

Define Requirements

Gather Requirements
Identify Stakeholders and Elicit requirements

Systemic Textual Analysis
Capture expressed Stakeholder Requirements and analyse to deduce missing requirements

Viewpoint Analysis
Determine system functionality (Y = f) and structure

Needs Means Analysis
Assess potential meta-solutions to stakeholder needs

Functional Modelling
Develop a functional model of the system $Y = f(x)$ to identify logical interfaces and Functional dependencies

Analyse Requirements

Quality Function Deployment 1
Correlate and cross check requirements for completeness and consistency

Sensitivity & Failure Analysis
Assess the functional sensitivity and potential functional failure modes to identify potential emergent functionality and risk

Manage Requirements

Generate acceptance criteria

Acceptance Test Spec

Create Solution Concept

N² Analysis
Assess degree of natural functional binding and coupling to identify natural Architecture

Function Means Analysis
Identify means of achieving functionality

Architecture Modelling
Determine and model system physical architecture

Function Means Analysis
Determination of whole concept solutions

Pugh/Decision Matrix
Evaluate whole concepts against CTQs for further down-selection

Quality Function Deployment 2
Requirements-concept solution Verification and determine sub-system requirements

Optimise Solution Concept

Qualitative Robustness and Critical Parameter Analysis
Based on an existing or "in current" development product, for each phase, identify the critical design parameters and noise variables using P-diagrams, What Why Tables and DFMEA

Quantitative Robustness Analysis
Use models or physical designed experiments to characterise the transfer function and thereby robustness of the product design. Use DFMEA to determine and prioritise failure modes

Parameter & Tolerance Design to find robust optimum
Use qualitative models to explore solution space to find robust optimum and thereby determine design parameter settings and tolerances

Quality Function Deployment 3
Check that System Solution is realizable and determine critical realization parameters

Verify Solution Concept

DFMEA
Determine failure modes & mechanisms

Fault Tree Analysis
Determine design reliability

Supportability Assessment
Assess supportability through predicted reliability and operational analysis

Reliability Model
Determine design reliability

Develop Realization System
Determine how the System Solution is going to be realized

Update QFD 2
Update QFD 2 chart with robust optimum design parameter settings

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Sub-System Requirements

Test Specifications