

2011 DFSS TOOLKIT

You Could Choose whether

Reading Masterpiece **OR** Talking to the Master

Do you have a group of 10 or more people that require a certain technical training?

- We can tailor a course to specifically meet your needs!
- Or you can select from one of our public courses on Menu, and have us deliver it in-house!

SAVE your time and cost involved in training your staff
CUSTOMIZE your training - and have InnoLab Training Services deliver a course in-house
IMPROVE workflow by "learning team building", meanwhile get the ability to consult with tutors about specific issues and subjects

Please call or email us to discuss your requirements and receive a proposal and quotation:



86 21 5128 7875



86 21 5128 7337



Marketing@InnoLab.com.cn

Menu

- p VOC >> P2
- p TRIZ >> P3
- p DOE >> P3
- p DFSS Deployment >> P2
- p QFD
- p Taguchi Method
- p FMEA
- p Axiomatic Design
- p Tolerance Design
- p Response Surface Method
- p Multivariate Statistical Methods
- p Quality Management
- p Statistical Analysis
- p Six Sigma
- p Knowledge Management

Master & Masterpiece

>> [See more on P5](#)

Prof. Kai Yang is the world renowned expert in Quality Engineering, Reliability Engineering, Design For Six Sigma, TRIZ; He is a pioneer in Lean Knowledge Management and Lean Product Development.

Prof. Kai Yang is the author of the Best Seller Books in DFSS:

<Design For Six Sigma – A Roadmap for Product Development>

An Amazon top ranking and the most authoritative one in Design for Six Sigma field

<Design For Six Sigma for Service>

The first book that link DFSS to service and provide a clear roadmap to drastically improve service process

<Capture and Voice of Customer>

A Newly Published Book in 2007

Tailor-Made but Fast Register Process

>> [See more on P6](#)



Companies in China who have benefited from Prof. Yang's In-house trainings

"This custom-tailored training was well structured and content rich. It delivered some much needed concepts and tools that would help our new product development teams to better incorporate customer needs into our new products and optimize the design cycle. A very compact 3-day but impact training! Thanks, InnoLab!"

- Avery Dennison Kunshan Neal Research Center



2011 DFSS TOOLKIT

Training Proposal

In-house training can be conducted at your premises or at one of our training facilities. We are happy to conduct courses as half or full-day workshops or multiple day sessions with on-site activities. Here below, we proposed two-day training sessions for your information.

VOC: Voice of Customer

VOC is a term used in business to describe the process of capturing a customer's requirements. They are generally conducted at the start of any new product, process, or service design initiative in order to better understand the customer's wants and needs, and as the key input for new product definition, Quality Function Deployment (QFD), and the setting of detailed design specifications.

Overview of VOC

- I Identify Customers
- I Traditional VOC Collection Methods
- I Ethnographic VOC Collection Methods

Overview of VOC Data Collection Methods

- I The Purposes of VOC Data Collection
- I What VOC Data to Collect?
- I Customer Survey Method
- I Focus Group
- I Field Study

VOC Data Analysis

- I Types of VOC Data
- I VOC Data Analysis Methods
- I Quantitative VOC Data Analysis

Critical To Quality Characteristics (CTQ)

- I Translating VOC to CTQ
- I Set Target Values
- I CTQ Flow Down

Quality Function Deployment (QFD)

- I History
- I House of Quality
- I How it works
- I Kano Analysis, Kano Survey
- I Cases

Software Demonstration: Step by Step Instruction to Quick start using QFD!

DFSS: Design For Six Sigma

It is a systematic methodology that uses tools and techniques, strategies, tactics, project management, fundamentally aims at ferreting out the flaws of the product or service or process during the design stage, to improve your business profitability, achieve robust performance of the product/service in the early design stage.

