



TRANSACTIONS FROM
THE SYMPOSIUM ON
QUALITY FUNCTION DEPLOYMENT

www.qfdi.org

contact@qfdi.org

2007: The 19th Symposium on QFD

(ISBN 1-889477-19-2)

Tutorials 2007

General Theory of Innovation to Design a Superior Corporate Strategy by *Greg Yezersky, President, Institute of Professional Innovators, USA*. Why is business success so random? Why can't more companies realize the power of strategy and come up with a successful one? Why can't former leaders employ a new strategy and repeat success more often? What is the connection between strategy and innovation? Is there a robust process to engineer powerful strategies on demand? How can we come up with the right strategies? If we can identify the formula for the science of innovation, we will be able to control the process and create better strategies on demand. The General Theory of Innovation (GTI) is just such a theory that can be used for gaining control over the process of innovation. GTI evolved from the Russian-born inventive problem-solving technique called TRIZ and since 1988 has gone through rigorous tests in real-world conditions with consistently successful results.

Analytic Hierarchy Process (AHP) 2007

KEYNOTE: The Analytic Hierarchy Process: How to Measure Intangibles in a Meaningful Way Side by Side with Tangibles by *Thomas L. Saaty, Ph.D., 2007 Akao Prize Recipient, University of Pittsburgh, USA*. One of the best decision-making methods available today, the Analytic Hierarchy Process (AHP) is a mathematically rigorous and yet relatively easy to use multi-criteria prioritization method that has become an integral part of Modern QFD. Dr. Thomas Saaty, Ph.D., renowned architect of AHP, discusses the fundamentals of AHP through colorful application examples ranging from estimating the cereal industry market share and dominance of various drinks in the U.S. to predicting the outcome of a world chess championship match (Karpov-Korchnoi match) and U.S. presidential elections (1980: Carter-Reagan; 1992 Perot-Bush-Clinton).

The Many Faces of AHP - How to use AHP with Different Audiences for Maximum Results by *Carey Hepler, QFD Black Belt®, Innovation Director, Blue Cross Blue Shield of Florida, USA*. Blue Cross Blue Shield of Florida (BCBSF) is the oldest and most respected health insurance organization in the State of Florida. This paper discusses the company's use of Analytic Hierarchy Processing (AHP) in terms of audience and technology delivery, as well as the advantages and disadvantages of each of the technologies when working with our constituent groups.

AEROSPACE 2007

Development of Highly Reliable Valves for H-IIA Rocket by *K. Kojima, M. Matsuda, and K. Yoshikawa of Mitsubishi Heavy Industries; H. Nanri, K. Okita, and M. Fukuoka of Japan Aerospace Exploration Agency; Yoji Akao, Ph.D., Asahi University, Japan*. H-IIA rocket is Japanese main launch vehicle to put about four tons payloads into Geosynchronous Transfer Orbit at an altitude of some 36,000 kilometers. The rocket consists of many components including tanks, engines, valves and electric equipments. In these components the valves are very important flow-control equipment that controls rocket flight operation, including startup and shutdown of the engine, keeping the tank pressure at a desired level, feeding propellants to the engine, and controlling vehicle attitude in flight. Reliability of the valve is utmost critical to the space mission, launch schedule, and operational costs. This paper reports a joint project by Mitsubishi Heavy Industries and Japan Aerospace Exploration Agency where QFD methods were used to improve reliability of the H-IIA rocket valve design which led to the development of a new model. The presentation will show the QFD approaches, development process for this high reliability valve, and the project accomplishments.

BUSINESS PROCESS 2007

QFD for Effective Business Design by *Hideaki Haraga, Business Development Center, Konica Minolta Technology Center, Inc., Japan*. This paper introduces an example of business function deployment in which expectations and business functions are extracted from the project targets and goals by using a relational diagram. An application method is proposed as a business management tool in which progress is recorded in a matrix of business functions and expectations.

