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Conjoint Analysis 1996

Conjoint Analysis - A Useful Tool in the Design Process *by Professor Bo Bergman, Fredrik Ekdahl, and Anders Gustafsson of Linköping University (Sweden).* This paper presents conjoint analysis as a tool to help elicit customer's priorities. It illustrates a possible work flow for conjoint analysis and provides an example of the information collected.

Reposable Medical Device Development - Creatively Meeting Customers' Needs (Applied Conjoint Analysis & QFD) *by George J. Marcel, Heidi Youngkin, and Bob Anthony of Guidant - Origin Medsystems, Inc. (USA).* This case study provides the initial results on integrating marketing and quality tools in a medical device application - a reposable (partially reusable, partially disposable) instrument used in Minimum Invasive Surgery. It addresses how use of combined disciplines can provide an improve product that meets or exceed the customer requirements in quality, cost, and timing.

Construction 1996

QFD in Building Design *by Petri Laurikka, Antti Lakka, and Mikko Vaino of VTT Building Technology (Finland).* Rapid and quality completion of buildings tailored to individual needs of customers is setting new challenges to methods of building design. Success in temporary project organizations may require systematic working procedures and appropriate tools. This paper reports three construction projects that applied QFD as a team decision-making tool to listen to the voice of the customer to achieve common understanding, consensus, and commitment in design objectives and design solutions. The depth in which QFD was applied followed the tradition of the construction industry - "quick and dirty." Nevertheless, the result were encouraging: QFD provided a systematic method for the analysis of the customer demands. Each case project resulted in several design changes that were appreciated.

QFD on a Construction Project Process for a Multi-compartment Silo *by Luiz Roberto Prates of M. Roscoe S.A. Engineering (Brazil).* This paper reports a construction project of a multi-compartment silo for a cement industry that used the QFD processes. The main objective was to assure quality as well as reduction in project time and cost. The project team was composed of a civil construction company, project office, mechanical assembly company, and the cement company (the client). The relationship among the phases of civil construction methods, control parameters, mechanical assembly, and the silo project quality characteristics were analyzed. New solutions and execution methods were developed.

QFD in Building Construction *by Syed M. Ahmed and Roozbeh Kangari of The Hong Kong Polytechnic University (Hong Kong) and Roozbeh Kangari of the Georgia Institute of Technology (USA).* This paper proposes a QFD model for the construction industry which consists of: 1) Client Requirements Diagram that identifies the top, intermediate, and basic client satisfaction events; 2) Responsibility Matrix which identifies clients, architects/engineers, and contractors responsibilities; and 3) Quality Charts based on the necessary and sufficient conditions required for quality work in planning, design, and construction. The model can be applied to keep track of the interdependencies and interrelationships of different parties involved in the industry. By closely monitoring these complex and often grey areas of responsibilities, a continuously improving process can evolve, ultimately resulting in increased client satisfaction.

Design of Experiments 1996

QFD Implementation in DOE *by Dr. Eli A. Glushkovsky of TelRad (Israel).* At the stage of DOE planning, QFD may successfully provide: Cause-and-Effect Diagram analysis, selection of appropriate factors and number of actor levels, choice of DOE type and resolution. At the state of DOE execution, advanced QFD makes it possible: 1) to create visual models based on expert rules such as "if factor A is high, then response variable is low"; 2) to apply three models for "what-if" simulation and optimization.

Electronics 1996

Product Development System Using QFD and Other Methods at Kinpo Electronics *by Jyh-Ren Yang and Chen Hsiu Li of the China Productivity Center (Taiwan).* Kinpo Electronics, one of the world's leading manufacturer of calculators and facsimile machines, used QFD to construct a product development system of their own that would connect related activities through their 28 departments as well as shorten the product development cycle.

Improvement of Memory Product Development System Through Quality Function Deployment *by Ju-myoung Lee, Semiconductor Business, Samsung Electronics Co., Ltd.* Samsung began QFD in 1994. In the second application project, a small cross-functional team was composed to complement the development system of the memory products and to reduce the development time through defining the requirements for product development and systematizing QA activities. This paper presents a Comprehensive QFD project within the Samsung Semiconductor Business.

Food 1996

Exploring a New Market for Sausage Using QFD *by Francisco M. Ormenese, et al of Sadia Concórdia (Brazil).* This study was to develop a new fresh pork sausage for the southern areas of Brazil. Through qualitative consumer research and supermarket supervisors direct interview, consumer and market needs were identified. Good understanding of these needs simplified prototype development. The quantitative consumer research found the newly developed prototype obtained superior performance in comparison with the product of the main competitor. The consumer voice was efficiently translated to the QC process chart using QFD methodology.

