Basic concepts in quality planning and management

Business, Management

Quality Management (Basic Concepts) 1) What Is Quality? The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied — ASQ (American Society for Quality) needs. 1. 2. 3. 4. 5. 6. 7. 8. Performance Reliability Durability Serviceability Aesthetics Features Perceived Quality Conformance to Standards Will the product do the intended job? How often does the product fail? How long does the product last? How easy is it to repair the product? What does the product look like? What does the product do?

What is the reputation of the company or its product? Is the product made exactly as the designer intended? Quality Management Slide 2 of 35 1. 1 Components of Quality Customer Quality of Design Product Features vs Customer Requirements Requirements Performance Quality of Specifications Sales and Marketing Product Specifications vs Product Features Quality of Conformance Features Product Product Characteristics vs Product Specifications Design Manufacturing Quality of Performance Product Characteristics vs Customer Requirements Specifications Quality Management Slide 3 of 35 1. 1. Voice of the Customer The term Voice Of the Customer (VOC) is used to describe customers' needs and their perceptions of your product or service. VOC data helps an organization: • Align design and improvement efforts with business strategy. • Decide what products, processes and services to offer or enhance. • Identify critical features/performance requirements for products, processes and services. • Identify key drivers of customer satisfaction. Quality Management Slide 4 of 35 1. 1. 2 Kano's Model of Customer Needs Performance Quality Satisfiers Excitement Quality Noriaki Kano

Delighters Basic Quality Dissatisfiers Quality Performance Quality Management Customer Satisfaction Slide 5 of 35 1. 2 Quality is Customer Satisfaction Supplier Metrics • Cycle-Time Customer Needs • Timeliness • Cost • Price • Defect Rate • Quality Quality Management Slide 6 of 35 1. 2 Quality is Customer Satisfaction A " customer" is anyone who is impacted by the product: 1. External Customers – Include not only the end-users, but also • the intermediate processors (OEMs, distributors, retailers) • non-purchasers who have some connection to the product (government regulatory bodies) . Internal Customers – Include not only other divisions of the company that are provided with components for an assembly, but also • others that are affected (the Purchasing department that receives an engineering specification for a procurement) Quality Management Slide 7 of 35 1. 3 Two Views of Quality Internal View of Quality Compare product to specification Get product accepted at inspection Prevent plant & field defects Concentrate on manufacturing Use internal quality measures View quality as a technical issue Efforts coordinated by quality manager External View of Quality

Compare product to competition (and BIC) Provide satisfaction over product life Meet customer needs on goods & services Cover all functions User customer-based quality measures View quality as a business issue Efforts directed by upper management Quality Management Slide 8 of 35 2) What is Management? Management is the process of designing and maintaining anenvironmentin which individuals, working together in groups, accomplish efficiently selected aims. Quality Management Slide 9 of 35 2. 1

Management FunctionsGoalsof Claimants Use of Resources Reengineering the System

What , When Planning How Organizing Who Staffing Leading Controlling Produce Results Quality Management Slide 10 of 35 FacilitateCommunicationLinks 2. 1 Management Functions Strategic Tactical Quality Management Time Spent in Carrying Out Managerial Functions Slide 11 of 35 Controlling Organizing Planning Leading 3) What is Quality Management? Quality management is the process of identifying and administering the activities needed to achieve the quality objectives of an organization. Desired Quality Performance Current Quality Performance Quality Management Slide 12 of 35 3. Juran's Trilogy CHRONIC WASTE (opportunity for improvement) Joseph Moses Juran (1904-2008) • Quality Planning designing products, services and processes to meet new breakthrough goals • Quality Control meeting goals during operations • Quality Improvement creating breakthroughs to unprecedented levels of performance Slide 13 of 35 Quality Management 3. 1 Juran's Trilogy Quality Planning • Establish quality goals • Identify customers • Discover customer needs • Develop product features • Develop process features • Establish process controls, transfer to operations Quality Control Choose control subjects • Choose units of measure • Set goals • Create a sensor • Measure the actual performance • Interpret the difference • Take action on the difference Quality Improvement • Prove the need • Identify projects • Organize project teams • Diagnose the causes • Provide remedies, prove that the remedies are effective • Deal with resistance to change • Control to

hold the gains Quality Management Slide 14 of 35 4) The Need for Quality Management Two primary components of quality: • Product Features • Freedom from Deficiencies Features Deficiencies Price Share Cycle Time