Context Sensitive Solutions (CSS) / Government Projects 2007

Context Sensitive Solutions: The Application of QFD for Developing Public Transportation Projects in the U.S. by *Theodore Hopwood II, P.E., Kentucky Transportation Center, University of Kentucky, USA; Glenn H. Mazur, QFD Red Belt®, The QFD Institute, USA*. For many years, the selection of transportation routes, design of roadway features, etc. were based mostly on engineering considerations. QFD has developed since the 1960s a powerful tool set for new product development that enables engineers to listen to the Voice of the Customer and translate the most important needs into design requirements and then assure their quality in the resulting goods and services. This paper will show how QFD tools can be adapted for Context Sensitive Solutions (CSS) and Design in road building and other large projects.

EDUCATION 2007

Application of QFD to Curriculum Planning of Vocational Education by *Catherine Y. P. Chan, QFD Green Belt®; Gail Taylor; and W. C. Ip of The Hong Kong Polytechnic University, Hong Kong*. Winner of 2007 Akao Scholarship for QFD. This paper proposes a conceptual framework for applying QFD to curriculum planning for vocational education. A study on the content planning of an in-house staff development program illustrates the application method, which can be useful to vocational education institutions in Hong Kong and elsewhere.

Application of QFD in Engineering Education: Assurance of Learning Outcomes Fulfillment by *Zbigniew Prusak, Ph. D., Central Connecticut State University, USA*. Principles of QFD used in assessment of engineering students' activities during classroom and laboratory instruction. Twenty two types of student activities were analyzed for their contribution toward fulfillment of thirty learning outcomes. Each type of student activity was also assessed in terms of its level according to Bloom's taxonomy in senior level courses in engineering design and manufacturing processes. Design projects, concept generation, individual formal presentations and forensic studies proved to be the most universal activities, developing a wide range of professional skills.

Design of a Methodology to Elaborate Curricula CIM of the Industrial Engineer in Spain, Based on QFD by *Isabel Melina Balderrama Durán, Institut Quimic de Sarria, Spain / Bolivia*. Developing a methodology that will allow construction of industrial engineering curriculum that teaches Computer Integrated Manufacturing (CIM) technology requires the support of methods like QFD and other tools such as Delphi, Diagrams of Affinity, Analysis of Systematization of the hierarchy, etc. This research uses QFD and Delphi methods to design a CIM curriculum, translating industry requirements into design characteristics of an online course.

INNOVATION 2007

Using QFD to Involve All Employees in the Corporate Innovation Process by *Kathy Hines, QFD Black Belt®, Innovation Leader, Blue Cross Blue Shield of Florida, USA*. With competition at an all time high, more and more companies are seeking ways to capture that next "big" idea, including Blue Cross Blue Shield of Florida (BCBSF) which currently has over 9,000 employees, each with an idea on how the company can increase membership, reduce costs, differentiate products and services from our competitors and expand our distribution channel. Random idea creations, however, can become a drag on resources and lead to disappointment among those whose ideas are not utilized. When the Voice of the Customer is used to drive idea creation and selection process, then the diversity of our internal resources can be fully harnessed.

KEYNOTE: The Quality Revolution by *Glenn Mazur, Executive Director, QFD Institute and International Council for QFD*. The 2007 Symposium in Williamsburg, Virginia serves a special reminder for what we can learn from history to build a better future. 2007 marked the 400th anniversary of Jamestown, the first permanent English settlement in America which began as a business venture to improve the lives of its citizens through new trade routes, new sources of raw materials, and new opportunities for economic advancement. The descendents of these early settlers would grow wealthy in the next 150 years and begin demanding political and economic rights equal to those of their fellow citizens still in England. Now thirteen colonies spread over a continent and Babel of different ethnicities, economies, and religions, they were able to come together in common cause to resist and eventually revolt against British control. This keynote discusses how technological advancements led to improved product quality and choice, and how this new found choice of goods inevitably led to a demand for freedom of choice in all aspects of life, the revolutionary path from industrial revolution to to consumer, lifestyle, and political revolutions. QFD is about the Voice of the Customer. Once unleashed, this voice continues to demand more and more from the marketplace and beyond. Those who supply goods, services, and ideas will see that when the customer wins, we all win.

KANO MODEL & QFD 2007

QFD Kano Model for Designing College Women's Dormitory by *Yoji Akao, Ph.D., Japan*. This paper reports using the Kano Model to find out how various functions and features of a dorm facility are being perceived differently by the student residents and their parents and how this finding can be used in the planning stage of a QFD project. Dr. Yoji Akao, Ph.D., founder of QFD, in presenting this research by his students, discusses how you can integrate QFD and the Kano Model to create customer delights in your product and service.