Food Product Upgrade Using QFD *by Ioanis Athanase Sarantópoulos et al of of Sadia Concórdia (Brazil).* Sandia, the largest meat processor in Brazil, used QFD to regain market share, reduce costs and improve intrinsic quality of the product as perceived by the consumer. The conceptual model was developed viewing the production flow process from downstream to upstream, starting with the quality characteristics of raw materials, followed by quality characteristics of auxiliary raw materials, of intermediate products, and finally , of the finished product. The final response of consumers after launching the product clearly indicated fulfillment of the proposed goals and the benefits of QFD method for the company.

Bagel Sales Double at Host Marriott with QFD *by Steve Lampa, VP Quality of Host Marriott and Glenn Mazur of Japan Business Consultants, Ltd. (USA).* Three recent trends have lead to changes in the way travelers view airport food: 1) Healthier and lighter food; 2) more women travelers; and 3) fewer on-board meals being served. Host Marriott, which operates 70% of the U.S. airport food and beverage market, wanted to assure that its product offering were keeping up with customer demands. What they discovered was that their traditional approach to new product and service development was penny profit driven and not customer focused. QFD was employed to make quality and customer satisfaction more important. Within one month of completion, sales doubled.

General Industry 1996

The Keys to Successful Selling of QFD: Helping Management Choose to "Do QFD" *by Diworth Lyman of Viewpoint & Understanding Enhancement (USA).* Successful use of QFD on a company-wide basis requires a significant commitment of resources. This paper addresses the issue of getting management buy-in to QFD by selling QFD as a solution, not just a new technology.

Strategies to Implement QFD in the Basque Country of Spain *by Mikel Sorli and Alberto Gomez Telletxea of LABEIN (Spain).* The implementation of QFD in Spain, and in particular in the Basque Country has been slow and without the expected successes. A new strategy based on the synergy between Quality Assurance System ISO 9000, is doing the QFD process backwards, starting with manufacturing and ending with the House of Quality or A-1 Matrix. At first look, this flow is completely opposite to the current view of QFD, but the reason is found in the early beginnings of QFD.

Customer and Product Profiling in the "Fuzzy Front End" *by M. Larry Shillito of Kodak (USA).* Company and customer focus are too often lacking in the front end of the commercialization process. This causes significant downstream course corrections which increase unit manufacturing cost, extended cycle time, and offset the balance between company and customer needs. This paper proposes the Customer Profile and Product Profile, two front-end, macro-level converging tools to focus product and projects, that can can be applied before application of QFD, to reduce mid-stream design engineering process changes.

How to Connect Technology Seeds to Customer Needs *by Dr. Kozo Koura of Asahi University (Japan).* "Seeds" is defined here as a material or technology that was developed based on the social and technological trend forecast (anticipated needs) or in the course of R&D. This research paper discusses "Seeds-derived QFD," a focus of a research committee at the Japanese Union of Scientists and Engineers since 1988.

Conflict Management in Design *by Stephan Jacobs and Michael Gebhardt of Ericsson Eurolab Deutchland (Germany).* Conflicts are not necessarily destructive. They motivate, stimulate, and initiate improvement. Effectively managed, conflicts are a necessary precondition for creativity. This paper presents a conflict management theory and a toolkit for conflict management support that are based on the QFD principles.

Product Differentiation Through QFD *by Robert Hales of ProAction Development, Inc. (USA).* QFD teams should use QFD to create product differentiation by avoiding certain failures. This paper discusses the benefits and how to use QFD in product development to create differentiation from competitors.

Why QFD Fails and What to Do About It *by Gershon Blumstein, EDS.* Many individuals would like to view QFD as just another management fad. This paper proves that this perspective is seriously flawed. As a methodology to support Concurrent Engineering, QFD is even more critical than it was originally introduced in North America. This paper explains the common mistakes that organizations make in implementing QFD and provides guidance to avoid those mistakes.

Integration of Total Quality Methodologies with Simultaneous Engineering Concepts in a Comakership Frame *by Mikel Sorli and Alberto Gomez of LABEIN (Spain).* This paper is on the importance of rapid reaction to market requirements and meeting or exceeding customer expectation and reducing lead time and cost. Based on experience developed from 1993 to 1995 within the frame of a Brite European Project.

Healthcare 1996

A Customer Integrated Decision Making/QFD Project *by a Multi-function Team of Health Care Providers Planning a Treatment System for Adults with Attention Deficit Disorder (ADD) by Douglas W. Penz, PhD, Judith Daniels, MD, Thomas E. D'Erminio, LISW, BC, and Bill Barnard, BS, CS, CPIM (USA).* A team including a physician, clinical psychologist, and clinical social worker is using CIDM/QFD to identify customers and their needs for treatment of adult ADD. The treatment facility is expected to open in the summer of 1996.