Overview of DFSS, and how it is different from Six Sigma, Lean, Kaizen

- I Value, Innovation and Product Development
- I DFSS and Product Development Stages
- I DFSS Roadmaps
- I Comparing the similarities and differences of DFSS, Lean, Kaizen, Six Sigma
- I Key Success Factors for DFSS Deployment
- I Successful Stories

Overview of DFSS Tools

- I VOC
- I QFD
- I TRIZ
- I Design of Experiment (DOE)
- I Response Surface Method
- I Taguchi Robust Design
- I Taguchi Dynamic Robust Design
- I DFMEA
- I Tolerance Design

Prof. Yang's Outstanding Students

Sam Hamade, *the first 6Sigma Master Black Belt in Ford Motor Company*

Mathew Hu, *Black Belt, Textron Corp has one of the best six Sigma program in USA. Master Black Belt in Ford Motor Company, ASQ certified 6Sigma Black Belt Examination committee member, Editorial board member of International Journal of six Sigma and Competitive*

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TRIZ: Theory of Inventive Problem Solving

TRIZ comprises various systematic techniques - Inventive Principles; Psychological Inertia Overpass System; Physical, Chemical and Geometric Effects; Substance-field and Functional Analysis; Technological Ideality Concept; Technology Forecasting, etc. It helps find a quasi-ideal solution to the inventive problems through the hidden conflicts resolutions based on the knowledge of a system evolution.

Introduction of TRIZ

- I 5 levels of Invention
- I 5 Foundations of TRIZ
- I TRIZ flowchart: D-C-G-E

Function, Resources and Ideality

- I Function Statement & Modeling
- I Functional Analysis Diagram
- I Categories of Resources
- I Ideality

Technical Contradiction & Inventive Principles

- I 39 Technical Parameters
- I 40 Inventive Principles
- I Contradiction Matrix

Physical Contradiction & Separation Principles

- I Space
- I Time
- I Components
- I Parameters

Functional Improvement & Elimination

- I Methods to improve useful functions
- I Methods to eliminate harmful functions
- I Methods to eliminate or contain harmful functions
- I Trimming

S-curve

- I Evolution of technological system
- I General Trend of R&D

Excises & Discussion

DOE: Design of Experiments

DOE is also called statistically-designed experiments. The purpose of the experiment and data analysis is to find the cause-and-effect relationship between the output and experimental factors in a process. TAGUCHI method is a special variant of DOE, to create a robust product design that will perform its fundamental functions with extremely high robustness.

DOE Overview

- I What Can Be Done by Using DOE
- I DOE Project Steps
 - Step 1: Project definition
 - Step 2: Selection of response variable
 - Step 3: Choice of factors, levels, and ranges
 - Step 4: Select an experiment design
 - Step 5: Perform the experiment
 - Step 6: Analyze the data
 - Step 7: Conclusion and recommendations
- I What Information We Can Get from DOE Data Analysis

Full Factorial Experiments

- I General Factorial Experiments
- I Two Level Factorial Experiments

Fractional Factorial Experiments

- I 2 Level Fractional Factorial Experiments
- I Design Resolution
- I 3 Level Full Factorial Experiments
- I 3 Level fractional Factorial Experiments

Introduction to Response Surface Methods (RSM)

- I Single Response RSM
- I Multiple Response RSM

Software Demonstration

Prof. Yang's Outstanding Students

Faysel Khalaf, *Director of Corporate Global Design for 6Sigma Program, Ford Motor Company*

B. El-Haik, *Director of Excellence (equivalent to corporate quality director) of Textron Corp. USA, Master Black Belt, Textron Corp has one of the best 6Sigma programs in the US.*

