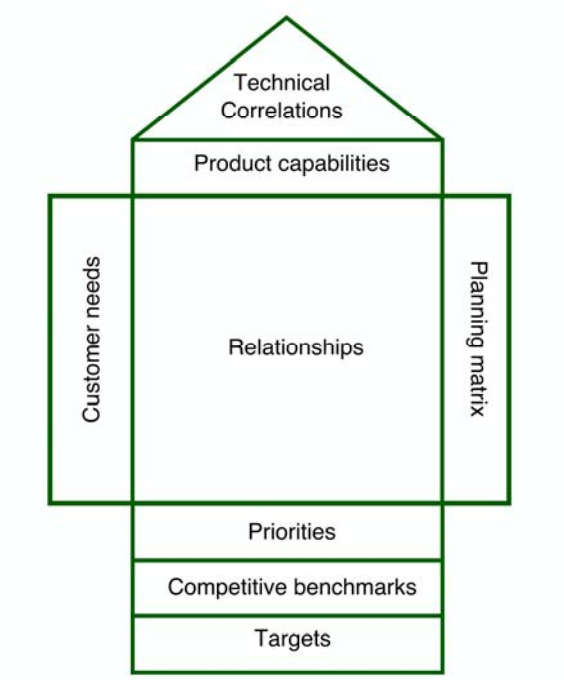
QFD and Software Projects

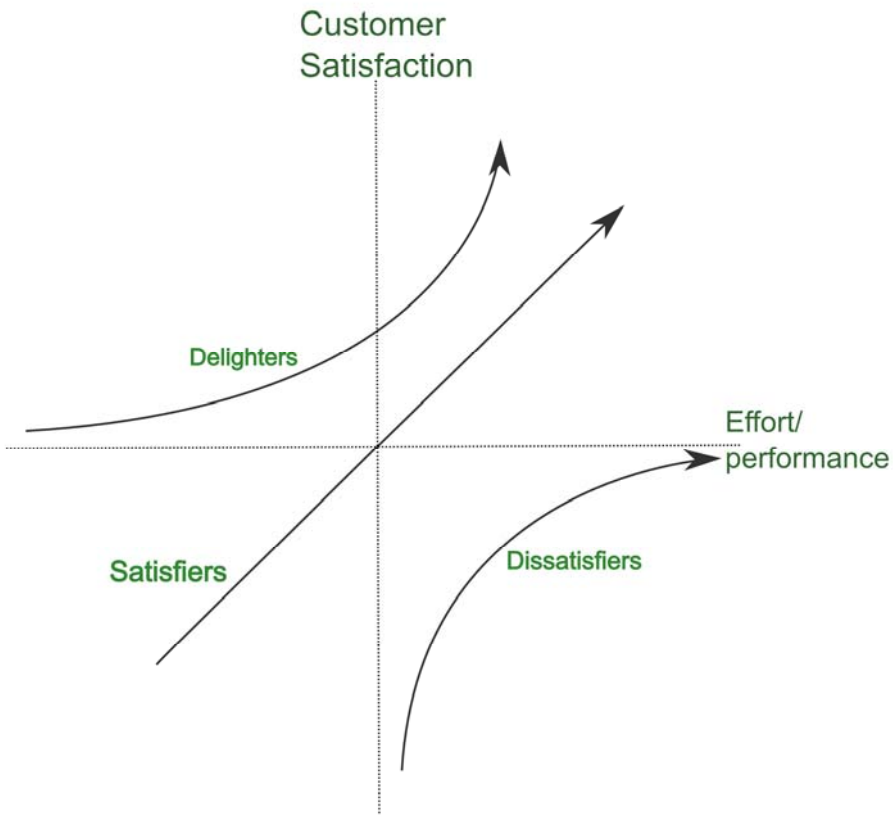
A quick tour



Outline

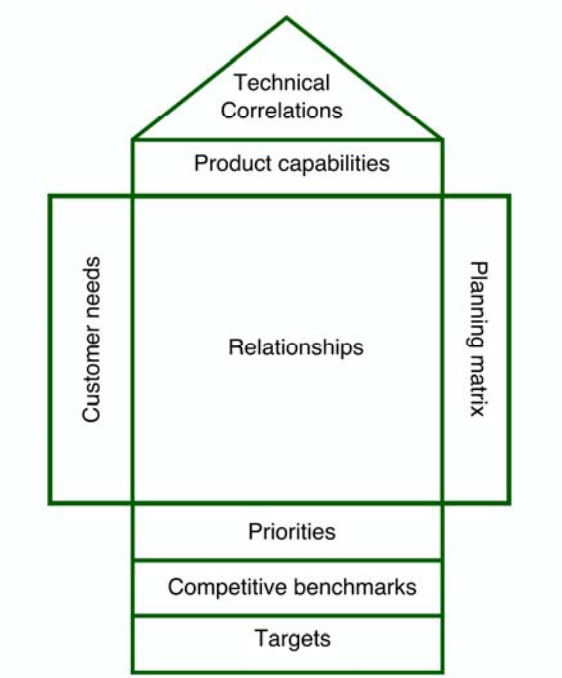
- Brief history of QFD
- Overview of tools used in QFD
- Tour of the “House of Quality”

Impact of QA on Customer Satisfaction -Why QFD?



