

APPLICATION OF MODERN TRIZ FOR TECHNOLOGY ROADMAPPING

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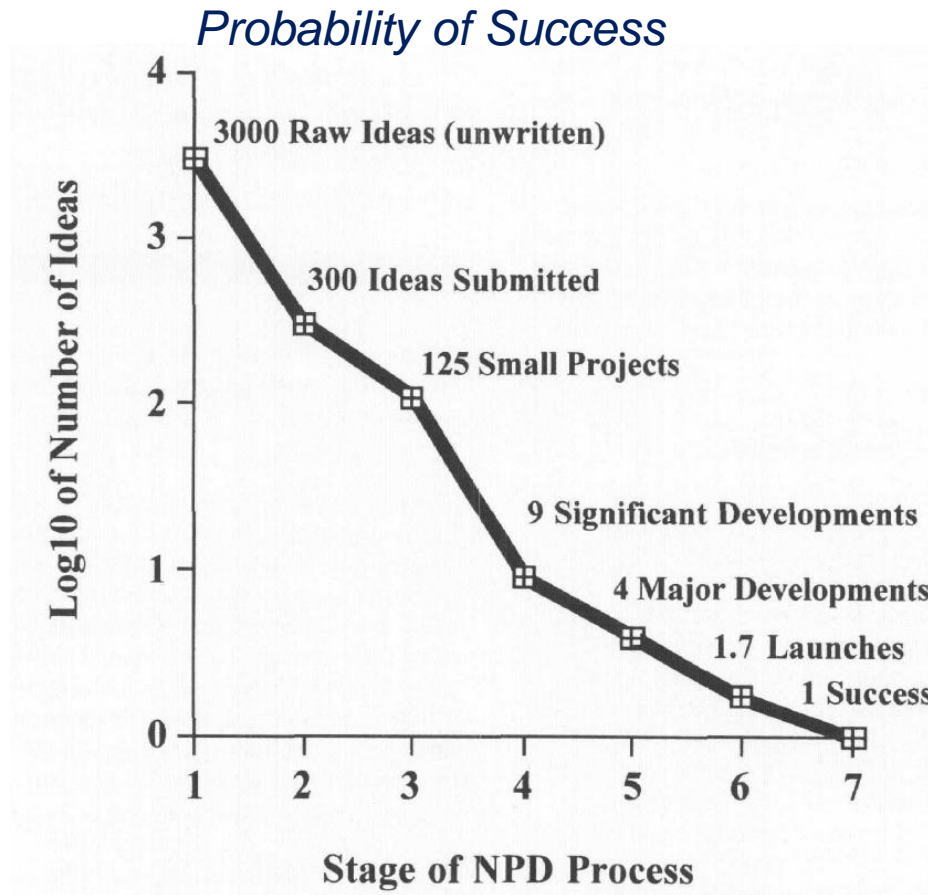
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Outline

- Roadmapping as essential step of successful project execution
- Modern TRIZ and its applications
- Technology Roadmapping enhanced with tools of Modern TRIZ
- Results and Conclusions

Innovation Challenge



Stevens, Gregory A. and James Burley. "3000 raw ideas = 1 commercial success!" *Research z Technology Management* 40(3), pp. 16-27 (May-June, 1997).

Value of Innovation Process

$$\text{Value} = \frac{\text{The idea}}{\text{Number of ideas}}$$

$$\text{Ideal Value} = \frac{\text{The idea}}{\text{The idea}}$$

Ways to Increase Probability Of Success

- Nowadays it is obvious that any new product as well as the technologies for its creation should be developed based on the business strategy.
- Technological resources is an integral part of business planning.