In-house vs. Workshop

Requires Technical Review to custom-tailor training course

	Custom-tailored In-House Course	Public Awareness Workshop
Duration	2-3 days	1-2 days
When, Where	As scheduled by your company at your select location	Based on InnoLab schedule and location
Who Should Attend	<ul style="list-style-type: none"> Project team members including marketing, engineering, R&D, design, manufacturing, service, quality, etc. Project managers Management executives Internal trainers 	<ul style="list-style-type: none"> R&D Beginners, practitioners Project team technique members and leaders Quality consultants and Six Sigma/DFSS Black Belts Anyone who wishes to gain the most up-to-date DFSS principles
Goal	<ul style="list-style-type: none"> Learn the custom-tailored process that reflects your company's needs, development process, and project goals Hands-on practice with selected tools in your tailored process on your project 	<ul style="list-style-type: none"> Learn basics of modern R&D toolkits using generic process models Hands-on exposure with basic tools
Topics (a general outline)	<ul style="list-style-type: none"> Brief history and principles of each tool How and why it works of your product How to deploy these specifications and align your business processes Case studies in your industry How and where to use the tools of your tailored process, in your tailored sequence with links to your development process How to implement and improve your development process 	<ul style="list-style-type: none"> Brief history and principles of each tool How and why it works How to deploy these specifications Examples of best practice How to implement and improve your development process
Learning Material	<ul style="list-style-type: none"> Lecture Audiovisual Group Discussion with your product Exercises within industry case Step-by-Step Software Demonstration 	<ul style="list-style-type: none"> Lecture Audiovisual Brain Storm Case Study Classroom Exercises Brief Software Demonstration
Things to bring	<ul style="list-style-type: none"> Cross-functional project team Relevant marketing and technical data for your project Other data and equipment as discussed with your instructor Computer required 	<ul style="list-style-type: none"> Relevant marketing and technical data for a small project or a part of a project that you are currently working on or plan to work on in the future, if possible Bring your laptop, if possible
Fee	<ul style="list-style-type: none"> Contact InnoLab Tel: 86 21 5128 7875, please provide information include: company name, address, telephone, description of your business, project, training needs, etc. 	<ul style="list-style-type: none"> Refer to the workshop brochure and registration form



Prof. Kai Yang

Full Professor in Wayne State University, Michigan, USA

World Renowned Expert in

Quality Engineering, Reliability Engineering, Six Sigma, TRIZ and Lean PD

Expert- world renowned in Quality Engineering, Reliability Engineering & Six Sigma;

Professor- the department of Industrial and manufacturing Engineering Wayne State University in Detroit, Michigan;

Consultant- more than 9 years experience in General Motors, Ford Motor Company, and Daimler Chrysler Corporation and Siemens Corporation; awarded research contracts over \$2 million from: US National Science Foundation, General Motors Corporation, Ford Motor Company, and DaimlerChrysler Corporation;

Consulting Experience

Before 2005

- Quality consultant for American Low Emission Paint Consortium (Detroit, Michigan), provided training on Taguchi Method, Design of experiment method, Response surface method; led and designed several key experiments to optimize the new low mission paint process to gain higher transfer efficiency, uniform film build and good surface appearance.
- Consulting at DaimlerChrysler Corporation, including spray paint process defect reduction, paint film quality control, body and assembly variation reduction, design evaluation methods for engineering hour reduction.
- Training and Consulting at Siemens Corporation, Muelhaein, Germany, and Orland Florida, conducted 5 different training programs, the topics including Axiomatic Design, TRIZ, DOE, Taguchi Method, Tolerance Design Conducted Training on DFSS & FMEA for R&D Center, Delta Electrics, Zhengzhou Nissan, ZTE

2006

- Provided 6 training sessions for Siemens Power Generation in both Muelheim, Germany and Orlando, FL, including TRIZ, Axiomatic design, DOE, Taguchi Method, Response Surface Method, and Tolerance Design. Provided help in Siemens DFSS projects, as an overall DFSS initiative, Siemens successfully launched 25 DFSS projects.
- Working as main consultant for Daimler Chrysler's project 'Design-based Engineering Hour Per Vehicle' estimation, evaluation and reduction, and analyze how to save labor hours in the early design stage, this project has estimated \$1.5 million economic benefit.
- Coaching for Siemens in Orlando FL, solved one major technical problem during the training with students. That is the second division in the whole Siemens used TRIZ.

2007-2008

- Conducted training on DFSS and TRIZ for Emerson Climate Technologies
- Conducted TRIZ and DFSS, QFD for Avery Dennison, Metrologc, Weidmuller, and TRW
- InnoLab Public workshops on DFSS, TRIZ and LPD (A consecutive three-year)
- Knowledge Management Consulting Project for Fangle Auto Parts (Shanghai)

Publications

4 Best Seller books; more than 70 papers published. "Design for Six Sigma--A Roadmap for Product Development", is an Amazon top ranking Design for Six Sigma book, which is also considered as the most authoritative one in DFSS Field.



