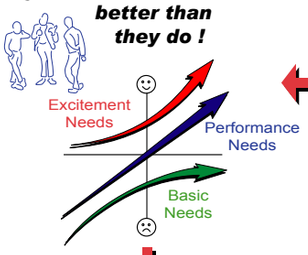
E-mail info@c2c-solutions.com for a printable electronic copy of the *latest version* of this Roadmap

"CONCEPT TO CUSTOMER"

(A Roadmap for the Integrating leading DFSS Methods)

In the late 20th century many leading companies realized that the Product Development Process was as important as the product itself. This process must involve strategic thinking, technical discipline, knowledge, creativity, innovation, and speed to ensure a successful response to your customers needs. The Concept to Customer Roadmap is a unique and strategic course-of-action that integrates leading **Design for Six Sigma (DFSS)** "tools" which accelerate product introduction and ensures a profitable life cycle. This global graphical roadmap has a **very brief explanation** of the Integration. Each step in this roadmap represents DFSS "tried and proven" techniques which may require additional in-depth explanation.

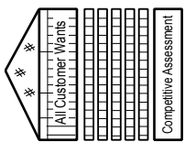
(B) (VOC) Understanding your Customers "Needs" better than they do !



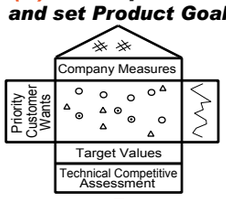
(A) Business Case and Project Plan

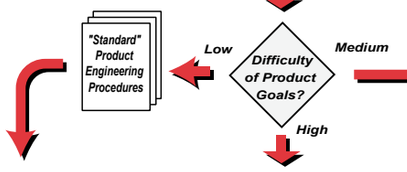
(C) Document & Prioritize the Customer "Needs"

(A useful e-QFD "Shortcut")



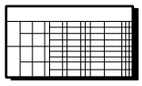
(D) Develop Metrics and set Product Goals



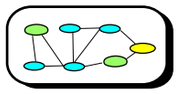


(F) Design FMEA

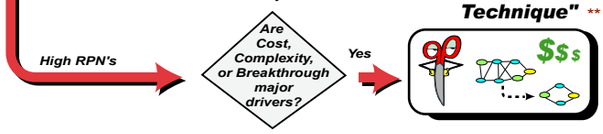
(If Design Concept is known)



(E) Product Function Analysis **



(G) The "Trimming Technique" **



"**" - TRIZ Techniques

(H) 25+ Strategies & Techniques for Innovation, Problem Solving, and Concept Generation

Design "Challenges"

"Left Brained" Strategies

1) Knowledge base of 7,500 Scientific Effects **
2) Separation Principles for Physical Conflicts **
3) Inventive Principles for Engineering Conflicts **
4) Technology Trends and Forecasting **
5) The "Ideal" System and the Use of Resources **
6) Strategic Patent Analysis
7) Semantic "Knowledge" Mining
8) Industry Trend Analysis
9) Lateral Benchmarking
10) Scope Expansion
11) Customer Modifications
12) The Trimming Technique **
13) Common Denominators
14) Feature Transfer

Ideas, Concepts, Solutions H

"Right Brained" Strategies

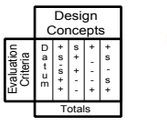
15) Blue-Sky Brainstorming
16) Have the "Right" People
17) "Painstorming"
18) Anomalous Analysis
19) Enliven the 6 Senses
20) Super Lateral Benchmarking
21) Using Nature
22) DeBono's 6 Hats
23) Sales Point Scrutiny
24) Time Savings Activities
25) Can't Fix it?, Feature it!
26) Getting "Lucky"
27) And more . . .

Design Concepts

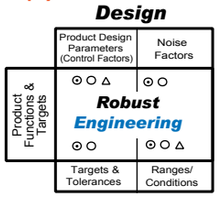
Process Concepts

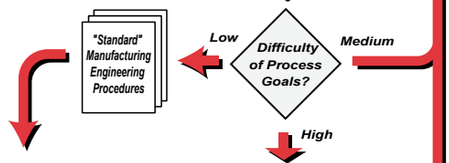
Manufacturing "Challenges"

(I) Design Concept Evaluation and Selection



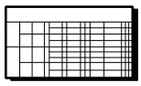
(J) Robust Product Design



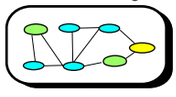


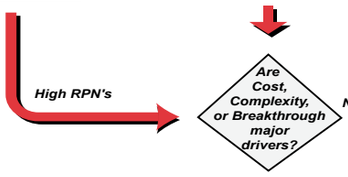
(F) Process FMEA

(If Process Concept is known)