Kano's Diagram

Brief History of QFD



Brief history of QFD

- Logical outgrowth of the Japanese quality movement of the 60's and 70's
- Success stories from Mazda, Toyota Auto Body, Fuji Xerox, Computer Services Kaisha led to interest in U.S.
- Introduced into the U.S. in early 80's by Don Clausing (Xerox) and Bob King (GOAL/QPC)

Brief History of QFD - continued

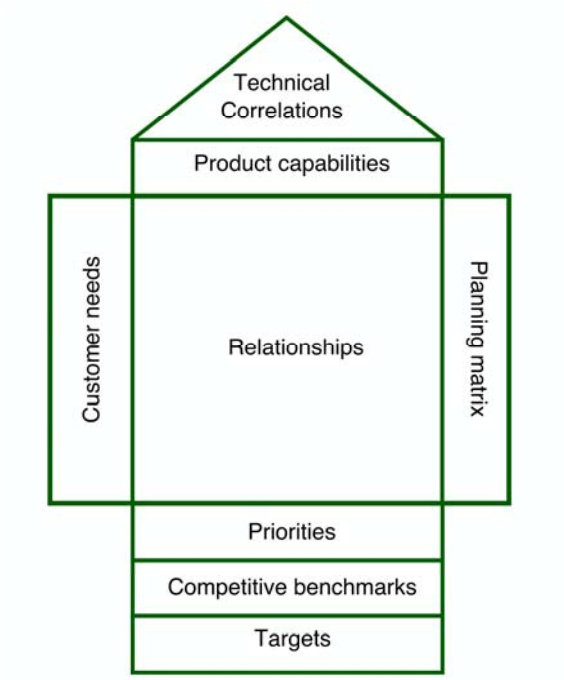
- GOAL/QPC translated core materials from the Japanese and conducted early training
- Japanese QFD process was very complex, relying on a deep knowledge of Japanese Quality Practice not widely understood in U.S.
- Early practitioners modified QFD for quick adoption in U.S.
- QFD Institute created, focus on Japanese approach
- QFD software: “QFD Capture,” “Snapsheets XL”, others

Brief History of QFD - SW

OS enhancements
Transaction Processing
CASE
Embedded disk and
controller SW

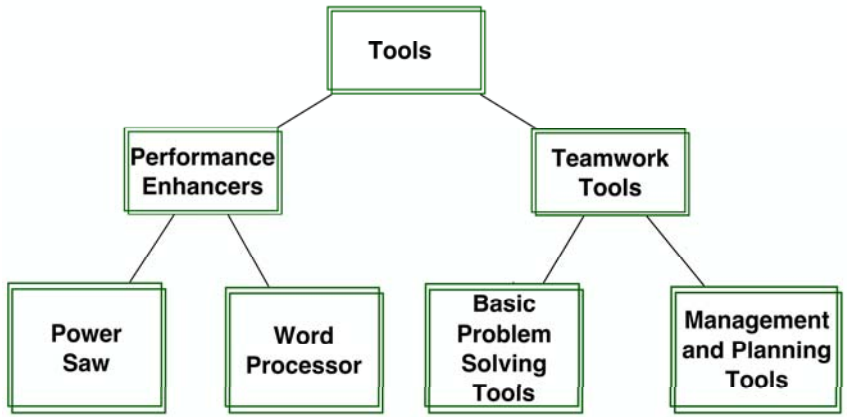
"All-In-1"
Telephone menu system
RDb Expert
VAX Clusters
Strategic planning

Overview of Tools Used in QFD



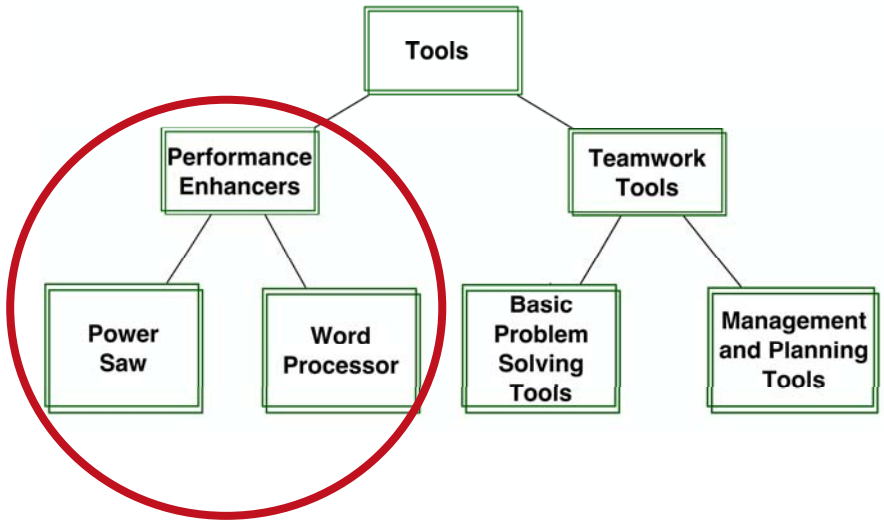
Overview of tools used in QFD

- Performance enhancers
  - Do the work faster, better
- Teamwork Tools
  - Determine the right work to be done