Research Projects

1991-1999

Automotive body assembly process variation reduction, new vehicle launch variation reduction, automotive dimensional quality data analysis, funded by GM, \$1.1 Million. As a result of this work, Prof. Yang's graduate students helped GM to developed a powerful software called 'Vehicle data animation tool kits', which visualizes the variation pattern and effectively trouble shoots the root causes. Prof. Yang and his team greatly contributed in helping GM to reduce the body assembly process variation by 50%. Recently, Daimler Chrysler Corp contacted Prof. Yang in helping them to develop the similar system.

1999-2002

computer aided quality analysis for paint operation, funded by DaimlerChrysler, \$387,000. This is a software for real time computer animation of paint process based on paint quality measurement data in production process

1995-1997

Multistate reliability model and quality loss analysis, funded by US national Science Foundation, \$200,000.

1994-2004

Electronic packaging process quality improvement, wire bonding process optimization, funded by Ford/Visteon, 1996-2004, \$454,000. Implemented a lot of DFSS methods, such as Taguchi method, TRIZ, response surface, reliability allocation and testing.

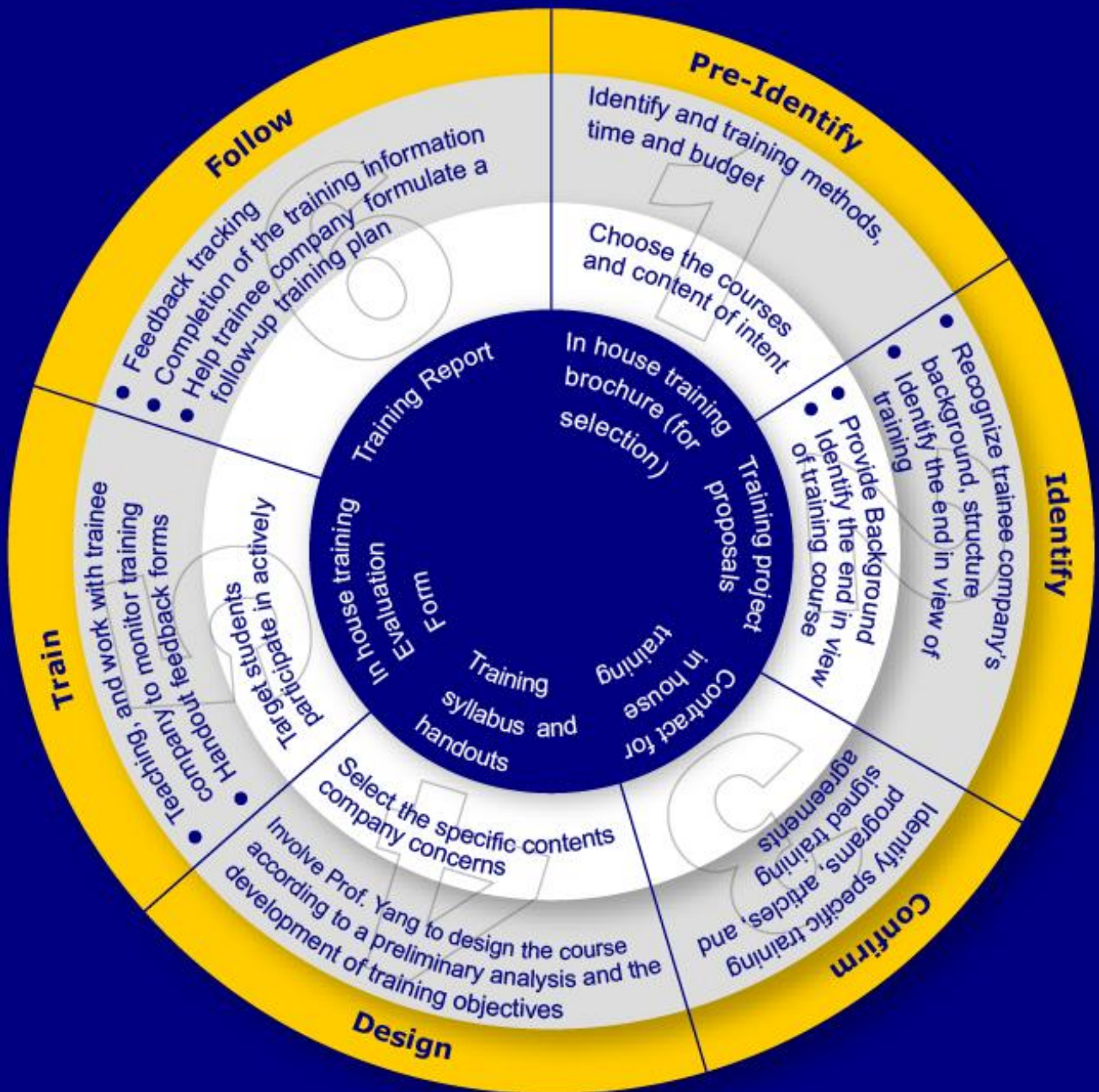
1992-1994

Fuel system hydro-carbon emission reduction, funded by Ford, \$156,000.

2005-2008

Robust Design Tool Kits development, funded by Siemens Corporation. \$400,000. Prof. Yang and his team are helping Siemens to develop special robust design tools in their product development process. Prof. Yang is helping many of Siemens DFSS projects.

In House Training Service Process



● What SP Provide | ● What Trainee Company provide | ○ What will Trainee get

If your company has a team of people with similar training needs, you can benefit by customizing any one of our public innovation seminars to be delivered in the privacy and convenience of your own organization.