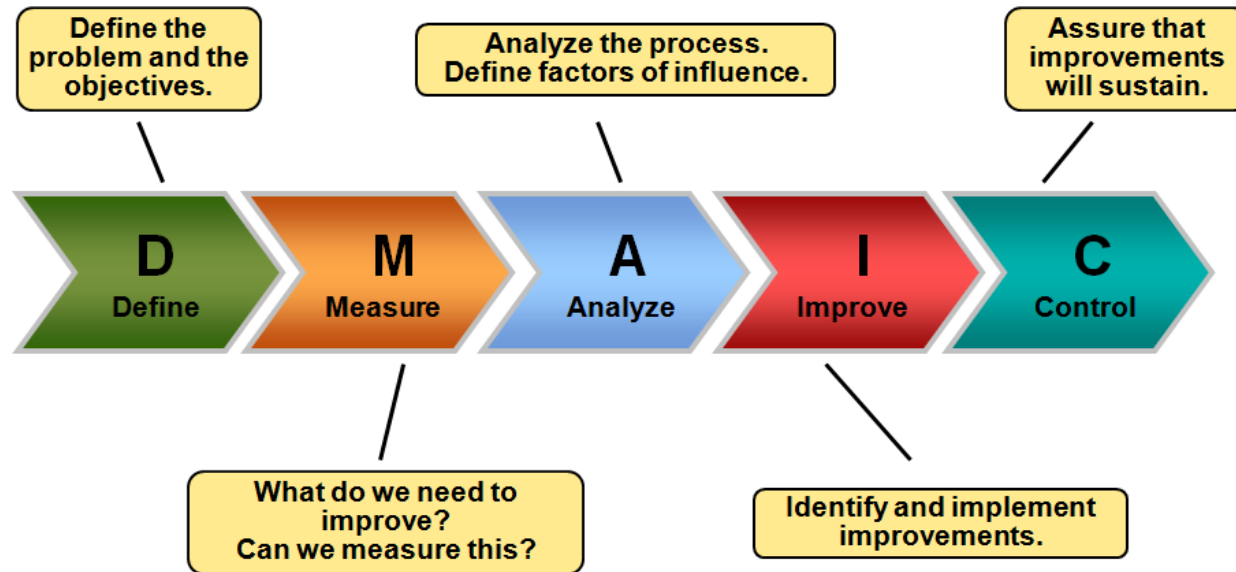
Source of picture: <http://www.consultproblems.com/business-goals/>

- **Technology Roadmaps** (TRM) establish correlation between identified market needs and trends with existing and emerging technologies for a specific industry sector to develop new and improve existing products.

Best Practice. Examples of Roadmaps

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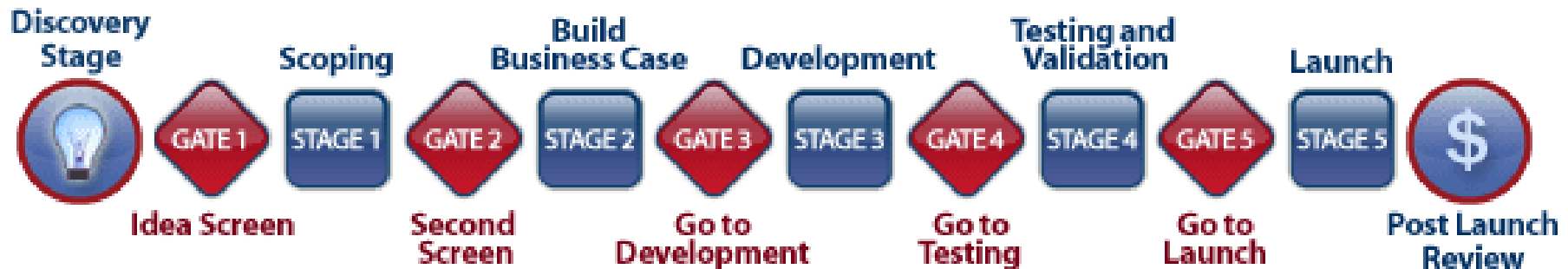
DMAIC Roadmap



DMAIC refers to a data-driven improvement cycle used for improving, optimizing and stabilizing business processes and designs.

Six Sigma. Focuses on capability and reducing variation: <http://www.symbolbv.com/en/six-sigma.html>