Waste Warranty Income Cost Profit Quality Management Slide 15 of 35 4. 1 Drivers for Quality Changing business conditions: • Increasing competition – Customers are not willing to pay for higher quality • Changing customer – Consumer markets commands priority based on volume • Changing product mix – Low-Volume, High-Price > High-Volume, Low-Price • Increasing product complexity – More stringent requirements for reliability • Higher levels of customer expectation – Improved service quality both before and after the sale Quality Management Slide 16 of 35 4. 2 Deming Chain Reaction

William Edwards Deming (1900-1993) Quality Management Slide 17 of 35 5) Total Quality Control Armand Villan Feigenbaum (born 1922) Quality Management Slide 18 of 35 5. 1 Key Elements of Total Quality • • • • • • • • • • Strategically Based Customer Focus Obsession with Quality Scientific Approach Long-Term Commitment Teamwork Continual Improvement of SystemsEducationand Training Freedom through Control Unity of Purpose Employee Involvement and Empowerment Slide 19 of 35 Quality Management 5. 2 Scope of Quality Management Traditional (Little Q) Emerging (Big Q) Products Manufactured goods

All products, goods & services, (whether for sale or not) Processes Processes directly related to manufacture of goods All processes, manufacturing support, business, etc Industries Manufacturing All industries, manufacturing,

service, government, etc (whether profit or not) Slide 20 of 35 Quality Management 5. 3 Triple-Role Concept TripleUnder this enlarged concept (Big Q), all jobs encompass three roles for the jobholder: • customer : receives processed information and/or goods • processor : converts inputs into outputs • supplier : delivers resulting products to customers e. g.

The Product Development function • receives information on customer needs from Marketing • creates designs for new products • furnishes specifications to Operations Quality Management Slide 21 of 35 5. 3 Triple-Role Concept TripleInput I am Responsible for Quality As a Good Customer I will As a Good Process Owner I will As a Good Supplier I will Output My Supplier My Customer Requirements & Feedback • Agree on & document my requirements with my supplier • Learn & apply the tools of quality – teach others • Understand my customer requirements, agree on, & document my deliverables Requirements & Feedback Return defective inputs to my supplier promptly & tactfully • Continuously improve my process – reduce defects, cycle-time & know benchmarks • Reduce defects & variations in my output • Feed back input quality data to my supplier • Document & display my process, defect levels, & CI projects • Measure my output quality from my customer's perspective Quality Management Slide 22 of 35 3. 2. 1 SIPOC Diagram Supplier Input Process Function 1 Output Customer Internal Internal Function 2 External … External Function i … Customer What are my requirements? Function n End-User What are their expectations?

Who are my Suppliers? What are my Funtions? Who are my Customers? Exercise 1 Describe the triple-role for the following: • a process engineer •

an equipment engineer • a quality manager • an under-graduate For each scenario, identify the key responsibilities for each triple-role. Quality Management Slide 24 of 35 6) The Importance of Quality The first job we have is to turn out quality merchandise that consumers will buy and keep on buying. If we produce it efficiently and economically, we will earn a profit in which you will share. William Cooper Procter (1862-1934) Company Employees Address in 1887

Three issues critical to manufacturing and service: • Productivity • Cost • Quality Quality Management Slide 25 of 35 6) The Importance of Quality Improved Quality • Competitive Advantage • Reduced Cost Less returns, rework and/or scrap • Increased Productivity Increased Profits • Satisfied Customers Quality > Sales > Profit > Jobs Quality Management Slide 26 of 35 6. 1 Cost of Poor Quality GM announces recall April 14, 2009 06: 56 PM HUNTSVILLE, AL (WAFF) - General Motors is recalling 1. 5 million vehicles because of potential engine fires. GM says there have been no reports of any fires or injuries.