Information Systems 1996

IT Support for QFD: An Innovative Software Concept Providing Project Management and Team *Tools* *by T. Pfeifer, Albert Neumann, Robert Grob of Laboratory for Machine Tools and Production Engineering, University of Technology in Aachen, Germany.* This paper describes a new and innovative IT approach to support QFD efforts. Deriving from observation of failed QFD projects in Europe, the paper proposes factors for a successful QFD implementation and shows the general software concept for project management and team tools.

***T*he Role of QFD in Quality Information Systems** *by Syohei Ishizu of Aoyama Gakuin University and Noriharu Kaneko of Service Quality Management (Japan).* Information systems and databases are important to product planning, design, manufacturing, etc. QFD can be used to help construct those systems.

Manufacturing 1996

QFD in a Brazilian Steel Company *by Carlos Augusto de Oliveira of Belgo-Mineira Steel Company (Brazil).* One of the largest Brazilian manufacturers of wire rods and drawn wires used QFD to reduce costs and increase market share in rods and bars for car suspension springs. Matrices of quality, cost, reliability deployment, FMEA, Taguchi Methods and regression analysis were combined. This effort resulted in 23% cost reduction, 90% customer complaints, and a steady increase in market share.

QFD at Kawasaki Heavy Industries *by Susumu Yamamoto, Kawasaki Heavy Industry (Japan).* Kawasaki, a major manufacturer of heavy machinery, ships, vessels, cars, motorbikes, and plant equipment in Japan, presents their their unique approach to QFD with special focus on product liability and safety through improvement of the upstream design quality. Exemplary QFD charts are included.

Beyond the First Chart: QFD for Process Improvement *by Mike Graetz of 3M Tape Manufacturing Division.* This presentation demonstrates some techniques especially useful for process industries and improving the existing product and process. Specifically, the QA/QC planning chart, process stage chart, and process control strategy charts are proposed, and their purpose and usage are explained.

How to Apply the Power of Computing to the QFD Process *by Karla Kuzawinski, Xerox Corp. (USA).* Implementing QFD requires collection, distillation, and organization of many sets of data. This paper presents recommendations on when to consider and how to use computers to support various parts of the QFD process. Not all aspects of the process should be automated since group discussion and interaction is a very valuable part of developing a common level of understanding of customer requirements. The recommendations in this paper also include a look at existing off-the-shelf computer tools that can be applied to QFD and thoughts on other aspects of QFD team support.

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Medical Device 1996

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Reliability 1996

QFD and Product and Process Reliability *by Ian Ferguson of Ian Ferguson Associates (United Kingdom).* This paper shows how post-House of Quality data can be used for reliability, test planning, and risk analysis with such tools as Fault Tree Analysis; how it can be used with experimental design, product and process design to ensure robustness to uncontrollable events. The point is illustrated using examples from automotive, health care, and software engineering industries.

Service 1996

QFD Implementation in Hospital Housekeeping Services *by Noriharu Kaneko of Service Quality Management Ltd. (Japan).* One of the greatest threats to patient health is infectious disease. Hospitals must go to great lengths to see that disease does not spread from one patient to the next. Mr. Kaneko, one of the first to apply QFD to services, shows how his company is pursuing ISO9000 compliance to assure cleaning crews to the job right the first time.

Bagel Sales Double at Host Marriott with QFD *by Steve Lampa, VP Quality of Host Marriott and Glenn Mazur of Japan Business Consultants, Ltd. (USA).* Three recent trends have lead to changes in the way travelers view airport food: 1) Healthier and lighter food; 2) more women travelers; and 3) fewer on-board meals being served. Host Marriott, which operates 70% of the U.S. airport food and beverage market, wanted to assure that its product offering were keeping up with customer demands. What they discovered was that their traditional approach to new product and service development was penny profit driven and not customer focused. QFD was employed to make quality and customer satisfaction more important. Within one month of completion, sales doubled.

Experiences from QFD Techniques in Service Development *by Niklas Hallberg and Toomas Timpka, Linkoping University, Sweden.* This research paper presents a study on the impact of QFD in services and development of a QFD model for service department. The use of QFD in service development was evaluated in three project experiences: Development of customized socio-medical services, development of computer support for teamwork at primary health care centers, and determination of support methods for participatory design projects. The result showed the House of Quality and QFD were useful in service development.

Software 1996

Developing Multimedia Integrated Circuit Solutions Using Customer Integrated Decision Making (CIDM) *by Carrie Richardson of Motorola (USA) and Bill Barnard of Barnard-Norman Associates (USA).* This is a case study involving an

internationally located team using CIDM to interview customers and focus on value and choice in order to arrive at technical specifications for multimedia solutions, leading to the development of an integrated circuit, its software and development tools.