Best Practice. Examples of Roadmaps

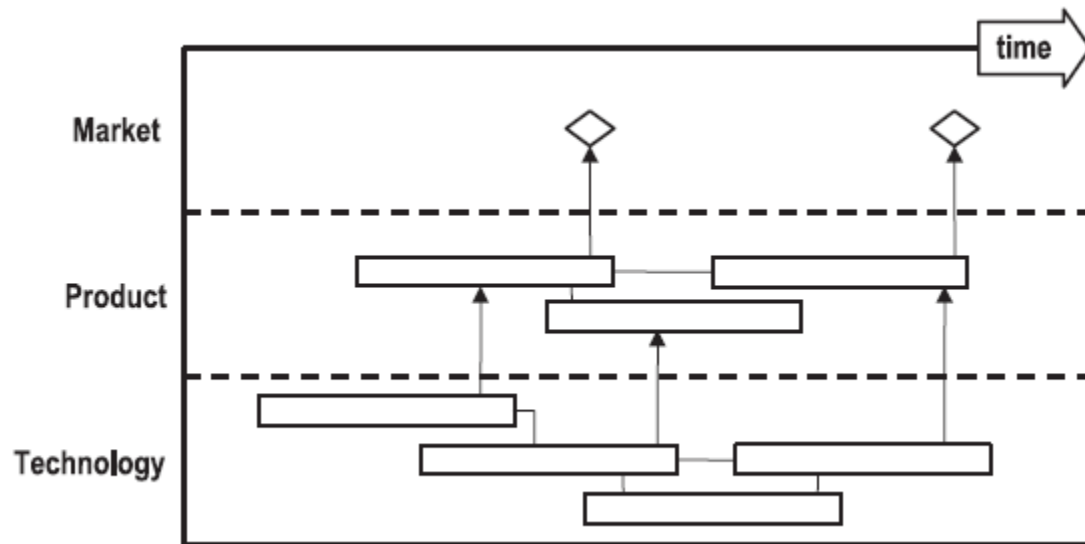


A Stage-Gate System is a conceptual and operational roadmap for moving a new-product project from idea to launch. Stage-Gate divides the effort into distinct stages separated by management decision gates (gatekeeping). Cross-functional teams must successfully complete a prescribed set of related cross-functional activities in each stage prior to obtaining management approval to proceed to the next stage of product development.

Stage-Gate® - Your Roadmap for New Product Development <http://www.prod-dev.com/stage-gate.php>

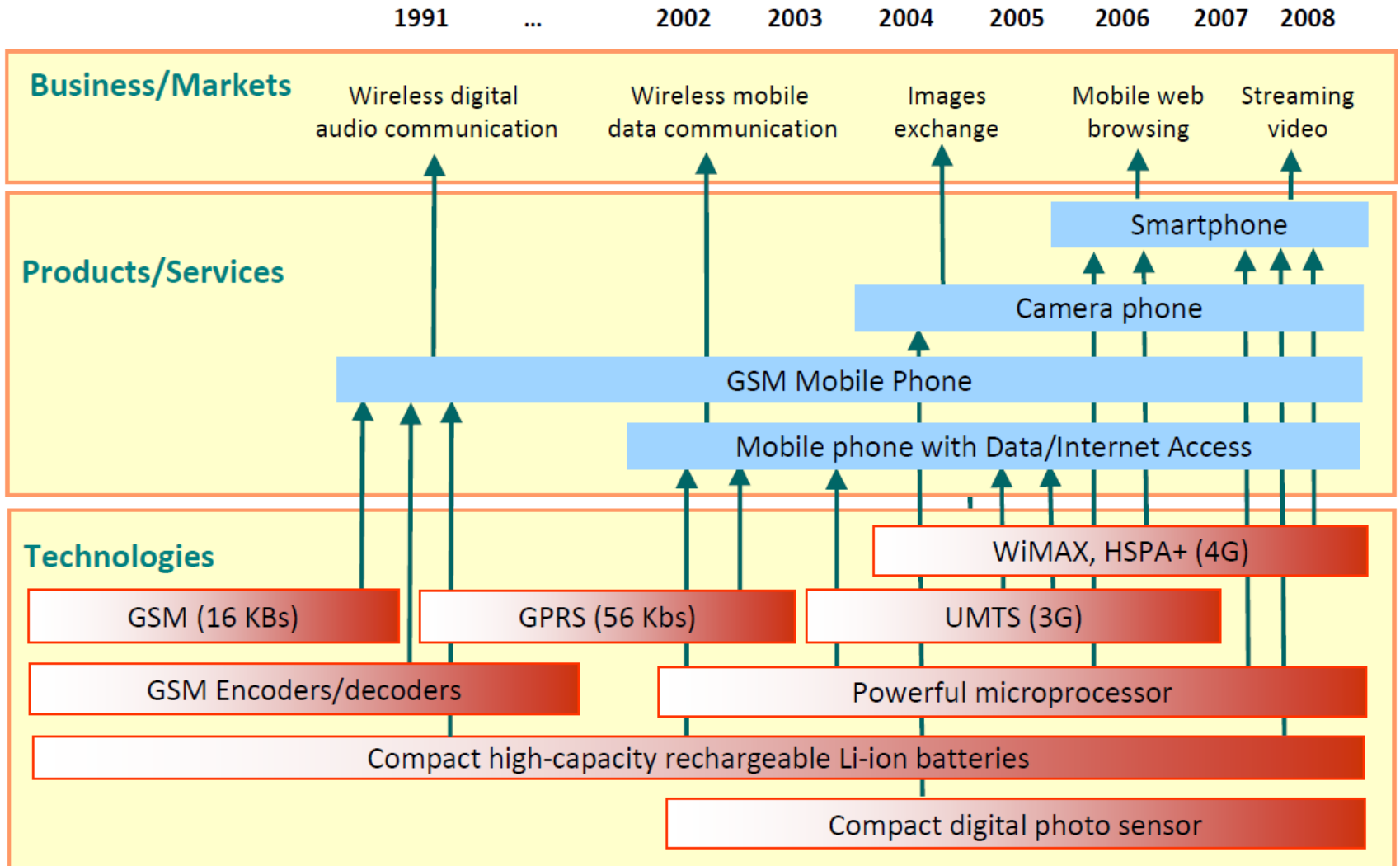
Technology Roadmapping

“Technology Roadmapping is a flexible technique that is widely used within industry to support strategic and long-range planning. The approach provides a structured (and often graphical) means for exploring and communicating the relationships between evolving and developing markets, products and technologies over time.”