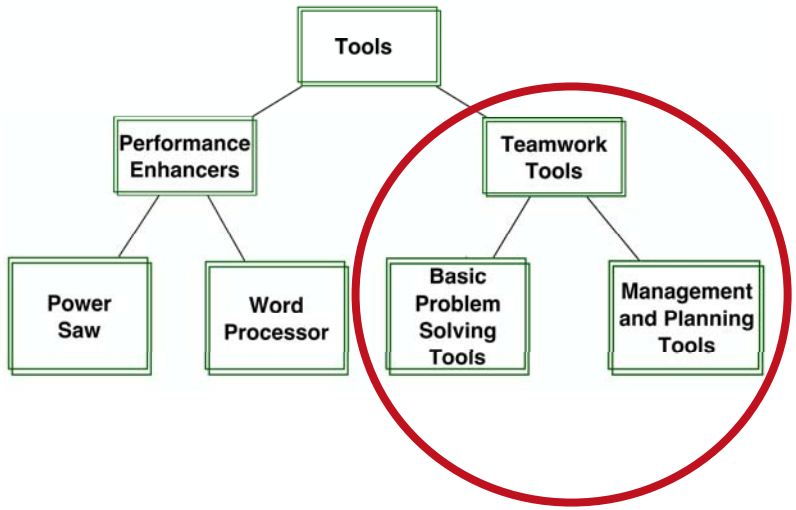
Performance enhancers - do the work right

- Power saw
- Calculator
- Spreadsheet program
- Word Processor



Teamwork Tools - do the right work

- Understand complex relationships
- Provide basis for team-based analysis and problem solving

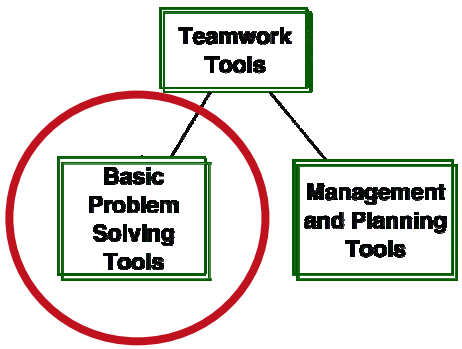


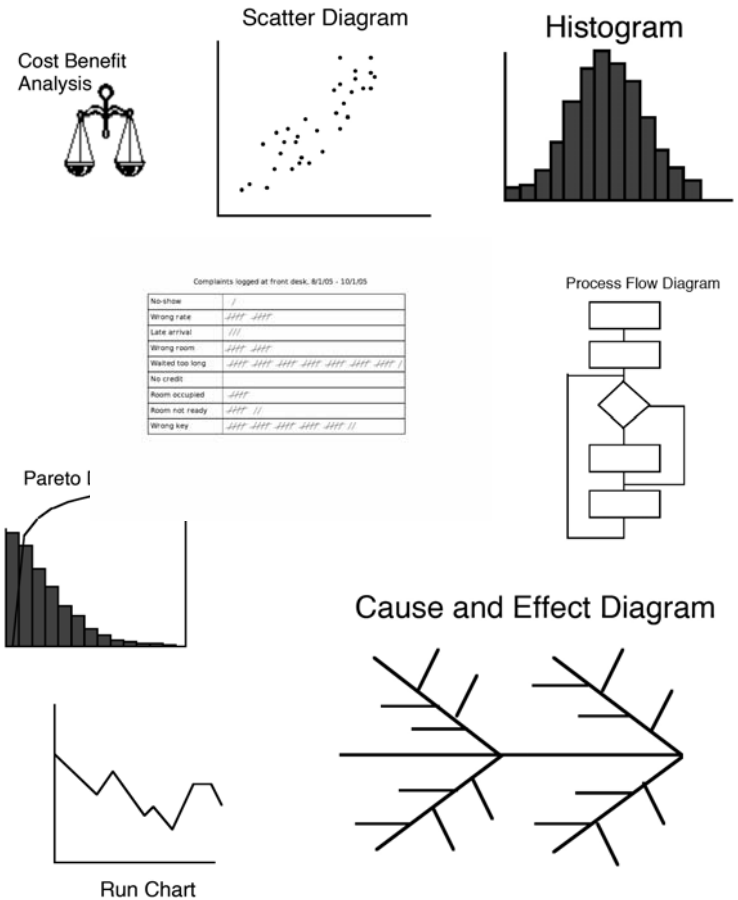
Characteristics of Teamwork Tools

- Attractive to engineers
- Encourage group visioning
- Provide answers that are "good enough"
- Easy to teach, easy to learn

SW Basic Problem Solving Tools

- For analysis of existing processes
- Data-driven
- Aimed at developing and communicating common understanding