Save Time. In-house training offers your employees the convenience of training close to home, saving you time and minimizing disruption.

Save Money. The more people you train, the more money you save. Depending on the size of your group, the per-person tuition is usually less than our public seminar fees.

Build Better Teams. Teams that learn together perform better together and product innovation requires high performing, cross functional teams. In-house training offers consistent communication, collaborative discussions and interactive, hands-on exercises that build better teams.

Get Personal. The more personalized the training, the faster its adoption. Tailor any of our public seminars to fit your needs. In the privacy of your own organization, our instructors can focus in on your specific issues and move right to the heart of what you really want to discuss.

It's Convenient. Just let us know what works for you. We can deliver training with flexible scheduling – even on weekends, evenings or holidays - if that is what you need to equip your teams with the knowledge to win at product innovation.

Our instructors are subject matter experts with industry experience, and they deliver highly engaging sessions. Each instructor has the experience to answer the most challenging questions and can handle even the toughest of critics.

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阅读厚厚的名著 或 聘请名师登堂

选择权在你!

你正负责一支10个人或更多的研发小组? 亟需特定的技术培训?

- 我们为你的特定需求提供课程
 - 你也可以从课程菜单中选择需要你所需要的课程
- 我们为你提供内训课程!

节约 你的时间和成本, 同时为你的员工提供优质培训

定制 你需要的课程, 和InnoLab一起分享内部培训课程

提高 工作效率, 并且与大师探讨针对性问题

电话或通过邮件联系我们, 通过一同分析需求, 你将得到属于你自己的内训课程建议书:



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课程菜单

- p 捕捉和分析客户之声-VOC >> P2
- p 创新问题解决方法-TRIZ >> P3
- p 实验设计-DOE >> P3
- p 六西格玛设计-DFSS >> P2
- p 质量功能展开-QFD
- p 田口法
- p 误差设计-FMEA
- p 公理化设计
- p 公差法
- p 响应面法
- p 多元统计分析法
- p 质量管理
- p 数据分析
- p 六西格玛
- p 知识管理

名师名著

>> 详情见 P5

杨凯教授是世界知名专家, 专攻于质量工程, 可靠性工程, 六西格玛设计, TRIZ等领域, 他同时还是现代企业研发知识管理和精益产品开发的先行者和实践大师!