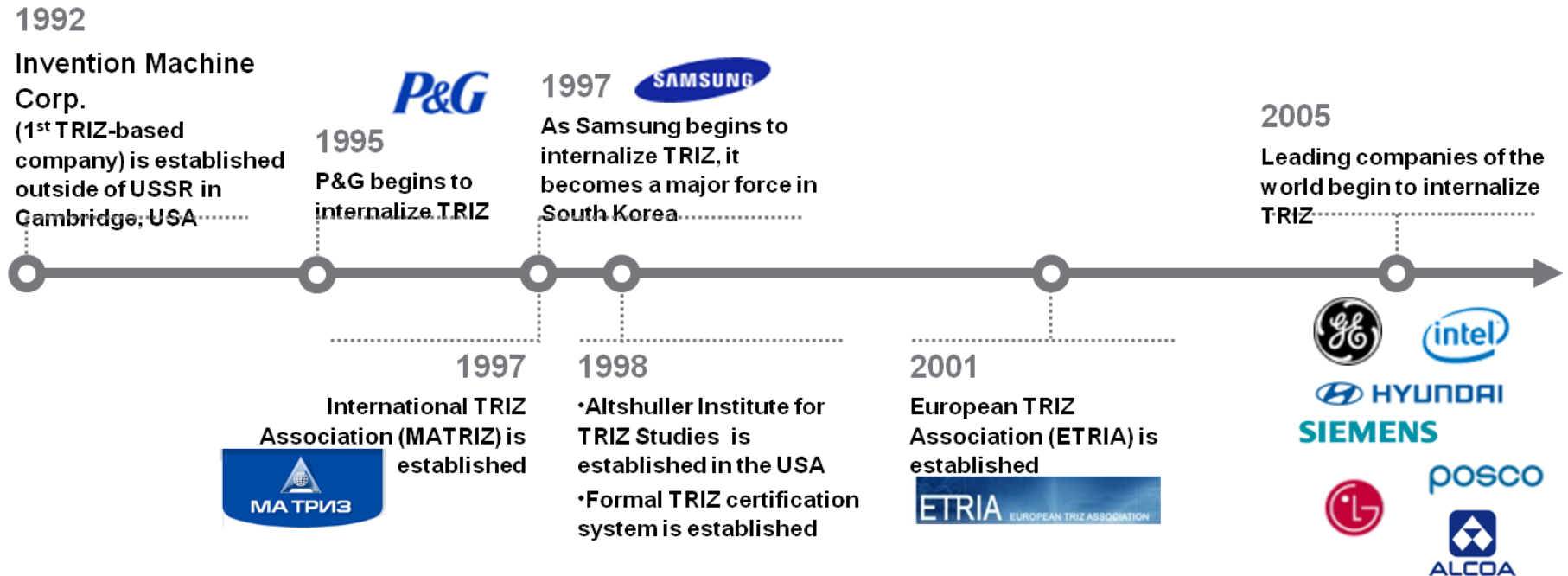
Robert Phaal; Clare J.P. Farrukh; David R. Probert : Technology roadmapping - A planning framework for evolution and revolution – Sciencedirect; Technological Forecasting & Social Change 71 (2004) 5–26.

Case Study. TRM: Wireless Communication (Historic)



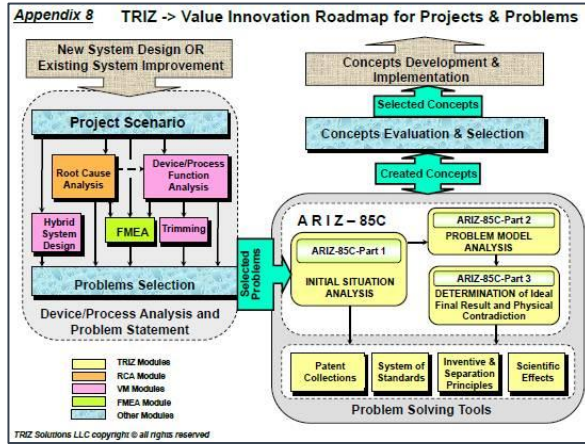
TRIZ can Help to Address Innovation Challenge **BUT ...**

Despite the fact that TRIZ has been internalizing by the world leading companies since 1995, it is still far to be used at the initial stages of strategic and business planning.