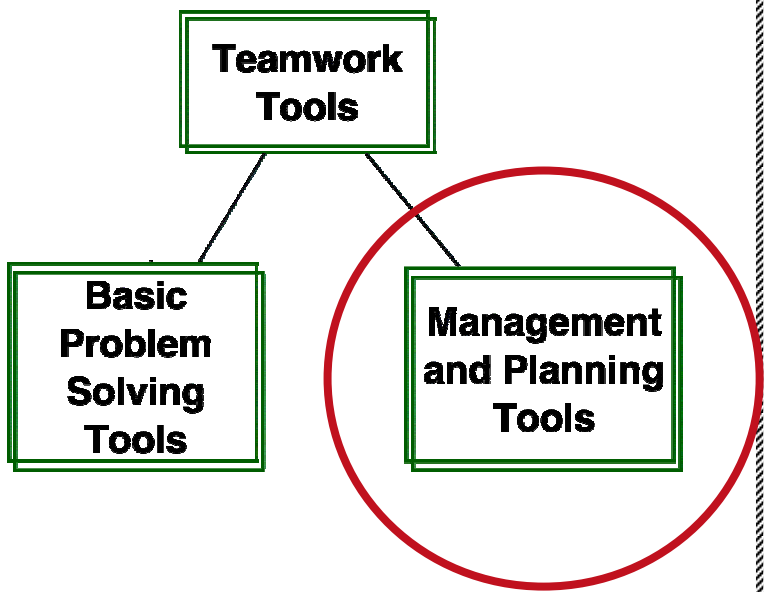


Software Management and Planning Tools

For understanding intangibles, especially from a planning point of view

– idea structuring

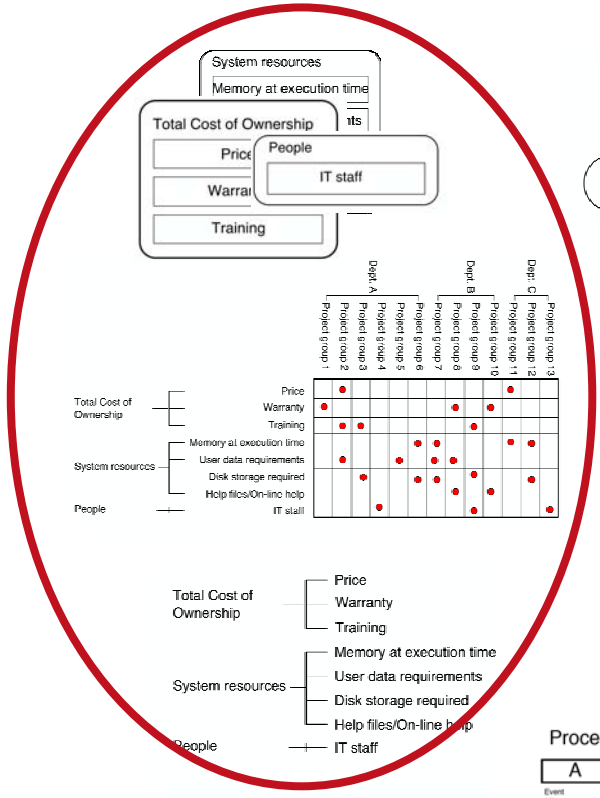
– interrelationships mapping

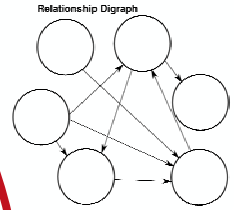


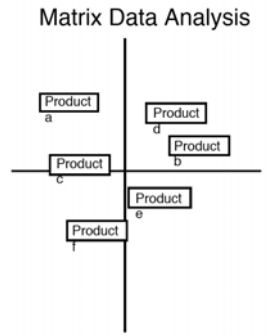
SW Management & Planning Tools

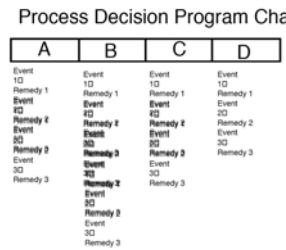
Help teams manage intangible concepts, including:

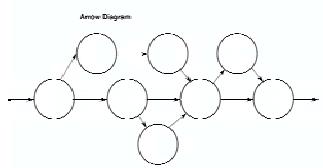
- Desires
- Preferences
- Risk
- Relationships
- Goals
- Priorities





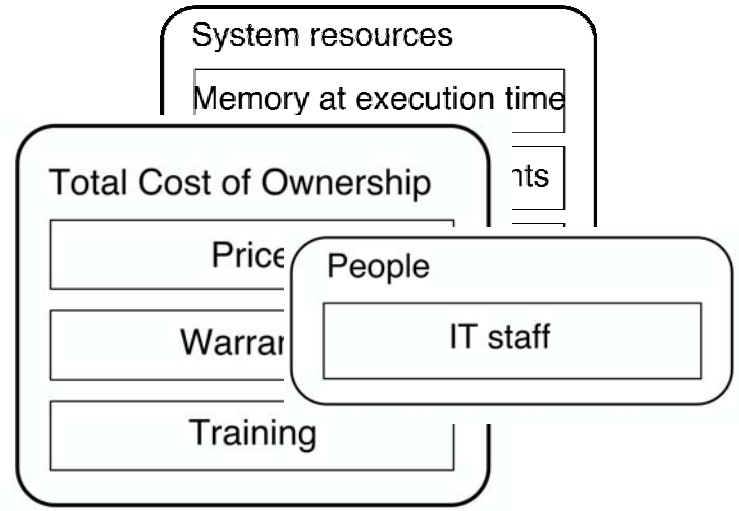






Affinity Diagram

1. Collect ideas on a focused topic of interest, by:
   - interviews, surveys, brainstorming
2. Transcribe each idea to a separate card
3. Organize the cards into general categories
4. In QFD, this is the "Voice of the Customer"