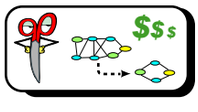


(K) Process Function Analysis **

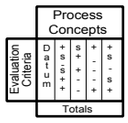




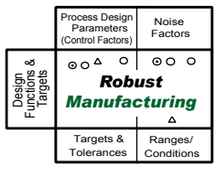
(G) The "Trimming Technique" **



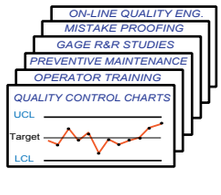
(I) Process Concept Evaluation and Selection



(L) Robust Process Design



(M) Production Control



Delivery to Customer

(With Quality, Cost, and Time Objectives Achieved)

(N) Kaizen !

A. Business Case / Project Plan - *Here the team explains why it is important to work on this "Project". The team develops a plan which includes the Issues, identification of Customers, Market, Scope, Goals, Constraints, Strategy, Team Membership, etc.*

B. Understanding and Anticipating Customer's Needs - *This step is the cornerstone for every project. The "Enhanced" Kano Model is a powerful model that illustrates three critical types of needs that must be understood and delivered to the customer: **1) Basic Needs** - Are expected needs, yet unspoken by the customers. **2) Performance Needs** - Are the spoken and consciously evaluated needs customers talk about. **3) Excitement Needs** - Are the Innovations, "WOWs", & neat surprises. Over 35 strategies exist to "uncover" these 3 types of needs.*

C. Document & Prioritize the Customer's "Needs" - *A well documented and prioritized list of requirements helps keep them current and visible. This (e-QFD "shortcut") uses specific criteria to help decide how each requirement will be "deployed". This also keeps a "House of Quality" from turning into a "Mansion of Quality"!!*

D. Developing Metrics & Product Goals - *It's very hard to improve things that can't be measured. The QFD "House of Quality" is an excellent product development tool that helps to develop metrics and specific goals for the customer's "fuzzy" requirements.*

E. Product Function Analysis - *"A problem well described is a problem 80% solved." Functions are the most important aspect of any engineering system. Here, we describe in terms of functions, our engineering system, it's problems, and perform a comprehensive "Value" Analysis.*

F. Design & Process FMEA's - *An FMEA (Failure Modes & Effects Analysis) is a proactive systematic approach used by Product & Process Engineers to help assure your product and processes perform their intended functions over their entire life span. A tabular method is applied to analyze potential failure modes, their effects, and develop an action plan to ensure your customers never see these failures.*

G. The "Trimming Technique" - *When cost reduction, complexity reduction, or a true breakthrough is needed in the design, this technique uses cost and complexity reduction strategies and algorithms for simplified product or process scenarios. (VA/VE "Tool")*

H. 25+ Strategies for Innovation - *Difficult problems need breakthrough thinking. Most people think only "special" people have the ability to Innovate. NOT TRUE!! Several Psychological and Technological strategies for "Systematic Innovation" can be leveraged by "normal" people to accelerate innovative thinking and quickly develop unique ideas.*

I. Concept Selection - *Pugh's Concept Selection is one of a handful of objective methods that assists in evaluating and synthesizing concept alternatives.*

J. Robust Product Design - *This step can integrate Dr. Taguchi's philosophy of "Robustness" with a QFD phase to detail the critical Design Characteristics with "optimized" target values to achieve a "Robust Design".*

K. Process Function Analysis - *"A problem well described is a problem 80% solved." In Process development, functions are the most important aspect of the manufacturing process. Here, we describe in terms of functions, our manufacturing process, its problems, and perform an operational "Value" Analysis.*

L. Robust Process Design - *This step integrates Dr. Taguchi's philosophy of "Robustness" with QFD to detail the critical Process Parameters and "optimized" target values to achieve a "Robust Process".*

M. Production Control - *These are the "shop floor" activities that are needed in order to maintain capable processes and approach a Six Sigma operation. These activities help to prevent reverting back to the "old way".*

N. Kaizen - *A method that encourages gradual, structured, and continuous improvement for internal and external "customers" through the elimination of waste. Everyone in an organization works together on making small continuous improvements without large capital investments.*

D. Verduyn - 6/23/00 - This roadmap gets "enhanced & updated" regularly. What you are reading may be an "out-of-date" version - Visit our web-site for the latest downloadable version. **Revision Date: 01/05/02**