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Automotive / Reliability 2003

QFD for Preventing Failure. *Masaaki Todoroki, Q-tech Consulting Co., Ltd., Japan.* Ever-changing product conditions have made traditional reliability activities less effective because it has become increasingly difficult to verify individual design values and process control values in a short term development. QFD has had a component of reliability deployment but often this is not put into practice. This paper proposes a method that combines FMEA and QFD to address this issue. The proposed method can predict failures and determine the design values and process control values through the use of a quality table, thus determining the conditions for failure prevention. The presentation will include description of the method and a case study of an automotive part development where the failure rate was decreased by one third by this method.

Concurrent Engineering 2003

QFD, MATE-CON and 3DCE - A Truly Collaborative Product Development Process. *Esteban Guerrero and David Stagney, MIT Leadership in Manufacturing Program, Mexico/USA.* Design engineers look at their supply base to design products, for they need to know their technical capabilities and the price. Concurrent engineering guidelines require companies to design products and processes concurrently. So, it is only natural to design product, process and supply chain simultaneously. That is the concept of 3DCE (Fine, 1998). After exploring the strengths and weaknesses of several tools, we developed an overarching framework that defines a 3DCE process. This includes QFD to best read customers' needs and translate stakeholders' requirements into attributes and MATE-CON (the Multi-Attribute Tradespace Exploration with Concurrent Engineering tool) to best conduct a tradeoff process among Engineering, Manufacturing, Marketing and other stakeholders.

Concrete and Construction 2003

QFD Application in Concrete Industry. *Emin Arca and S. Serdar Yoruk of Marmara University; and Esra Atac of Yeditepe University, Istanbul, Turkey.* QFD is used in improving as well as developing new products and services. This paper shows an application of QFD in the development of a new plasticizer product used in concrete production. The QFD team used the results of a survey applied to 17 plants in Turkey to prioritize the customer requirements and determine the focus areas of product and related services to achieve high market share and customer satisfaction. The customer's evaluations of the two competing firms were also taken into consideration. The project, their results, and lessons taken will be discussed.

Consumer Electronics 2003

Sensio - The Evolution of a Revolution: QFD Applied to the Development of New Businesses. *Pierre Routhier, Sensio, Canada.* Sensio's world's first Stereoscopic Home Theatre System was the fruit of a four-year effort in QFD and Value Management, which led to an instant success. Building on their earlier product development success, Sensio again set to invest in understanding and integrating the needs of its customers and partners. This case study will follow the different phases of this new product's development, and demonstrate the system developed by Sensio to define which needs are assessed at which stage of the development process to maximize the effectiveness of the marketing and engineering efforts.

Defense 2003

Using QFD to Select an Explosive for an Army Munition. *Richard Rhinesmith and Bruce Williamson, US Army Armament Research Development and Engineering Center, USA.* QFD methodology was used by a team from the U.S. Army's "Excalibur" 155mm artillery munition development program to down-select among several "Insensitive Munition" (IM) explosives candidates. This is a summary of the symposium presentation which discussed the lessons learned from conducting the "real world" effort, where issues such as safety, schedule, cost, expert judgment, and multiple customers and interests compete for supremacy. Was QFD a success in this application? Should it be used in something so specialized and potentially hazardous as the arcane world of explosives development and use? Should this be better left alone to the experts who use their traditional methods of haggling things out? These and other questions were addressed.

The Next Generation Explosive Ordnance Disposal (EOD) Robotic Controlled Vehicle: Using QFD to Define the Operational Analysis. *Bruno Eddy and Dave Schroeder, QFD Green Belt®, Applied Research Associates; and Glenn H. Mazur, QFD Red Belt®, Japan Business Consultants, Ltd., USA.* In this Operational Analysis (OA), QFD was used to identify and quantify DoD user requirements for the next generation EOD remote controlled vehicle. The OA data was obtained using joint armed service focus groups, surveys, and one-on-one interviews with 322 DoD unit-level EOD technicians. This paper presents the NGEODRCV Operational Analysis, including the methodology, process, and a prioritized list of seventy technical characteristics. This OA identifies user prioritized technical characteristics and desired abilities, and will aid program managers in identifying technology solutions and prioritizing developmental efforts for the Next Generation EOD Remote Controlled Vehicle.

Education, Online 2003

e-Learning System for QFD with improving contents and mentoring in "e-TQM" Project. *Masanobu Yoshikawa, Yoshimichi Watanabe, and Hisakazu Shindo of University of Yamanashi, Japan; Masao Takeshita of Japanese Standards Association; and Naofumi Takayama of SYNC Information System Co., Ltd., Japan.* This research examines the learning patterns of the students participating in the Internet-based e-learning programs in order to develop an effective online TQM course that provides both support and educational ease to the students, as well as evaluation formula and quality control. It examined these issues: (1) How to automatically collect data on students' learning process; (2) How to analyze the data so we can find ways to improve the content and learning; and (3) How to discourage students from retiring. The result is an e-learning system for an online TQM

course that alerts instructors when to update the contents, when to mentor students, and. The finding has been implemented in some of the online courses offered by the Japanese Standard Association.