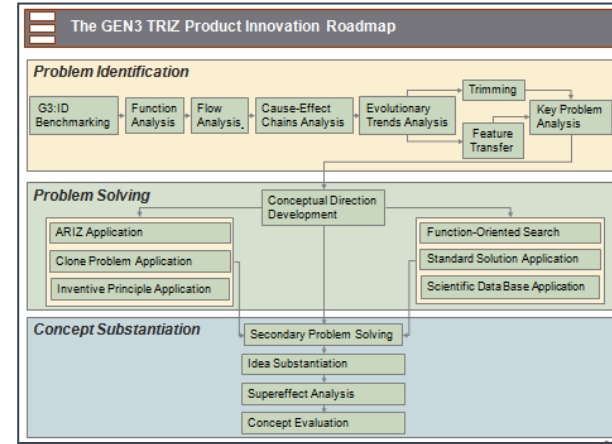


History of World-wide TRIZ Movement (Fragment)

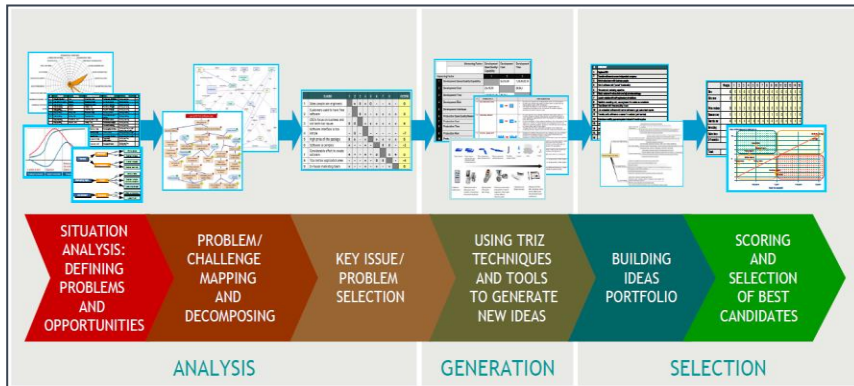
Roadmaps for TRIZ Projects Exist **BUT ...**



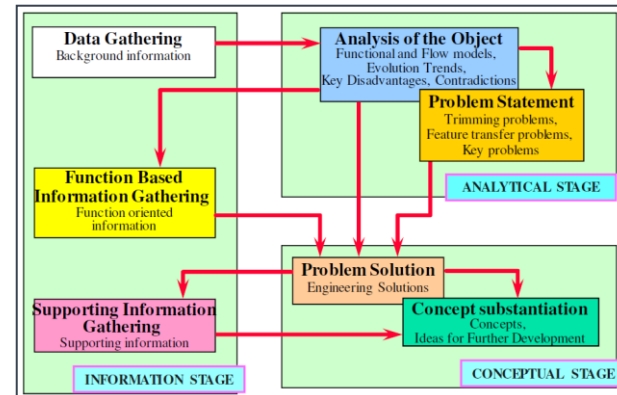
Isak Bukhman "TRIZ Value Innovation Roadmap for Projects Innovation Roadmaps"



TRIZ training materials of GEN3 Partners, Inc.



Valeri Souchkov "Made with TRIZ"

