DIN - DEPARTMENT OF INDUSTRIAL ENGINEERING

PhD Course in Mechanics and Advanced Engineering Sciences (DIMSAI)

PHD STUDENT POSTER - AY *2016/2017* **Curriculum number *1*** **Cycle *XXXII***

Candidate: *Giampiero Donnici* **Supervisor:** *Alfredo Liverani*

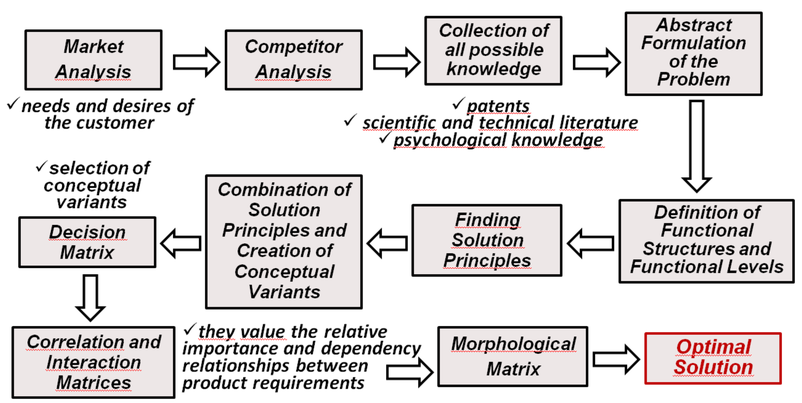
TRIZ and QFD combined method in industrial products optimization

Introduction and aim

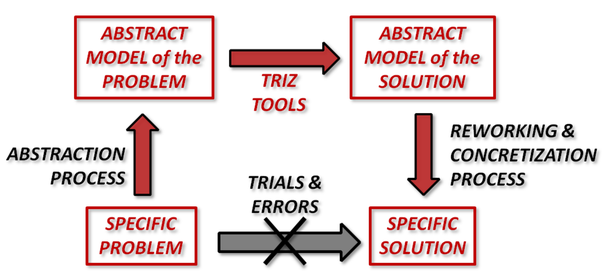
- ***Develop an integrated methodology of TRIZ and QFD based design, suitably modified and adapted, in the field of industrial production***
- ***Realize industrial applications of the integrated design methodology and check the results obtained***

Study and Application of the QFD method:

Starting Point of QFD: Task Clarification



Study and Application of the TRIZ method:

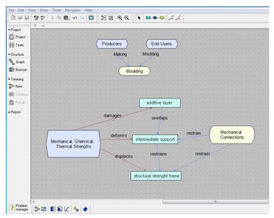


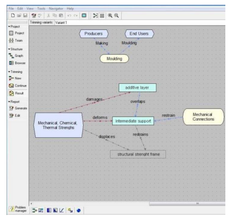
TRIZ and QFD combined method

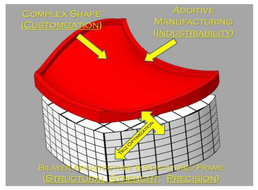
During the application of the QFD methodology in the design of innovative products there may be "inventive problems"

How can we solve these issues?
Using the TRIZ Methodology in specific phases of the QFD method

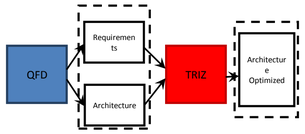
Specific phases of the QFD methodology where the TRIZ method is applied (TRIZ and QFD Integration)

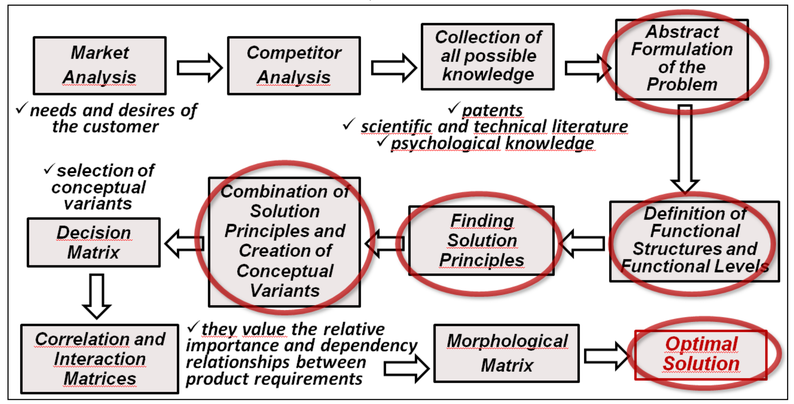


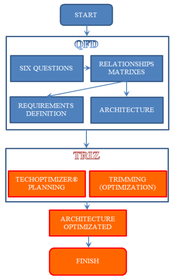




QFD Output – TRIZ Input

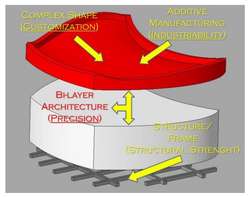


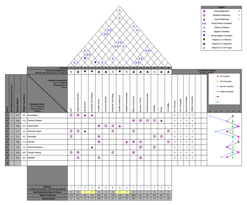


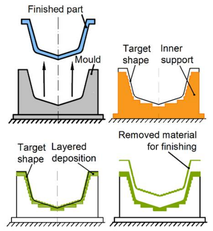


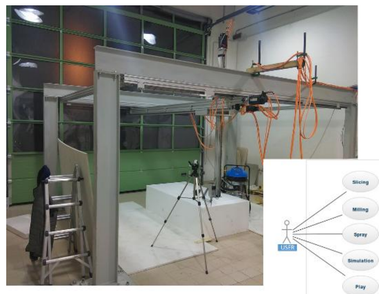
Results: *the Hybrid 3D Manufacturing*

Industrial applications: Open Moulds









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Published articles:

- *Francia D., Caligiana G., Liverani A., Frizziero L., Donnici G., PrinterCAD: a QFD and TRIZ integrated design solution for large size open moulding manufacturing, International Journal on Interactive Design and Manufacturing, 17 January 2017.*
- *Caligiana G., Liverani A., Francia D., Frizziero L., Donnici G., Integrating QFD and TRIZ for innovative design, Journal of Advanced Mechanical Design, Systems, and Manufacturing, 21 April 2017.*
- *Caligiana G., Liverani A., Francia D., Frizziero L., Donnici G., QFD and TRIZ to Sustain the Design of Direct Open Moulds, Sustainable Design and Manufacturing 2017: Selected papers on Sustainable Design and Manufacturing, Pages 898-908.*
- *Frizziero L., Caligiana G., Liverani A., Francia D., Donnici G., Sustainable design of open moulds with QFD and TRIZ combination, Journal of Industrial and Production Engineering, in Press.*

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