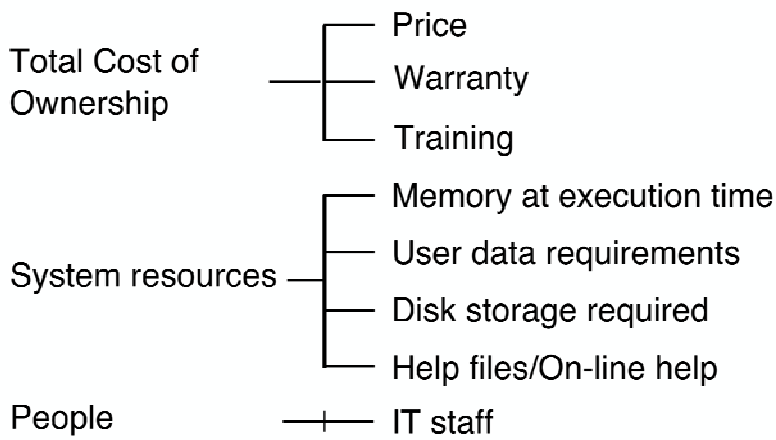


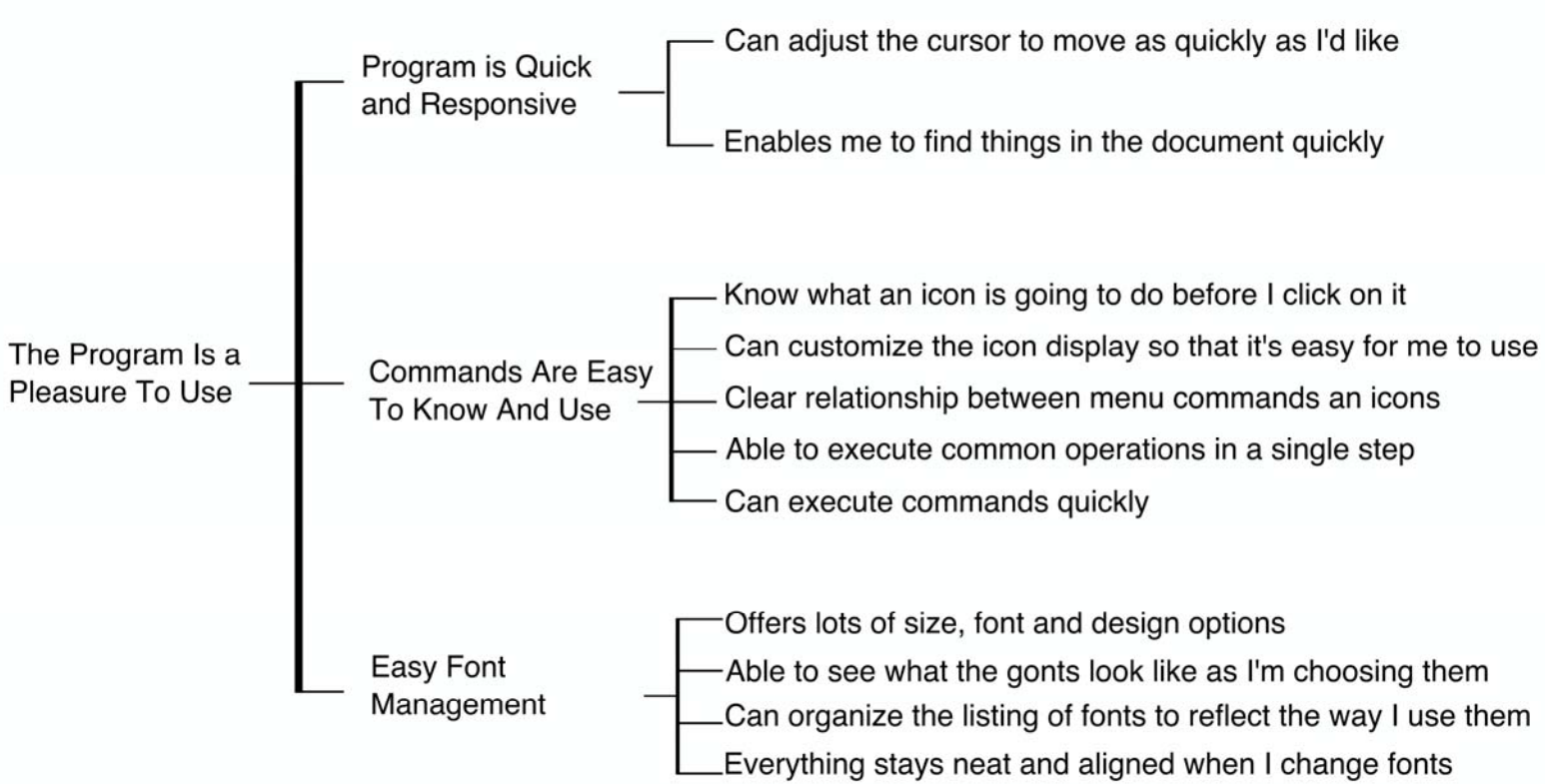
Commands are easy to know and use

- Know what an icon is going to do before I click on it
- I can customize the icon display to make it easy for me to use
- Clear relationship between menu commands and icons
- I can execute common operations in a single step
- I can execute commands quickly