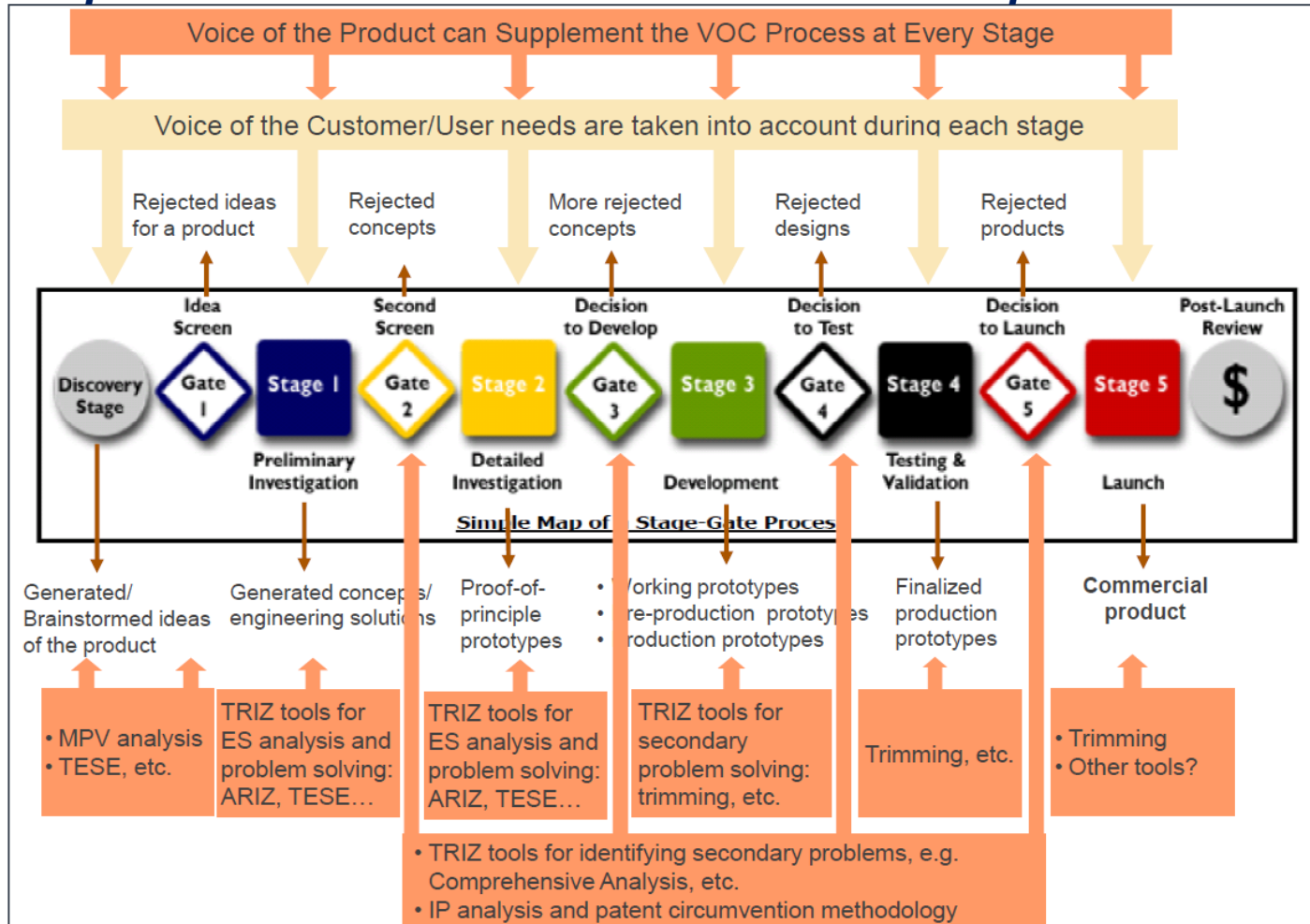


Shree Phadnis "TRIZ an Introduction & Case study"

Typically TRIZ Roadmaps are used by their authors only. These roadmaps have zero or negligible connection with the actual business roadmaps.

TRIZ-Assisted Stage-Gate Process Roadmap (Draft)

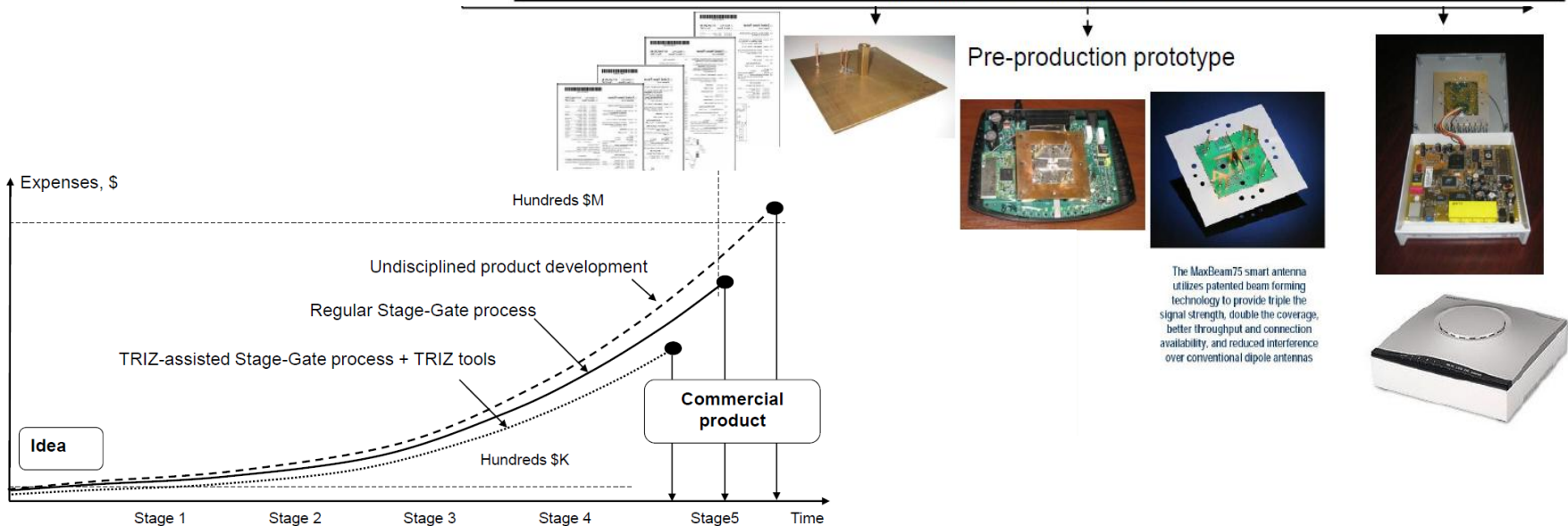
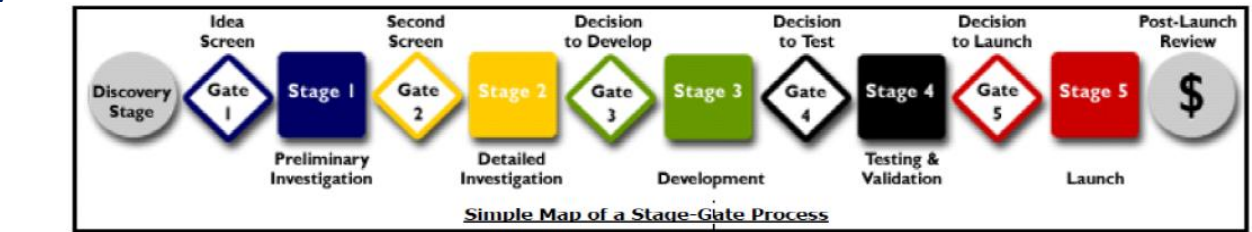
There are attempts to match TRIZ tools with standard NPD processes