LIFECYCLE 2007

Fusion of QFD and PLM by *Tadao Nakamura, Dassault Systemes K.K., Japan*. This paper introduces the fusion of QFD and PLM to aim the smooth and quick digital simulation in the concept stage of the product development. At first, PDM to manage the criteria and standard of various areas made by QFD, then, 3D-CAD simulates various matters with using the specified and quantitative information from PDM seamlessly.

Applying Quality Function Deployment to the Product Life Cycle of an Aluminum Wheel Project by *Javaid M. Cheema, VP-QA, Molex Interconnect Inc. and Muhammad I. Hussain, Sr. Mfg. Engineer, General Motors, USA*. This study was based on a project for the design, development, production, and aftermarket service management of a cast aluminum wheel program for a Japanese OEM customer. This paper reports the application of QFD to all stages of a product life cycle.

LOGISTICS 2007

Requirements for Structuring of Logistic Demands in the Run-up to QFD by *A. Crostack, Ph.D., Robert Refflinghaus, Ph.D., Nadine Schlueter, and Katharina Noll of University of Dortmund, Germany*.

In order to develop a customer-oriented logistic facility, the marketing research and developer have to work together. They must take into consideration such requirements as the whole life-cycle identified through market research, in order to achieve optimum in both facility and service. This paper reports a study, conducted by the University of Dortmund Chair of Quality, that aimed to develop a procedure for structuring, analyzing, and displaying unsystematic requirements into a QFD structure in the development of such logistic facility.

METHODS INTEGRATION 2007

Design of the Product Development Process in Cooperation with QFD, TRIZ and Taguchi Method (II) by *Hiroyuki Okamoto, RICOH Engineering Process Innovation Center, Japan; Yoshiharu Isaka, IDEA Inc., Japan; Yukio Miyamura, SANYO Electric Evolution PJ Management Gr., Japan; Masaaki Todoroki, Q-teck consulting Co., Ltd., Japan.* This paper reports the second phase of a joint research which was first reported at 2006 International Symposium in Tokyo. This paper describes an integration flow illustrating the authors' concept for fusing QFD, TRIZ, and Taguchi method by the "function" of a product, a common thread identified among the three techniques, and a hypothetical case study using this technique.

A Framework of e7-QFD as the 3rd Generation QFD in Japan by *Kazushi Nagai and Tadashi Ohfuji of Tamagawa University, Japan; Kei Inayoshi, Asahi University, Japan.* At the 11th and 12th International Symposium on QFD, the authors proposed a new framework called e7-QFD (evolution 7-QFD) which unites QFD with new quality control tools such as statistical method, strategy plan, and Taguchi method. Seven techniques had been independently treated in the proposed e7-QFD method so far. This paper will report this continuing research and explains the causal relationships of the techniques as well as systematization of e7-QFD.

QA-QFD — The making method in the Quality Table which can be Utilized by *Masaaki Todoroki, Consultant, Q-teck Consulting, Co. Ltd., Japan.* In QFD, the Quality Table is an important tool. However, misuse and misconstruction of this table are not unusual, often due to inadequate understanding of the required quality and customers. This paper and presentation will explain how to correctly make the Japanese Quality Table and better utilize it in product development.

PROCESS INDUSTRY 2007

Multiple Progression QFD: A Case Study of Cooking Product Functionality at Arla Foods by *Thomas Lager, B&L Innovation AB (blinab), Sweden; Åsa Kjell, Project Manager Innovation, Arla Foods, Sweden.* This paper reports a project at Arla Foods, the largest dairy company in Europe. The objective was to advance knowledge of how the production process and ingredients could influence the cooking functionality of a certain dairy product and how to measure such product properties, so that this knowledge could be used in subsequent product developments/improvements. QFD methodology was used to guide and structure the information-gathering processes and to link individual sub-project information. A new lean QFD project management approach which the authors developed for process industry and tested will be discussed.