著有在六西格玛设计领域最权威的著作:

《六西格玛设计 – 产品开发的路标》

亚马逊网站六西格玛领域保持领先地位, 最权威的著作

《服务业的六西格玛设计》

第一本将六西格玛设计和服务行业相结合, 并为服务流程改善提供清晰指导的著作

《用六西格玛确定关键客户需要》

2007年新著作

快速注册流程

>> 详情见 P6

联系阶段

准备阶段

确认阶段

设计阶段

培训阶段

跟进阶段

受益于杨凯教授内训课程的部分公司

“量身定制的DFSS培训课程, 思路清晰, 内容翔实. 新产品研发团队可以运用所学了解客户需求, 并将其运用到设计最优化流程中. 感谢InnoLab为我们提供了三天紧凑而有效的培训.

--- 艾利亚太研发中心



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内训建议

内训课程地点可以选择你指定的授课地点，或者由我们提供。你可以选择全天或几天的连续课程。我们精选了4门热点课程，并制作成2天培训内容供你参阅。

VOC: 捕捉客户声音

在商业上VOC是用来表述捕捉客户需求过程的专有名词，一般用于新产品开发流程前端，或服务设计初期，作用在于更好的获得客户的需求，同时作为新产品开发，质量功能展开（QFD），以及制定详细设计规格的关键输入端。

VOC 概述

- | 识别客户
- | 传统VOC收集方法
- | 现代VOC收集方法

VOC 数据收集方法概述

- | VOC数据收集的目的
- | 收集哪些VOC数据
- | 客户调研方法
- | 小组访谈法
- | 实地考察法

VOC 数据分析

- | VOC 数据分类
- | VOC 数据分析方法
- | VOC 数据定量分析法

CTQ 品质关键点特征

- | 把客户声音转化成品质关键点
- | 设定目标价值
- | 品质关键点

QFD 质量功能展开

- | 历史
- | 质量屋
- | 如何使用
- | Kano分析和调研
- | 案例分析

软件应用：逐步指导迅速启动QFD!

DFSS: 六西格玛设计

六西格玛设计旨在产品服务或流程设计阶段而非生产或质量控制阶段寻找缺陷，提高业务盈利，在产品服务设计阶段实现高性能，并减少产品服务研发周期，结合工具技术、战略战术及项目管理系统的的方法论。实现六西格玛设计的理想目标，必须依靠更先进的工具和方法。

六西格玛设计介绍

- | 价值、创新和产品开发
- | 六西格玛设计和产品开发过程
- | 六西格玛设计“路标”
- | 六西格玛设计、精益、改善、六西格玛的比较分析
- | 开展六西格玛设计成功的关键因素
- | 成功案例

选择六西格玛设计工具

- | 有效获取及分析客户之声（VOC）
- | 质量功能展开（QFD）
- | 创新问题解决方法（TRIZ）
- | 实验设计法（DOE）
- | 响应面法
- | 田口法
- | 动态田口法
- | 误差设计
- | 公差法

杨教授培养的学生

Sam Hamade 福特公司第一位六西格玛黑带大师

Mathew Hu 福特公司六西格玛黑带大师，美国质量学（ASQ）认证的西格玛黑带段级考试委员会成员，六西格玛与竞争优势—国际期刊编委会成员

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TRIZ: 创新问题解决方法

TRIZ 理论认为，大量发明和创新面临的基本问题和矛盾是相同的，只是技术领域不同而已。这说明同样的技术发明原则和解决方案可以一次次地被重新使用。将这些有关的知识进行提炼和重新组织，就可以指导后来者的创新和开发。TRIZ 体系正是基于这一思路开发的，打破了我们思考问题的心理惰性和知识面的制约，避免了创新过程中的盲目性和局限性，指出了解决问题的方向和途径。