Tree Diagram

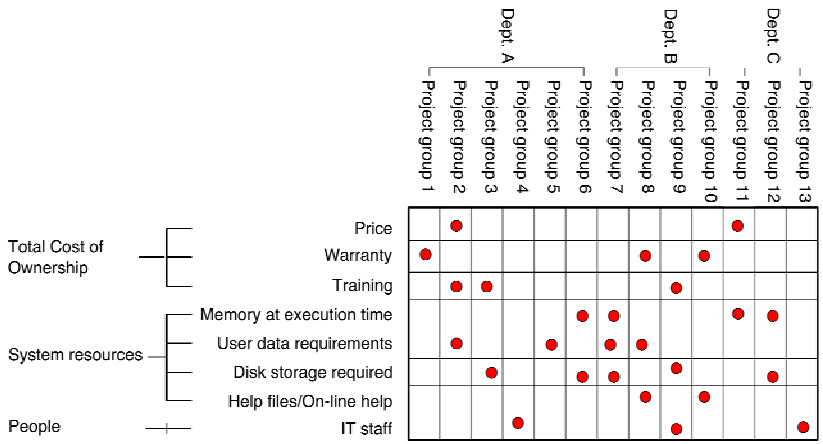
- Extend affinity diagram
- Look for holes at all levels



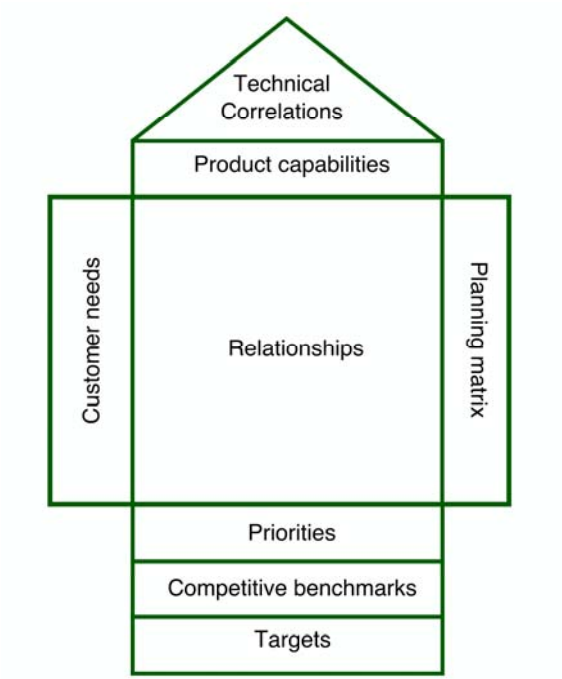


Matrix Diagram

- Map items in one dimension against items in another
- Look for correlations
- Look for lack of correlation