Case Study. TRIZ-Assisted Stage-Gate Process

Smart Antenna Development

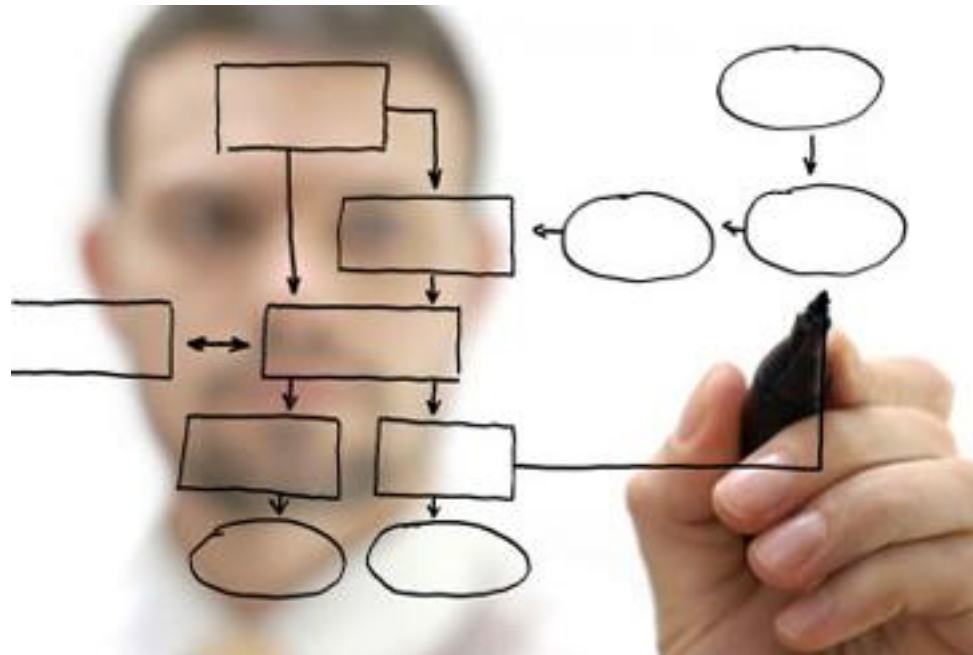
According to O.Abramov, if TRIZ experts are involved into NPD process from the earliest stage, the level of investment and time to the new product launch can be significantly reduced (details are available at *)



* O. J. Abramov. INDUSTRY BEST PRACTICES AND THE ROLE OF TRIZ IN DEVELOPING NEW PRODUCTS. Proceedings of TRIZ Fest 2013, Kiev

TRIZ is Typically Used for Problem Solving **BUT...**

- ***The Modern TRIZ offers new tools that have proved their efficiency for analysis and problem identification***
- ***Those tools and practical aspects of their applications are not well known***
- ***There is a psychological inertia – “TRIZ is only good for solving problems”, “all tools of TRIZ are well organized in ARIZ 85 C”***



Source of picture: <http://www.innovationservices.philips.com/service-catalog/services/concept-creation-support/innovation-roadmapping>

Examples of Modern TRIZ Tools

- Connecting business challenges to technical problems in product/process innovation:

Main Parameters of Value (MPV) Analysis

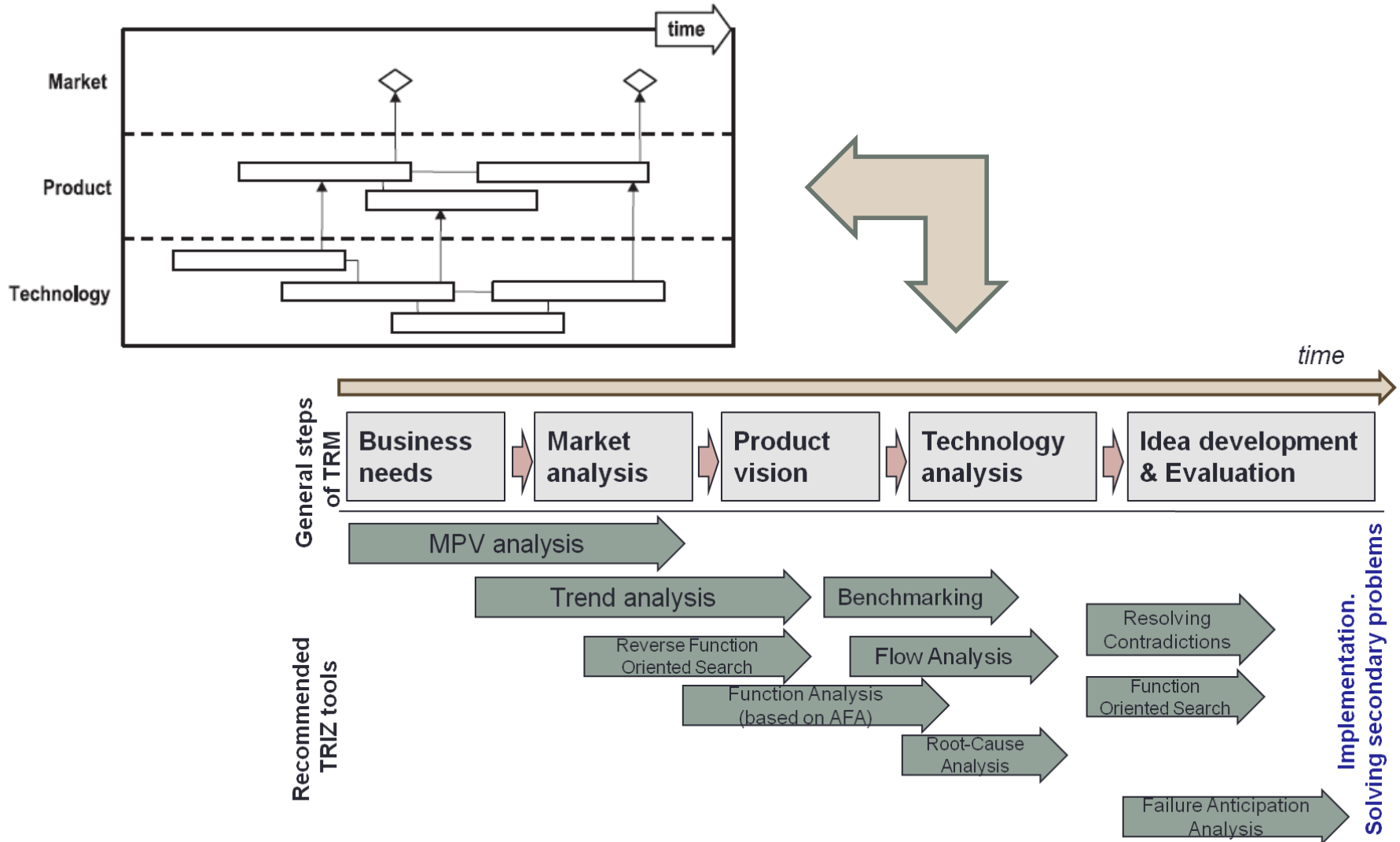
- TRIZ can be employed to identify new areas of application for emerging technologies:

Reverse Function Oriented Search (RFOS)

- Analytical Stage of the technical project can be enhanced:

Advanced Function Approach (AFA)

General Example of TRM Utilizing Tools of Modern TRIZ



Results and Conclusions

- The Modern TRIZ offers a number of analytical tools including MPV analysis, Function Analysis and Advanced Function Approach, Reverse Function Oriented Search and others that can be used for problem identification and formulation at the earliest stages of innovative projects.
- In order to enhance probability of success of the NPD projects, tools of the Modern TRIZ should be incorporated into Technology Roadmaps that are already used in the company. This way allows more natural adaptation of TRIZ concepts by business and strategic planners comparing to introducing new independent TRIZ roadmaps.
- Integration of the Modern TRIZ approach (including its analytical tools) into TRM will lead to:
 - Increasing efficiency of the projects' execution;
 - Increasing predictability of the results; decreasing time of development and level of investment;
 - Further popularization and development of TRIZ in the real industrial areas.

THANK YOU FOR YOUR ATTENTION!!!



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