Government / Public Sector 2003

Large Scale System Redesign Using QFD. *Robert Gerst, Converge Consulting Group Inc., Canada.* This paper will report QFD applications in the public sector large system design. It will describe the consulting firm's experience in using QFD to: 1) analyze and redesign the system of funding and service delivery in providing support for those living with HIV/AIDS in southern Alberta; and 2) analyze the entire social and health services (human services) system for the regional municipality of Wood Buffalo in Alberta; and 3) analyze and redesign the system for providing services to the deaf and hard of hearing in the city of Calgary. The resulting benefits and reactions of the local government agencies are also included in the report, as well as other potential areas of QFD application.

Adapting QFD for Evaluating Employment Initiatives. *Geert M.J. Clijsters, Limburgs Universitair Centrum, Belgium; Maurice J. Oude Wansink, OWP Research, The Netherlands; Ludo M.K. Peeters, Limburg University Centre, Belgium; and Wolfgang E. Baaske, Studienzentrum für Internationale Analysen, Austria.* QFD is applied to obtain quality scores for local employment initiatives, enabling them to monitor, evaluate and benchmark themselves. Calculating quality scores of products (employment initiatives), instead of identifying core quality characteristics (performance measures) expands the standard application possibilities of QFD. However, several methodological issues arise due to this extension of the methodology. In order to overcome scaling problems, the authors introduce a nonparametric approach to scale efficiency. Still, some other problems could not be solved yet within the framework of this research and are pointed out for further research.

QFD and Administrative Knowledge Management. *Yoji Akao, Ph.D. and Kei Inayoshi, Lecturer, Faculty of Management Studies, Asahi University.* This research paper proposes the use of Knowledge Management to accommodate the short and long-term needs of citizens. Traditional QFD tools such as Scene Deployment, Affinity Diagrams, AHP, and Quality Tables will be employed to identify and prioritize public sector job functions and detailed governmental tasks.

Information Technology/Financial 2003

Quality Infrastructure Improvement: Using QFD to Manage Project Priorities and Project Management Resources. *James LePrevost, QFD Green Belt®, National City Bank and Glenn H. Mazur, QFD Red Belt®, Japan Business Consultants, Ltd., USA.* National City Bank has applied QFD to help identify and prioritize the needs of the customers, and then used these findings to evaluate each IT project for its benefit contribution and degree of complexity to assign appropriate resources. This paper shows customization of the QFD process through the QFD Green Belt® training of the QFD Institute, development of a list of internal customer needs which became the criteria for determining project benefit, and further development of another set of criteria for determining project complexity and technical skill level required to work on the project. This case study demonstrates how IT projects can be prioritized and optimum human resource assignment can be determined through the use of QFD in order to deliver the greatest value to the customers.

Lean Manufacturing 2003

QFD application for tackling Internal Customers Needs as a base for building a Lean Manufacturing System. *Javier Santa Cruz-Ruíz; Francisco Tamayo-Enríquez, and Verónica González-Bosch, Mercadotecnia Estrategia Dirigid, Mexico.* In the fast-paced and lean economy that modern manufacturing nowadays has as its environment, we propose that the ability of applying QFD tools and principles along the whole manufacturing chain will turn critical, mainly because of 2 factors: (1) Lean Manufacturing allows no waste [1] and therefore, a complete match between resources and customer needs is required. (2) Rapid organizational redesign is needed to adapt to the ever-evolving customer needs and therefore company-wide understanding, alignment of purpose and common language (memes) are required. A successful application of an internal customer case will be presented as a reference for implementation.

QFD Theory / Math 2003

Linear Algebra for QFD Combinators - A Tutorial for QFD Practitioners: How to Combine Measurements with Deployments. *Thomas M. Fehlmann, Euro Project Office, Switzerland.* One of the most prominent tools in QFD is the matrix. Matrices are well known in mathematics as a means to represent linear mappings between vector spaces. We use similar matrices to represent cause and effect correlations. From this viewpoint we immediately face two questions: 1) Is the matrix invertible?; and 2) What does it mean when it is? On a more practical side, one might have this question: The matrices are constructed from the cause and effect relationships. Thus they represent a linear mapping from the solution space into the goal space. However, when calculating the solution weights, we use the matrix the other way round. Is this correct? This paper gives answers both from a mathematical viewpoint and from practical experiences.