TRIZ 介绍

- | 发明的5个层次
- | TRIZ的五项基本原则
- | TRIZ流程图: D-C-G-E

功能、资源和理想度

- | 功能陈述的模型
- | 功能分析图
- | 资源的种类
- | 理想度

技术矛盾和发明原则

- | 39个技术参数矛盾矩阵
- | 40各发明原则
- | 矛盾矩阵

物理矛盾和分析原则

- | 空间
- | 时间
- | 部件
- | 参数

功能改进和消除

- | 改进有用功能的方法
- | 消除有害功能的方法
- | 消除或建校有害功能的方法
- | 修整

S 曲线

- | 技术系统进化
- | 研发的趋势

练习与案例分析

DOE: 实验设计

实验设计又被称为统计设计实验，实验和数据分析在于找出产量和实验过程因素之间的因果关系。

田口法（稳健参数设计）是实验设计中一种特殊的方法，目的在于创造一个强有力的产品设计。该设计因其极高的性能而出色的履行其根本职能。

DOE 概述

- | DOE的作用
- | DOE 项目的步骤
 - 第1步：项目定义
 - 第2步：反映变量的选择
 - 第3步：因素、层次、范围的选择
 - 第4步：选择实验设计
 - 第5步：开展实验
 - 第6步：数据分析
 - 第7步：总结意见
- | 从实验设计数据分析中获得的信息

全因子（充分因子）实验

- | 一般因子实验
- | 二水平因子实验

部分析因设计

- | 二水平部分析因设计
- | 设计决议
- | 三水平全因子实验
- | 三水平部分吸引实验

RSM 反应面方法概要

- | 单反应面
- | 多反应面

软件应用介绍

杨教授培养的学生

Faysel Khalaf 福特全球六西格玛设计总监

B. El-Haik 美国Textron公司质量总监，六西格玛黑带大师。Textron公司拥有美国最好的六西格玛项目。

	针对性的内训课程	公开课
课程周期	2-3 天	1-2 天
时间地点	根据客户公司的日程和地点选择	根据InnoLab的排课日程和地点选择
谁来参加	<ul style="list-style-type: none"> 项目组成员，包括市场、技术、研发、设计、制造、服务、质量等 项目经理 公司管理层 内部培训师 	<ul style="list-style-type: none"> 研发初学者，实践者 项目小组技术成员和领导 培训专员 质量专家和六西格玛黑带 任何想学习最新六西格玛设计工具的初学者
课程目的	<ul style="list-style-type: none"> 根据客户需求针对性的设置课程 根据项目需要选择可以直接实践的工具 	<ul style="list-style-type: none"> 学习基本现代研发工具 使用基本工具应用于一般流程模型
课程内容	<ul style="list-style-type: none"> 针对性工具适用原则和历史 为什么使用与你的产品 如何应用于业务流程 行业案例分析 在业务流程的哪部分以及如何应用这些工具 如何应用这些工具提高流程绩效 	<ul style="list-style-type: none"> 简述各工具适用原则和历史 使用原因 如何使用该工具 最佳实践的案例分析 如何应用工具提高流程绩效
学习资料	<ul style="list-style-type: none"> 视听教材 针对产品的小组讨论 行业内案例分析 现场软件应用指导 	<ul style="list-style-type: none"> 视听教材 头脑风暴案例讨论 课堂练习 初步软件指导
学员准备	<ul style="list-style-type: none"> 项目小组交叉部门人员 针对项目的相关市场、技术信息 其他希望与老师探讨的数据和设备等 务备计算机 	<ul style="list-style-type: none"> 允许范围内政从事项目，或项目一部分的相关市场和技术数据 自备笔记本电脑
费用	<ul style="list-style-type: none"> 联系InnoLab: 86 21 5128 7875, 同时提供信息包括: 公司名称, 电话, 业务范围, 项目, 培训需求等 	<ul style="list-style-type: none"> 查看公开课宣传册及报名表



杨凯 教授

质量工程，可靠性工程，六西格玛设计，创新问题解决方法，精益产品开发领域的全球顶级专家

- 1 **顶级专家**- 质量工程,可靠性工程,六西格玛,创新问题解决方法;
- 1 **学科教授**- 美国密歇根州底特律市维恩州立大学工业与制造工程学院;
- 1 **科研经费**- 超过**250万**美元, 来源为美国国家科学基金, 通用汽车, 福特汽车, 戴姆勒克莱斯勒公司, 西门子公司;
- 1 **学术论文**- 超过**70篇**在高质量学术期刊上发表;
- 1 **咨询经验**- 超过**9年**在国内的企业咨询经验, 并著有**5本书**。

