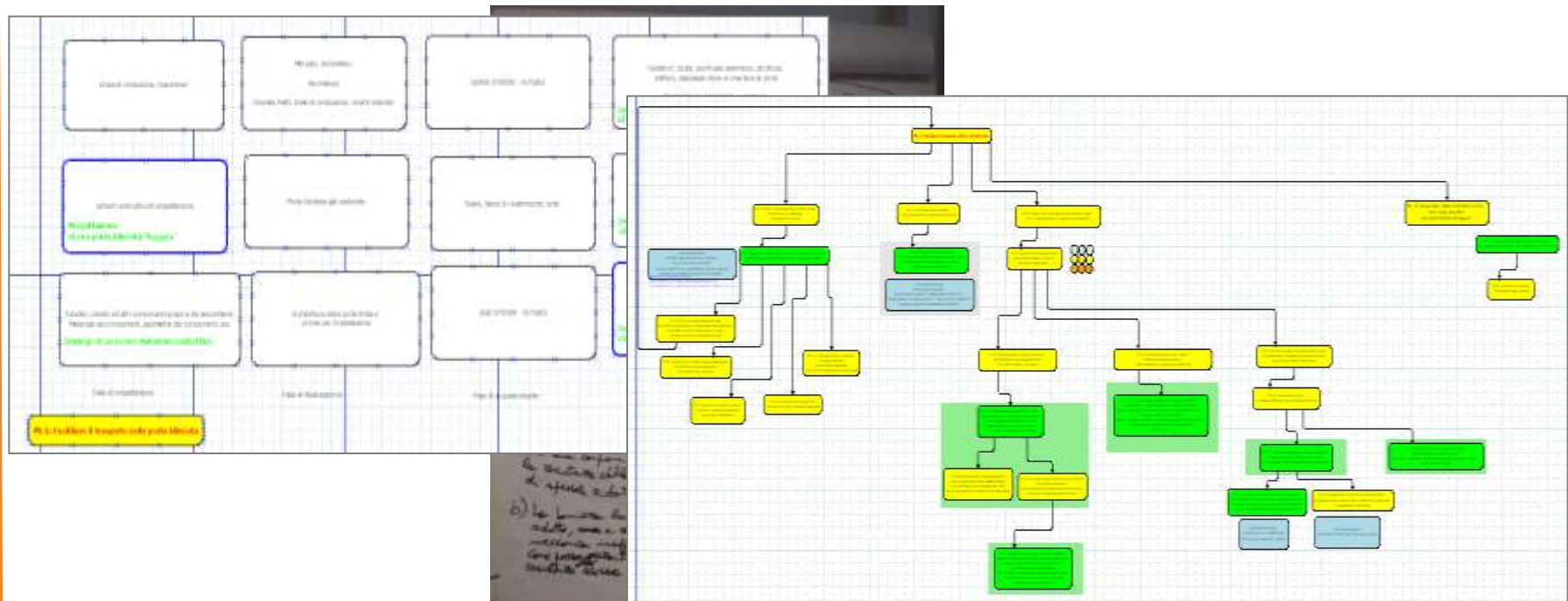
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Past experiences – Example



Example of assisted Tutorial Training on Case Study: *FESTI srl- Armored doors* from Project “TRIZ for Trentin crafts enterprises - 2nd edition

- 1) Comprehension of the technical problem and preliminary patent analysis;
- 2) Preliminary analysis of the System with Multiscreen technique, problem identification and reformulation of the original problem;
- 3) Problem Analysis: Network of Problems (*), problem reformulation through Multiscreen approach, formulation of preliminary solution concepts;



