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Aerospace 1991

Using QFD with Dynamic Customer Requirements, *J. B. ReVelle, Ph.D., Hughes Aircraft Company.* Existing explanations of QFD presume that the customer importance value for each of the customer requirements are constant. Recognizing that customer requirements are dynamic and cannot be controlled by a supplier, this paper uses the Taguchi inner-outer tableau to achieve a robust requirements matrix. A simulated case study has been created to demonstrate the methodology.

Automotive 1991

Overview of Quality Function Deployment, *R. J. Dika, Chrysler Corporation.* Within the community of quality and reliability professionals, there has been an explosion of interest in QFD, study and discussion on the subject. This paper presents in a global way, a statement of what QFD is and a brief description of its universal elements, essential principles, and mechanics and definitions, with intent to set a common starting place for all Symposium participants.

Concept Development Through Teamwork - Working for Quality, Cost, Weight and Investment, *Robert J. Dika and Ray L. Begley, Chrysler Corporation.* This paper resents a method for developing a product design and manufacturing process concept, before project final approval, which integrates several other methodologies and uses cross-functional teams. It is a method for completing a "paper" study which quickly considers many of the downstream stems of product development, which will be conducted in greater detail later. It results in a selection of the best design and process for the overall product application and supports this selection with sound numerical targets for quality, cost, weight, investment and process capability.

Application of a QFD and Other Quality Tools to a Trunk System, *Bill Biondo, General Motors.* A QFD application case study presented by General Motors. The project goal was to produce a quality trunk system which meets or exceeds the customers expectations by understanding the customer's requirements, and the resulting product, process and production floor requirements. The process began with the VOC, translation of the voice into product characteristics, and assessment of strength of the characteristic relationships. Competitive benchmarking was done to determine the priority of each characteristics and the level of complexity. The processes continued from system to component to process to production floor. At each level, the critical elements were focused on and studied.

Computer 1991

Requirements Gathering Techniques Used with Quality Function Deployment, *A. I. Sharkey, IBM Corporation.* Presentation slides on four basic steps in gathering wants and needs, cross-functional management system, VOC process, account selection guidelines, customer input gathering and analysis, etc.

General Industry 1991

Getting the Voice of the Customer, *Glenn H. Mazur, Japan Business Consultants, Ltd.* Presentation slides. What is the Voice of the Customer?; Who is the customer?; When to get VOC?; How to use VOC data?; and VOC Table samples.

The Hows, *R. F. Hales, International TechneGroup.* Presentation slides. The House of Quality or Product Planning Matrix; Purpose; Guidelines; Types; Sources; Problems; Results.

Total Quality Management and Quality Function Deployment, *S. Ungvari, American Supplier Institute.* This paper discusses 1) What is TQM?; 2) What is QFD?; 3) Dynamic TQM; and 4) QFD and the TQM Tools.

Comprehensive QFD System, *Satoshi "Cha" Nakui GOAL/QPC.* Comprehensive QFD system is detailed in this paper by one of the students who studied directly under Dr. Yoji Akao, co-founder of QFD, in Japan. It includes Voice of Customer Tables, how to enter data, what is demanded quality, rules, demanded quality deployment, function analysis, function deployment, failure mode analysis, reliability deployment, concept deployment, capability deployment, plus many example charts and matrices.

Building QFD into a Comprehensive Product Development System for Competitive Advantage, *C. Nicholson, Oregon Cutting systems Division - Blount Inc.* The international construction and manufacturing company describes how they began QFD to bring customer focus to their improvement activities and shift to "market in" approach from "product out" thinking which they traditionally held. The strategic product development system resulted, achieving measurable improvement in their product development and market share.

Filling in the Blanks: QFD & Technical Optimization, *J. Quinlan, ITEQ International, Ltd.* The work of Dr. Taguchi offers technical theories and processes that provide the methods by which technical personnel can accomplish upstream development work that leads to high performance products downstream. It provides technical concepts and processes by which the real benefits of QFD and concurrent engineering can be realized. Using a toy suction cup dart gun as an example, the paper explains how this can be done.

Structured vs. Non-Structured Approach to QFD, *W. H. Slabey, American Supplier Institute.* Presentation slides on the key customer demands, myths about QFD, and American Supplier Institute (ASI) approach to QFD vs. GOAL/QPC approach to QFD.

Using the QFD Concept in Non-Product Related Application, *R. G. Day, Total Quality Management, Inc.* People who have used the QFD concept for product planning frequently find that the QFD matrix concept has natural extensions to other planning applications. This article explores a few such examples of the use of the QFD concept in non-product related applications based on the experience of several organizations.

Concurrent Engineering a Harris - Lessons Learned, *J. A. Lugo, W. J. Vitaliano, J. S. Lutz, Harris Corporation.* During the 1990 fiscal year, the Concurrent Engineering Team of the Corporate Engineering Productivity Group at Harris set an ambitious goal: the creation of a concurrent engineering training course, including QFD methodology, and the initiation of two concurrent engineering pilot projects. The goal was successfully met and exceeded, and seven pilot projects were started. This article summarizes Harris experiences and future plans.

QFD Assumes You have an Imagination, *J. Terninko, Responsible Management.* A skilled QFD practitioner is not restricted by ASI's four-phase approach or GOAL's matrix of matrices. The examples from actual cases which are presented in this paper use neither approach. They do use Taguchi's loss function in the house of quality for technical evaluation. Product mix is selected by simultaneously looking at market segments and needs.