SOFTWARE / IT 2007

An Application of 'System's Near Decomposition' to Software Structure Analysis by 'T2T' Tool for QFD by *A. Amemiya; T. Kuroda; M. Yoshikawa; Y. Watanabe, Ph.D.; H. Shindo, Ph.D. of University of Yamanashi, Japan; Y. Anang, Sync-Information System Co., Japan.* Using "Object-Oriented Design" concept, a software tool for QFD can be described as a table made of "function" and "component" viewpoints in the integrated software development environment "Delphi". Authors applied the processes of nearly decomposing a system to the QFD's Quality Table by using "QM3 (Quantification Method III)" in order to decrease the complexity. As the result, the structure of the software tool became more understandable and some design problems have been identified, leading to a re-design of the software tool structure and better design.

IT Service Deployment by *Wolfram Pietsch, Ph.D., Aachen University of Applied Sciences, Germany.* If IT is reduced to a fundamental technical commodity like a power supply, its business value will degrade ('IT doesn't matter'). In order to survive the outsourcing battle, full potential IT service must shift their focus to the business requirements and needs of their customers. This paper shows how a QFD framework can be utilized in the IT business in order to develop customer-focused products and services encompassing customer requirements, performance criteria, and functions to process improvements.

QFD-based Method to Choose a Suitable CAQ-system by *Robert Refflinghaus, Ph.D., University of Dortmund, Germany.* Choosing a suitable Computer Aided Quality (CAQ) system is an important decision for an enterprise. It requires high investments in costs, time and manpower, and therefore, a sound and rational decision process is very important. To support this, we have developed a QFD-based instrument for selecting a CAQ-system. The aim of this instrument is to reduce the choice of CAQ-suppliers from about 100 to three to five.

QFD in the Development of a WIKI: A QFD-WIKI by *Georg Herzwurm, Ph.D. and Sixten Schockert of Universität Stuttgart, Germany.* A wiki is a web based software which allows all visitors of a website to change its content by editing the site online in a web browser. With this key capability a wiki is an easy to use platform for collaborative working on hypertexts. This paper is about the development of a wiki on QFD and all its aspects as the content of the website. The so called QFD-Wiki is not only on QFD, it is also developed using QFD as the product planning method.

SECURITY 2007

KEYNOTE: QFD and Knowledge Management: QFD Application on the Development of a Finger Vein Authentication Device by *Akao Yoji, Ph.D., Yamagata University, Japan.* Founder of QFD methodology, Dr. Yoji Akao will present a case study on the development of a new finger vein authentication device using the state-of-art near-infrared light transmission technology by Hitachi Omron Terminal Solutions, Ltd. QFD and Knowledge Management were applied to understand the customer needs of a medical application. And then, this knowledge was used to develop a brand new product for the financial and security industries, enabling the company to enter the new markets successfully. The presentation will show the entire flow of the QFD project, how knowledge management fits into the process, as well as new technology deployment. The product was released into the Japanese market just last year with great success.

TELECOMMUNICATIONS 2007

Route of the Quality Model: Translating the Voice of the Customer in Process Improvement *by Edmundo Eutrópio Coelho de Souza, Telemar Norte Leste S/A, Brazil; Rosangela Maria Pereira Catunda, Pontificia Universidade Catolica, Brazil; Claudia Massena Barbara, Pontificia Universidade Catolica, Brazil.* This paper presents the Telemar Norte Leste – TNL Route of the Quality model, describing the methodology, step by step application process, and the main results achieved. The Route of the Quality is a QFD-based methodology developed to implement actions for improving customer-perceived quality. It is followed by surveys to measure the customer satisfaction and link the important indicators to the customer focus, strategic objectives of the company, regulatory frameworks, and establishment of goals that portray the reality of the company.

The Improvement of Telecom Service Quality Based on QFD *by Wei Xiong and Jun Xia, ZheJiang University School of Management, China.* This paper proposes application of QFD-based Telecom Service Quality Improvement Model (TSQIM) to Chinese telecommunication service. TSQIM analyzes service requirements of telecom customers and translates these requirements into telecom quality characteristics through use of HOQ (House of Quality); a series of HOQs can be used to design an optimization program for the network quality, to improve telecom service and increase customer satisfaction. The model has been applied to the PHS network business of Lishui Telecom Company.