~0h

4h

6h

assisted tutorial training

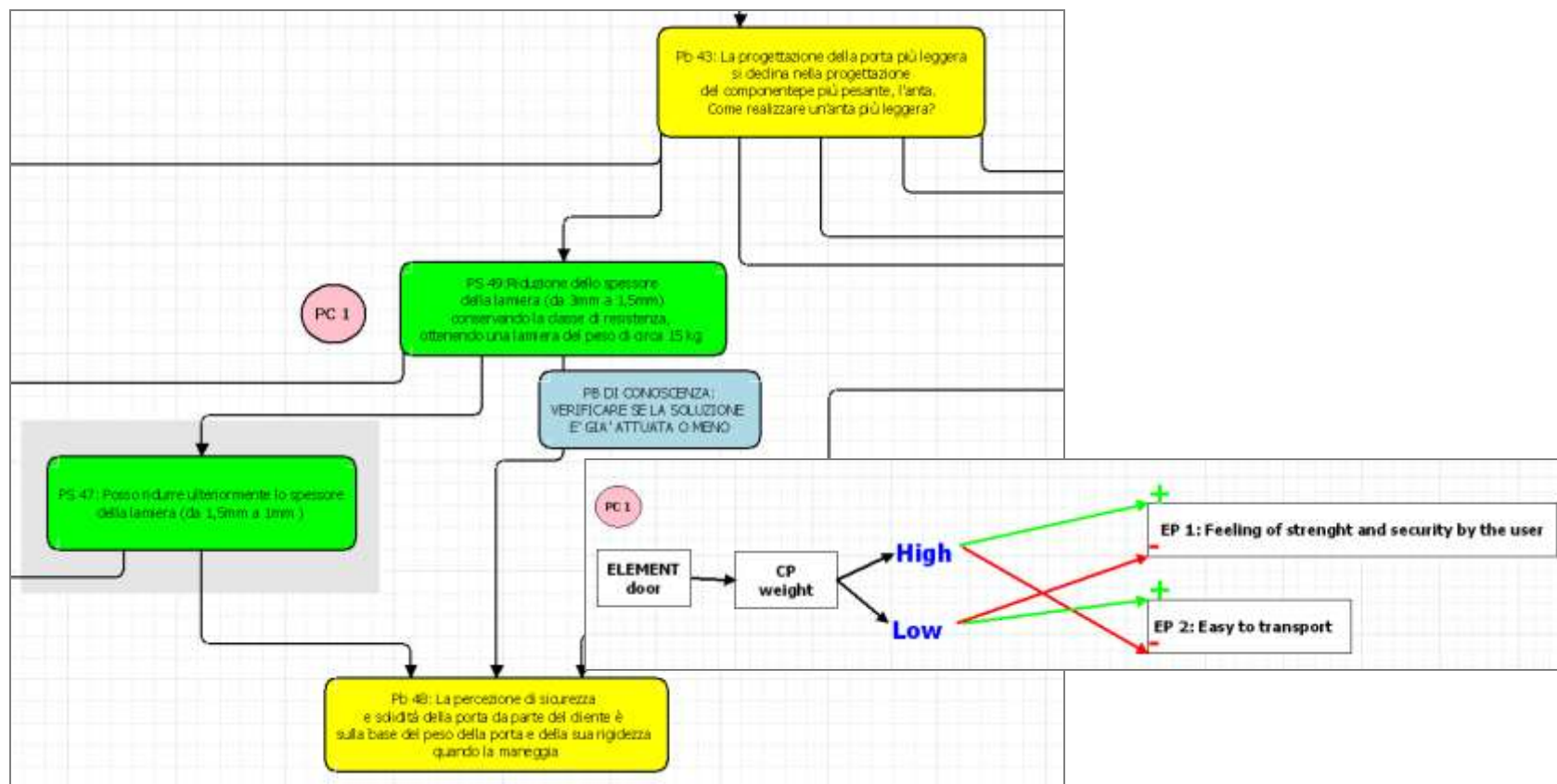
review

Past experiences – Example

Example of assisted Tutorial Training on Case Study: *FESTI srl- Armored doors* from Project “TRIZ for Trentin crafts enterprises - 2nd edition



4) Problem Analysis: identification of conflicts and modelization (contradictions, basic Su Field);



~0h

4h

6h

10h

assisted tutorial training

review

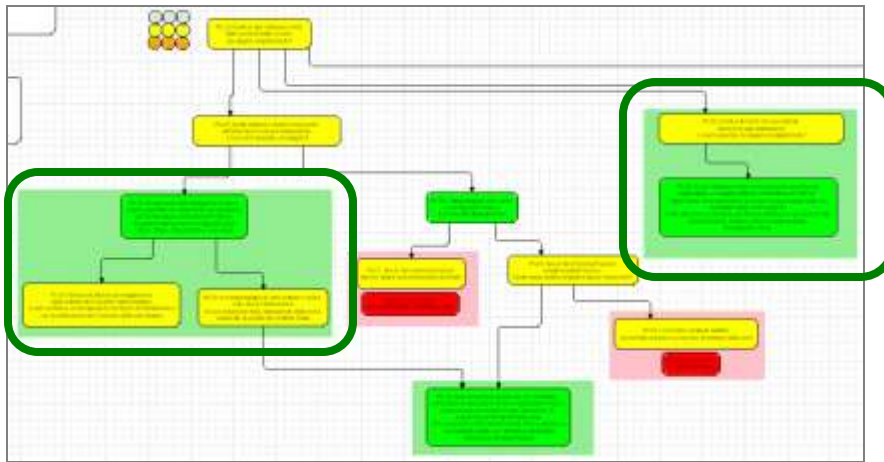
assisted tutorial training

Past experiences – Example

Example of assisted Tutorial Training on Case Study: *FESTI srl- Armored doors* from Project “TRIZ for Trentin crafts enterprises - 2nd edition



- 4) Problem Analysis: identification of conflicts and modelization (contradictions, basic Su Fields modelling);
- 5) Resolution of main conflicts (Separation Strategies; main Standards) and Resources analysis;
- 6) Ranking of proposed solution concepts.



PS 26: Door made by three pre- assembled parts (frame 35kg, reinforcement 30kg, covering 15kg). 2 workers are involved in transportation

		CONSTRAINTS (1-2)	SELECTION CRITERIA (1-2)	TOTAL
A	PS 6:	0	1	1
B	PS 12:	1	2	3
C	PS 17:	2	2	4
D	PS 24:	1	1	2
E	PS 26:	2	2	4
F	PS 39:	0	2	2
G	PS 37:	1	1,5	2,5
H	PS 34:	1	0,5	1,5
I	PS 40:	1	0,5	1,5

~0h

4h

6h

10h

12h

assisted tutorial training

review

assisted tutorial training

end review

Practical results:

- For every case study almost ten innovative solution concepts are proposed;
- 1 patent;
- After collaboration, an average of 1 enterprises go on using TRIZ tools on projects;

Results for participating technicians:

- Participating technicians acquired TRIZ logic;
- Ability to explore problems from different perspectives, according to different kinds of conflicts, in particular TRIZ contradictions.
- Ability to search and discover resources to define concept solutions;
- Ability to approach the product development process through a more structured method;

Results for participating enterprises:

- opportunity to experiment the proposed tools in practice on the real technical problems of their interest;
- training technicians on problems belonging to area of their daily activity;
- More confidence with University.

Some aspects that need to be improved and integrated:

- Increase the number of technicians that apply TRIZ tools after collaboration. In Trentine region, a TRIZ public counter is under development, in order to support crafts already familiar with TRIZ;
- Enhance the capacity to transmit theoretic and abstract concepts during learning sessions to participants;
- Enhance the assisted tutorial training in a more precise application of tools by the participants;
- Improve the confidence with the abstraction process of modeling conflicts (contradictions and Su Field modeling)

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