***Enhancements to the QFD Process**, E. H. Vannoy, P.E., Product Engineering & Reliability Engineering Consultant.* Presentation slides on QFD study, product planning matrix, paired comparison matrix, QFD matrices.

Before the House: The Voices of the Customer, *Richard E. Zultner, Zultner & Company.* An approach is presented for applying QFD to complex products and services with multiple types of customers. This "customer deployment" occurs before the A-1 or "House of Quality" matrix. In addition to enhancing the ability of developers to hear the "voices of the customers" more clearly, a more accurate deployment of weights can be accomplished by the consistent use of ratio scales, such as produced by the Analytical Hierarchy Process (AHP) throughout QFD. The figures presented also illustrate the mini-matrix method - a series of simple matrices and tables providing an easy-to-learn but very extensive, tailor-able structure for QFD. some guidance is provided for applying these concepts to the A-1/House of Quality itself, and beyond.

Who Needs QFD User Groups? *R. Norman, R. F. Hales, D. Lyman, International TechneGroup.* QFD is rapidly becoming a powerful decision-making process in many business. Much has been written about QFD, what it is, how it works, and its benefits, but practical case studies are not usually published. This is primarily due to the fact that companies consider the QFD data highly proprietary. One approach to a more open sharing of implementation information is to form localized user groups. This paper discusses the concept, same examples of how user groups have been started successfully and the implications for QFD's future.

Amplifying the Voice of The Customer, *M. C. Lyons, J. A. Alexander, Impact Group, Inc.* QFD has achieved its most dramatic applications in the world of heavy manufacturing. From the VOC to translating that through cascading houses of quality into the shop floor, the QFD process has been thoroughly tested, documented, and proven. However, the roadmap for the trip back to the customer, i.e., how it convinces the customer that it is worth the money asked, is largely unmapped. This paper focuses on the use of Voice of the Customer information within the more traditional "telling and selling" role of marketing and sales. It gives concrete examples of how marketing and sales assess broad customer expectations in a simple "report card," and then utilize that information to correctly "position" in the customer's mind the value of the products and services that the selling organization already delivers.

Manufacturing 1991

QFD Study of CATV Connector, *M. Liner, Raychem Corporation.* QFD offers significant benefits as a tool for bringing new products efficiently to market and increasing customer satisfaction. This paper describes a product development team's use of QFD on an indoor coaxial cable connector for the cable television market. Both the 4-Phase and the Matrix of Matrices approaches are used. A summary of the team's evaluation outlines advantages, key problems, and suggestions for future work with QFD. Significantly higher customer satisfaction at product introduction resulted from using QFD.

Medical Device 1991

The Strategic Approach to Market Research, *D. A. Ginder, Mech Group, Inc.; N. Donforio, G.E. Medical Systems.* This paper discusses a new approach to market research using QFD to focus research activities on Key Customers and how GE Medical applied the tool. Systematic definition of company requirements, focused market opportunities, customer definition, and customer requirements become the driving factors for new product development or validation of an existing product line. This approach enables Marketing to perform research which is more meaningful, economically focusing resources on customers with the greatest potential opportunity to meet the company's long and short term goals. This strategic approach to is replacing the more traditional market research approaches such as conjoint analysis, which are more of a statistical shotgun.

Software 1991

Quality Function Deployment to Gather Customer Requirements for Products that Support Software Engineering Improvement, *J. Moseley, J. Worley, Texas Instruments.* During late 1990s and early 1991, the QFD process was used to gather customer requirements for products to support software engineering process improvements for Texas Instruments. These requirements were compressed into twenty customer need categories and were given the priorities as received from the customer using the QFD process. These needs were further developed into twenty-two measurable characteristics, which were then analyzed and five key characteristics were identified for further development. The QFD process provided an effective means of gathering and categorizing customer requirements for software engineering process improvement products.

Electronic Exchange of QFD Data, *R. F. Hales, D. Lyman, R. Norman, International TechneGroup.* The time has come for vendors of QFD software to establish a common exchange format. This paper discusses the requirements for this type of standard. It also proposes a preliminary format.

Generalized Approach to Adapting QFD for Software, *A. I. Sharkey, IBM Corporation.* Presentation slides on QFD approach used in IBM, QFD software translations, QFD software samples charts, market segmentation and QFD deployment, and implementation at IBM.

Taguchi Method 1991

QFD & Taguchi for Design with Environmental Elegance, *Dr. C. M. Overby, Ohio University.* There is growing recognition that one of the best ways to reduce pollution and to minimize waste is to prevent them from happening in the first place. A most important place and time to carry out this "prevention" is when products and processes are first created - at the beginning of the design process. This paper illustrates how Taguchi and QFD ides, ideas about "defect prevention by design" have parallels in concepts of "pollution prevention and waste minimization by design," and how these "quality" ideas might help us move toward environmental elegance in design for the entire life cycle in engineering practice and education.

Voice of Customer 1991

Voice of the Customer Analysis & Other Recent QFD Technology, *G. Mazur, Japan Business Consultants, Ltd.* This paper details what is the Voice of the Customer, why it is important, and how it is gathered and analyzed. Other technologies and applications included in this paper are Kansei Engineering, QFD for regulatory and environmental compliance, QFD for chemical processes, and QFD for service industries.