Service 2003

Prioritizing Customer Needs at Spectator Events: Obtaining Accuracy at a Difficult QFD Arena. *Francisco Tamayo-Enríquez, Arnecom; González-Bosch, Mercadotecnia Estrategia Dirigid; and Javier Santa Cruz-Ruíz, Mexico.* Once customer needs are extracted from customer verbalizations and field observations, it is critical to understand the relevance that each need has to customers. Accurate information must come directly from customers, but sometimes due to the complexity of gemba this information needs to be obtained very quickly. Direct evaluation of needs without tradeoffs is easy to perform, but can lead to serious deviations from reality. On the other hand, comparison-based techniques such as AHP may be impossible to perform effectively at some gemba. An effective solution was devised by the authors while applying QFD for improving services at spectator events.

Six Sigma Integration 2003

Keynote: Integration of QFD into Design for Six Sigma. *Gregory H. Watson, Business Systems Solutions International, Inc., USA.* This is a collection of slides used for the symposium presentation describing a Six Sigma Design architecture that uses QFD to structure the design process and apply it as a program management tool across the entire DFSS process, making it the organizing principle and methodology hat links all tools and methods into a coherent whole.

The Integration of Comprehensive QFD, TRIZ, and Six Sigma in an Axiomatically Driven Total Product/Process Development System. *Michael S. Slocum, Breakthrough Management Group, and Ellen Domb, PGQ Group, USA.* This paper shows the math for TP2DS (Total Product/Process Development System) from the given condition of a societal need (SN) through the establishment of process variables (PV's).

Software 2003

QFD for Software Development Considering Future Design Risks. *Yuji Kyoya, Kunio Noguchi, Takashi Nakano, Tatsuhiro Nishioka, Software Engineering Center, Toshiba Corporation, Japan.* Many software systems suffer from the problems such as "frequent specification changes" and "functional requirement-biased Voice of Customers (VoC)." These problems cause future risks such as inconsistency in required specifications and increase in maintenance cost. Software-FMEA, based on traditional FMEA but it is also used to complement non-functional requirements, is proposed to avoid these risks during the phase of requirement analysis. The method aims to address the Voice of the Managers (VoM) by paying as much attention to it as we normally do to VoC, so as to ensure maintainability and fail-proof future expansion.

The Support of Quality Function Development by the Customer-orientated Evaluation of Software Tools. *Georg Herzwurm and Stefan Reiß, University of Stuttgart Information Systems, Germany.* This paper reviews available software tools and rates them on the basis of a customer orientated evaluation. The subjects of the paper are (1) a market survey of QFD software tools, (2) the development of a customer oriented evaluation, and (3) customer interviews on the basis of the customer-orientated criteria list which was formerly developed. The main issue of the research was the development of an evaluation system for rating the value of customer orientated software. The research was established in two stages; an overview of the customer requirements and the rating of customer satisfaction, together with two interview series with members of the QFD Institute Germany (QFD-ID) and international subscribers of the QFD-ID mailing.

Strategy 2003

QFD as a Model for an E-Intelligent Revolution. *Verónica González-Bosch, Mercadotecnia Estrategia Dirigida; Francisco Tamayo-Enríquez, Arnecom; and Javier Santa Cruz-Ruíz, Mexico.* In the Information Era, success will be of those who are able to think, learn, solve problems and take effective actions faster and better. Organizations must continuously maximize its Organizational Intelligence OI) to learn, and solve problems, and adapt in this dynamic competitive environment because people are discovering and inventing new ways to share relevant knowledge about a product or service at blinding speed. This paper proposes the concept of OI conceptual formula, Speed of change for adaptation capability (S), and organizational E-Intelligence, a fundamental element for E-Businesses success. Looking at a example of restaurant.com, a Mexican dot-com who uses QFD to develop core strategic decisions and redesign, the authors propose that QFD Systems can significantly increase E-Intelligence and help in the development of these characteristics.

Customer Driven Strategy: Solving the Fuzzy Front-End Using Outcome Based Segmentation and Innovation. *Robert Hunt, Ph.D., Macquarie University, Sydney, Australia; and Mike Walker, Customer Driven Strategies Pty Ltd, Brisbane, Australia.* What will give the organization a unique, valuable and sustainable position in the markets in which it decides to operate? Indeed what markets should it operate in? Most approaches to strategy are very weak on this "fuzzy front end". However, approaches to strategy using QFD principles provide a coherent methodology that has been successfully applied by many organizations both large and small. This paper focuses mainly on the issues in the fuzzy front end of strategy, and gives an overview of the rest of the strategy process.

Business Priorities and Quality Function Deployment: A Case Study. *Tan Kay Chuan and Vijayalakshmi Raghavan, Dept. of Industrial and Systems Engineering, National University of Singapore, et., al.* While Traditional QFD prioritizes the technical attributes of a product based on the voice of the customer, businesses often encounter unforeseen risks in executing these attributes. This paper integrates the two concepts of circle-of-control and the effort-impact matrix into QFD.