Measuring the Success of a QFD Project *by Dr. Georg Herzwurm of The University of Cologne (Germany).* A QFD pilot project with the biggest German software house, the SAP AG, included the development of a method for measuring the success of QFD. This method is based on a structured questioning of all project members concerning their personal factors of success and attitudes before and after the QFD.

Making the Millennium Decision: Applying QFD to the year 2000 Century Change *Issue by William J. Jagrowski, Andersen Consulting; Robert L. Pike, Consumers Power Company (USA).* The century change date poses one of the greatest development challenges ever for software engineering. Literally, billions of lines of software code will have to be evaluated and extended pulling developers away from developing new software products. This lost production may never be regained. QFD has helped a major utility develop its strategy for next few years to cope. The case study offers an example of how QFD and the analytical hierarchy process (AHP) techniques can be used to facilitate a decision facing a company grappling with legacy system obsolescence, including the Year 2000 problem.

QFD Software 1996

How to Apply the Power of Computing to the QFD Process *by Karla Kuzawinski, Xerox Corp. (USA).* Implementing QFD requires collection, distillation, and organization of many sets of data. This paper presents recommendations on when to consider and how to use computers to support various part of the QFD process. Not all aspects of the process should be automated since group discussion and interaction is a very valuable part of developing a common level of understanding of customer requirements. The recommendations in this paper also include a look at existing off-the-shelf computer tools that can be applied to QFD and thoughts on other aspects of QFD team support.

A Computerized Database to Assist QFD *by Larry A. Stauffer and Linda J. Morris, University of Idaho; Dileep V. Khadilkar of Project Advisors International. Ltd.* Based on QFD, a computerized database was developed to assist design teams with the product definition process. The database provides a framework for eliciting and managing customer information, the associated engineering information, and the resulting product specifications. A the heart of the database is a taxonomy of consumer and manufacturing issues. A case study of an industrial application is presented along with experiments to validate its usefulness.

Strategy 1996

Building and Sustaining an Industry Leader with QFD *by Robert Hunt of Macquarie University Graduate School of Management and Fernando Xavier, Deve Hydraulic Lifts Pty. Ltd. (Australia).* After finding their TQM activities were running out of steam and lacked focus and fearing increased competition, Deve Hydraulic Lifts Australia (DHA) adopted a QFD-like approach to setting corporate strategy and aligning all the major improvements of the organization toward achievement of the vision. Gemba visits by the DHA's top management team and multiple matrices and function trees were used.

Applying the Power of QFD to Strategic Planning *by Karl Hummel of The Change Factory (USA).* In the past three years, the Change Factory applied QFD to a variety of planning tasks ranging from service design to strategic planning. This paper discusses the application of QFD to the creation of a strategic plan for the University of Vermont so that it can be initiated across all departments and functions.

Taguchi Method 1996

A Robust Quality Design Model that Integrated QFD and Taguchi Methods *by Yann-Fang Chu of National Defense Management College (Taiwan).* This paper proposes a two-phase robust quality design model and process that integrates enhanced QFD and parameter design. It uses QFD to be the transformation and communication interface of customer's requirement and system design. It also uses AHP to evaluate the character importance of the requirement and analyze the major quality character and related design parameters. It then uses the experiments of Taguchi Methods to get the optimal sets of robust quality design or to revise the value of requirement goal in accordance with the major quality character.

Telecommunication 1996

Motorola's Six Pack QFD Total Customer Satisfaction Team *by Fred Stickel, Sherry Bosserman, John Forsberg, and Fred Stickel of Motorola, American's Parts Division, Land Mobile Products Sector (USA).* A case study for a Motorola Total Customer Satisfaction Team for the America's Parts Division, this project focused on improving unacceptable customer satisfaction ratings in the areas of product and pricing information for the company's aftermarket components. Voice of customer analysis yielded seven critical misinterpretations of customer needs. Today, customers are 60% more satisfied.

TRIZ 1996

Enhancing the Value of the Correlation Matrix through Utilization of the Theory of Inventive Problem Solving, TRIZ *by Dana W. Clarke, Sr. of Ridge Tool Co. (USA).* This paper shows how correlations in the roof of the House of Quality can be used to enhance innovation and how this can lead to significant innovative opportunities.

TRIZ/Ideation Methodology for Customer Driven Innovation *by B. Zlotin, A. Zusman, S. Malkin, L. Kaplan, G. Zainiev, S. Vishnepolskaya, V. Oleynikov, V. Prosyanic of Ideation International Inc.* The purpose of this paper is to introduce and provide understanding of the TRIZ/Ideation Methodology to QFD theoreticians and practitioners and how this method can be applied to the QFD process. It contains an overview of the main tools, problem formulation process, system of operators, anticipatory failure determination, and directed product and process evolution.