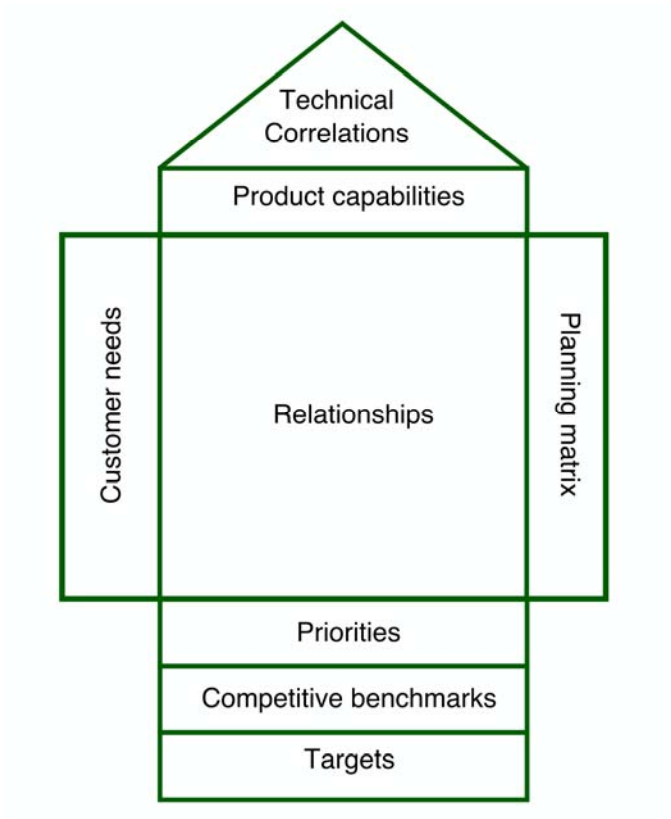


Tour of the House of Quality



THE HOUSE OF QUALITY

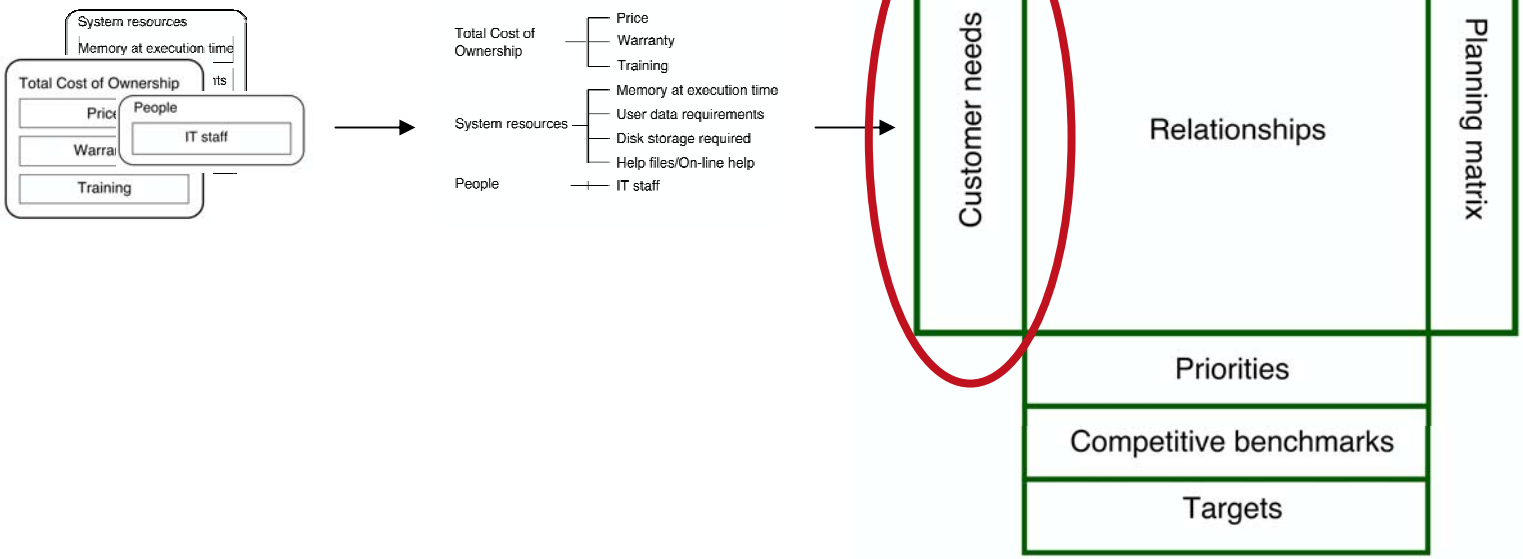
- INPUTS:
  - Knowledge of customer's needs
  - Knowledge of product's current performance (from customer's viewpoint)
  - Technical knowledge of product
- OUTPUTS:
  - Prioritization of product metrics and features, to enhance the quality and competitiveness of the product.



Customer needs

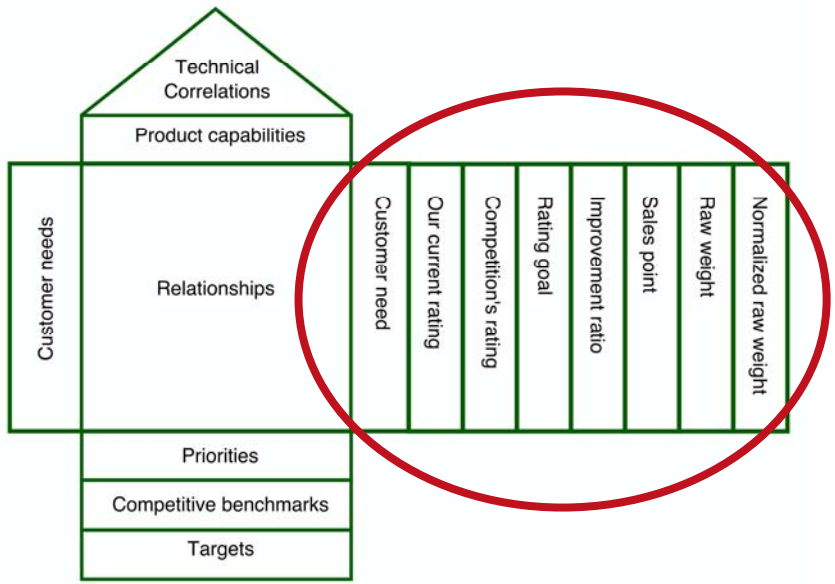
- Gather the customer's words
  - Interviews
  - Contextual inquiry
  - Survey
- Extract key phrases, transcribe to cards
- Structure them (use affinity diagram)

