

# Promoting TRIZ in Italian SMEs: models and implementing experiences

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## Abstract

In February 2007, three Italian academic Institutes (Politecnico di Milano, University of Bergamo, University of Florence) promoted the establishment of the *Centre of competence for Systematic Innovation* in order to promote, disseminate and offer services and competences on TRIZ theory and methods for a scientific approach to technological innovation. This extended abstract summarizes some actions adopted to disseminate and implement TRIZ tools and structured techniques in Italian SMEs.

## Keywords

**TRIZ implementing strategy**, technological innovation, systematic innovation, Italian SMEs,

In February 2007, Alintec (a structure in Milan linking the world of research and entrepreneurs), Department of Mechanics of Politecnico di Milano, Department of Industrial Engineering of University of Bergamo, Department of Mechanics and Industrial Technologies of University of Florence, PIN -Scientific and Didactic services for University of Florence (Prato)- and Ceris CNR -Institute of Research on Enterprise and Development- have founded the Italian *Centre of competence for Systematic Innovation* (Centro di competenza per l'Innovazione Sistemica). The mission of the Centre is to promote, diffuse and offer services and competences on a scientific approach to technological innovation to enterprises, institutes and individuals.

This report sums up some practices and experimentations carried out by the Centre to support Italian SMEs in implementation of technological innovation and in their efforts in making product development processes more efficient. This description is followed by conclusions based on 3 years of activities.

Italian industry is composed mainly by craftsmen, micro, small and medium enterprises, with limited economic, human and time resources. As known the current market conditions are very critical. TRIZ experts have recognized some intrinsic aspects of TRIZ theory, which can slow down or obstacle its implementation by beginners.

Now, in this specific frame which models and programs can be defined in order to encourage Italian entrepreneurs to adopt a scientific approach to technological innovation?

Which actions can be planned in order to give Italian SMEs the opportunity to efficiently employ TRIZ tools and techniques?

In literature there are some examples of TRIZ implementation in European SMEs, such as [1] and [2].

First attempts to promote TRIZ in Italian SMEs were carried out by University of Florence and University of Bergamo as reported in [3] and [4]. The positive results of this collaboration paved the way towards subsequent experiences, involving other institutes of scientific and applied research, with the aim to improve and enrich collaborations with Italian SMEs. These activities established the foundation of the Italian Centre of competence for Systematic Innovation in February 2007.

Differently from a consulting company, the Centre has been promoted by Academic Institutes and so didactic activities are based on a scientific approach, with the objective to enhance the efficiency of the programs and collaborations in implementing TRIZ (as described for example in [5]) and systematic innovation in Italian SMEs

The current model proposed is based on a joined collaboration between an enterprise, TRIZ experts and University where the Centre operates to interpret each requirement and improve the dialogue between the actors involved. Participating enterprises are introduced to TRIZ theory gradually, according to different levels of learning. At the first level, TRIZ base contents are introduced in a complete manner without simplification, in order to maintain the efficiency of the method. Each level of training is composed by a didactic phase (theoretic sessions alternate with practical sessions) and an experimentation phase, in which participants work and apply tools on a problem of their real interest with the support of TRIZ facilitators.

This model was implemented by the Centre in projects with Italian enterprises briefly reported below.

The first project was "TRIZ-. Systematic Innovation for Lombard SMEs" (TRIZ-Innovazione sistemica per le PMI lombarde), carried on by Alintec as project leader, the province of Milan

and Formamec (Italian Federation of Associations of Mechanics enterprises). The project was funded by Lombardy Region and involved 9 small enterprises of the province of Milan, operating in automation and mechanic industry together with University of Bergamo, University of Florence and Politecnico di Milano. The operative phase of project lasted from Spring 2006 to October 2006.

Autonomous Province of Trento – Assessorship of Crafts financed a first project of experimentation of TRIZ in Trentine craft enterprises. The project was called “TRIZ – Systematic innovation in Trentine crafts enterprises” (TRIZ – Innovazione sistematica per le imprese artigiane trentine; winter 2007 to summer 2008) and involved 5 crafts enterprises. In 2009, Autonomous Province of Trento - Assessorship of Crafts financed a second project called “TRIZ for trentine crafts” (TRIZ per l’Artigianato trentino; winter 2009 to summer 2010) which involved 9 crafts enterprises. Both projects were carried out by the Centre and CEii Trentino, a Trentine agency for the development of local artisans enterprises and they involved enterprises selected through a public competition.

Results from these experiences are promising.

For every case study almost ten innovative solution concepts were proposed by TRIZ experts in collaboration with participating specialists. At the end of each case study, technicians participating in above mentioned projects acquired TRIZ logic to reformulate problems from different perspectives, according to different kinds of models of conflicts, in particular TRIZ contradictions.

The competences acquired allowed them to approach the product development process through a more structured method. Participating enterprises become more open and more confident with university specialists and they recognize the value of a dialogue with outside resources.

On the basis of the current results, it is possible to identify strengths and limits of the proposed model.

Participating enterprises appreciate the opportunity to experiment the proposed tools in practice on the real technical problems of their interest: technicians acquire confidence with TRIZ techniques on problems belonging to area of their daily activity and by this enterprise is able to evaluate the efficiency of the proposed approach. At the end of the period of collaboration, participating specialists are able to perceive potentialities of TRIZ and transversality of its application. On the mentioned results, some Italian Research Institutes and Technology Transfer Parks decided to join the Centre.

From analysis of evaluation questionnaires filled in by technicians, we identified some aspects that need to be improved and integrated, such as mainly the ability to transmit theoretic and abstract concepts to participants and to support them in more precise tools application.

Further details will be discussed during the presentation at the Conference.

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