Some of the recalled vehicles are no longer in production. The recall involves vehicles with a 3. 8-liter V6 engine. The government says drops of oil could fall into the exhaust system and cause a fire in the engine. The recall includes the 1998-1999 oldsmobile Intrigue, the 1997-2003 Pontiac Grand Prix, 1997-2003 Buick Regal, and the 1998-2003 Chevrolet Lumina, Monte Carlo and Impala. A gm spokesperson says the recall is just a precautionary measure for consumers. Quality Management Slide 27 of 35 6. 1 Cost of Poor

Quality Sony recalls 438, 000 laptops on burn concern Fri, Sep 05, 2008 Reuters

NEW YORK, US - Japan's Sony Corp has launched a voluntary recall of 438, 000 Vaio portable computers, citing a potential hazard that could cause the machines to overheat or possibly burn a user. It is one of the biggest computer recalls since 2006 when Dell Inc recalled 4. 1 million notebook computer batteries because they could overheat and catch fire. Quality Management Slide 28 of 35 6. 1 Cost of Poor Quality Prima Deli chocolate cakes likely cause offoodpoisoning By Hasnita A Majid, Channel NewsAsia | Posted: 03 December 2007 2259 hrs SINGAPORE: If you've bought chocolate cakes from bakery chain Prima Deli, you should throw them away.

The advice comes from the Ministry ofHealth(MOH) and the Agri-Food and Veterinary Authority (AVA). The two agencies say these cakes are likely to contain a bacteria called Salmonella Enteriditis, which has caused some people to get food poisoning. Salmonella is a group of bacteria that can cause symptoms such as fever, watery diarrhoea, vomiting and abdominal pain. 106 people have so far reported getting food poisoning after eating the cakes. Six had to be hospitalised, but have since been discharged. They tested positive for Salmonella Enteritidis. Quality Management Slide 29 of 35 6. 1 Cost of Poor Quality

The Space Shuttle Challenger disaster occurred on January 28, 1986, when Space Shuttle Challenger broke apart 73 seconds into its flight, leading to the deaths of its seven crew members. The spacecraft disintegrated over the

Atlantic Ocean, off the coast of central Florida, United States at 11: 39 a. m. EST (16: 39 UTC). The Space Shuttle Columbia disaster occurred on February 1, 2003, when the Space Shuttle Columbia disintegrated over Texas during re-entry into the Earth's atmosphere, with the loss of all seven crew members, shortly before it was scheduled to conclude its 28th mission, STS-107. Quality Management

Slide 30 of 35 6. 2 Quality, Costs and Schedules Quality • Emphasis on Quality – Elimination of causes of error and rework Reduction in Costs Improve delivery Schedules • Emphasis on Quality – Unnecessary product features – Unrealistic tolerances – Perfectionism in inspection Increase in Costs Missing delivery Schedules Costs Schedules Will emphasis on Quality have a positive or negative impact on Costs and Schedules? Quality Management Slide 31 of 35 6. 2 Quality, Costs and Schedules Quality is about doing things right the first time and about satisfying customers. But quality is also about costs, revenues, and profits.

Quality plays a key role in keeping costs low, revenues high, and profits robust. Perry L Johnson http://www. pji. com/aboutplj. htm Quality Management Slide 32 of 35 7) The QualityOdysseyTransformational change or radical change is different from incremental change. A breakthrough can mean different things to different people. Radical Change Carry-Over Modules from Past • " As-is" • Minor modifications • 5S • Root causes are not always identified Incremental Change • Quality improvement • Lean Manufacturing • Process flow revisions • Customer focused • Re-design • Creative thinking • Innovation • Six Sigma • Benchmarking • Newtechnology

Fix as Fail Self-Inspection • Check • Inspect • Quality Control • Revise Towards " Best-in-Class" Quality Quality Management Slide 33 of 35 7) The Quality Odyssey Recognize Leaders recognize the need for change and focus on achieving " Best-InClass" Quality. Define Leaders define the strategy, goals and objectives necessary to pursue " BestIn-Class" Quality. Organize Steps are taken to measure and analyze the organization's current position. Improve Deploy strategy by selecting key problem areas, training people, establishing measures, developing solutions, and implementing improvements. Control Determine if improvements are working.

If so, establish controls to maintain this new level of Sustain Integrate improvements throughout the organization & standardize best practices. Select new areas for improvement. Alignment between customers' expectations and the organization's strategic plan, processes and activities ultimately results in the right things being done right. Quality Management Slide 34 of 35 Recommended Further Reading 1. Juran's Quality Planning and Analysis for Enterprise Quality Frank Gryna, Richard C H Chua and Joseph A DeFeo McGraw-Hill, 5th Edition, 2005 Chapter 1 : Basic Concepts Quality Management Slide 35 of 35