咨询培训经历

2005之前

- 1 杨教授为美国低污染喷涂联合会 (**Detroit, Michigan**) 提供质量培训咨询, 包括田口法、**DOE**法、响应面法等模块; 领导和设计了数个关键实验, 优化新型的低污染喷涂过程以取得更高的转换率, 漆面涂层均匀一致性和优异的漆面涂层外观效果
- 1 在戴姆勒克莱斯勒公司担任顾问, 他完成了很多产品的咨询, 包括喷涂工艺缺陷减少, 漆膜质量控制, 车身和组装变异减少, 并设计了评价方法, 降低工程时间的耗费。
- 1 为多家公司提供六西格玛培训, 包括雅培制药公司 (德克萨斯州, 达拉斯), 柳工 (一家中国的重型机械公司), **York**, 台达电子研发中心, 同时受多家公司邀请进行六西格玛设计工具培训, 包括 **FMEA**、实验设计、田口法、**TRIZ** 等, 咨询公司为博士-西门子家电、中兴通讯、上海通用汽车。

2006

- 1 在德国的 **Muelheim** 和佛罗里达的奥兰多, 为西门子公司提供六期培训, 包括 **TRIZ**, 公理化设计, **DOE**, 田口法, 响应面方法, 以及容差设计。作为一个整体的六西格玛项目, 西门子公司在培训后, 成功地开发了**25项**六西格玛产品, 许多都获得了结论性的成功。
- 1 为戴姆勒克莱斯勒公司担任主要顾问, 提供咨询“每辆汽车的以设计为主的工程小时”这一工程的估计, 评价和减少 (2006年夏天), 这是一个“设计制造”项目, 它可以分析如何在早期设计阶段节约劳动时间。这个项目被估计创造了**150万**美元的经济效益。
- 1 在佛罗里达州的奥兰多为西门子提供的 **TRIZ** 的培训, 在培训学生的过程中, 解决了一个重大的技术问题。而杨教授所培训的部门是西门子全球公司中第二个采用 **TRIZ** 的部门。

2007-2008

- 1 在中国苏州为艾默生环境优化技术公司提供六西格玛和 **TRIZ** 培训
- 1 在中国为艾丽亚太研发中心、魏德米勒以及天合汽车提供 **TRIZ**、**DFSS**、**QFD** 培训
- 1 与创新实验室合作开授 **DFSS**, **TRIZ** 以及 **LPD** 公开课 (三年)
- 1 与方科汽车零部件合作进行知识管理系统咨询项目

著作:

4本畅销书, 超过**70篇**文章发表。

《六西格玛设计——产品开发路标》在亚马逊网站六西格玛领域阅读量保持领先并被认为是该领域最权威的著作。



主要研究项目

1991-1999

车身装配过程变异减少, 新车驱动变异减少, 汽车尺寸质量数据分析, 得到通用汽车开发了一个强有力的软件, 名为“车辆数据动画工作包”, 使得变化规律以及麻烦的根源变得形象化。杨教授和他的团队为通用汽车做出了巨大的贡献, 他们帮助通用汽车减少了**50%**的车身装配过程变异。最近, 戴姆勒克莱斯勒公司与杨教授签订协议, 希望能够帮助他们建立类似的系统。

1999-2002

喷涂操作的电脑辅助质量分析, 由戴姆勒克莱斯勒公司提供**387,000**美元的资金。这是一个建立在生产过程中, 喷涂质量测量数据上的, 关于油漆工艺的实时计算机软件。

1995-1997

多模式可靠性和质量损失分析, 有美国国家科学基金会提供资金**200,000**美元的资金。

1994-2004

电子封装过程质量改进, 丝焊工艺优化, 由福特汽车以及 **Visteon** 提供**454,000**美元的资金支持。实施了很多六西格玛方法, 如田口法, **TRIZ**, 响应面, 可靠性指标分配以及测试。

1992-1994

燃料系统的氧碳减排, 由福特汽车提供**156,000**美元的资金支持。

2005-2008

精良产品设计工具包的开发, 有西门子公司提供**400,000**美元的资金支持。在产品开发的过程方面, 杨教授和他的团队正在帮助西门子制定非常有力的设计工具。杨教授正在为西门子的六西格玛工程提供咨询帮助。