The House of Quality



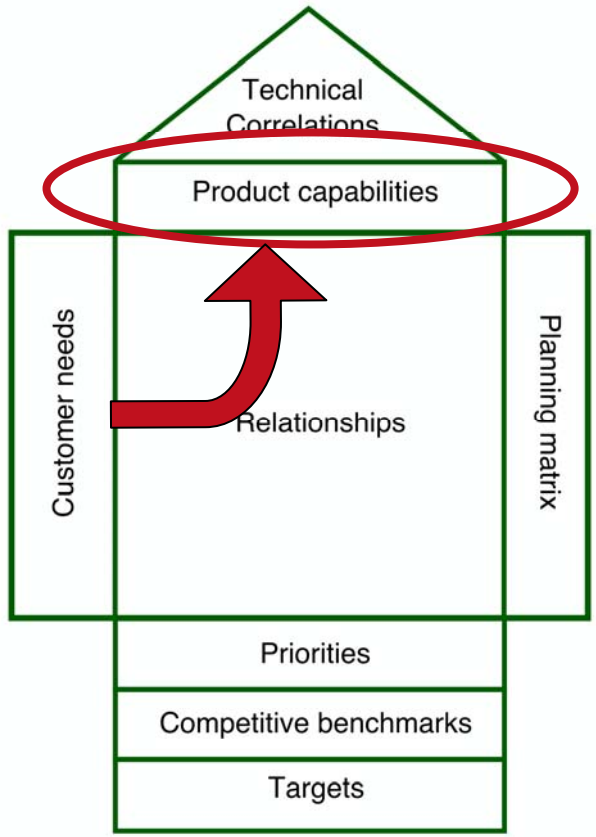
Planning Matrix

- Records strategic product planning
- How important is each need to the customer? (1-5)
- How well are doing in meeting each need? (1-5)
- How well is the competition doing in meeting each need? (1-5)
- What shall our goal be for each need? (1-5)
- If we meet the need, would we have a sales point? (1, 1.2, 1.5)
- Multiply and normalize ("Raw Weight" (R))



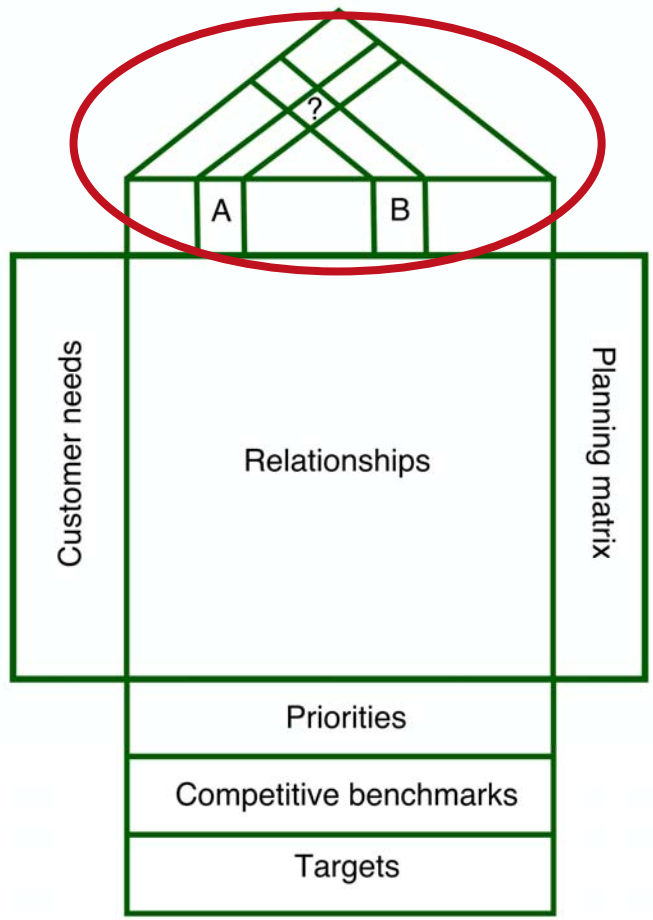
Product Capabilities

- Deploy each need to one or more product capabilities
- Merge in capabilities from other sources
- Organize with an affinity diagram and tree diagram if necessary



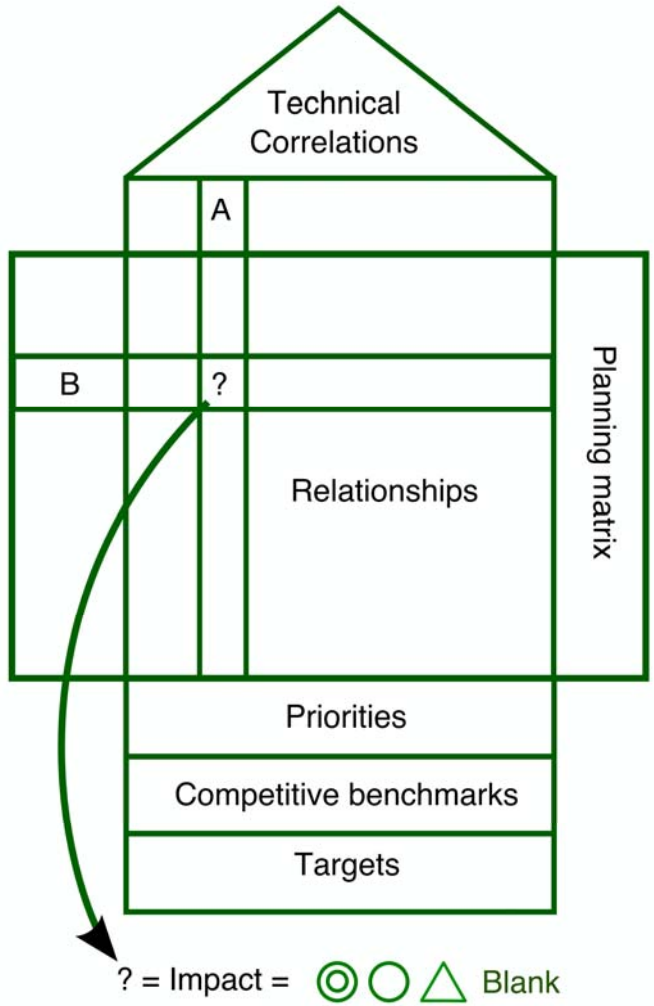
Technical Correlations

- Map the product capabilities against each other
- Will more of capability "A" enhance capability "B"?
- Will more of capability "A" detract from capability "B"?

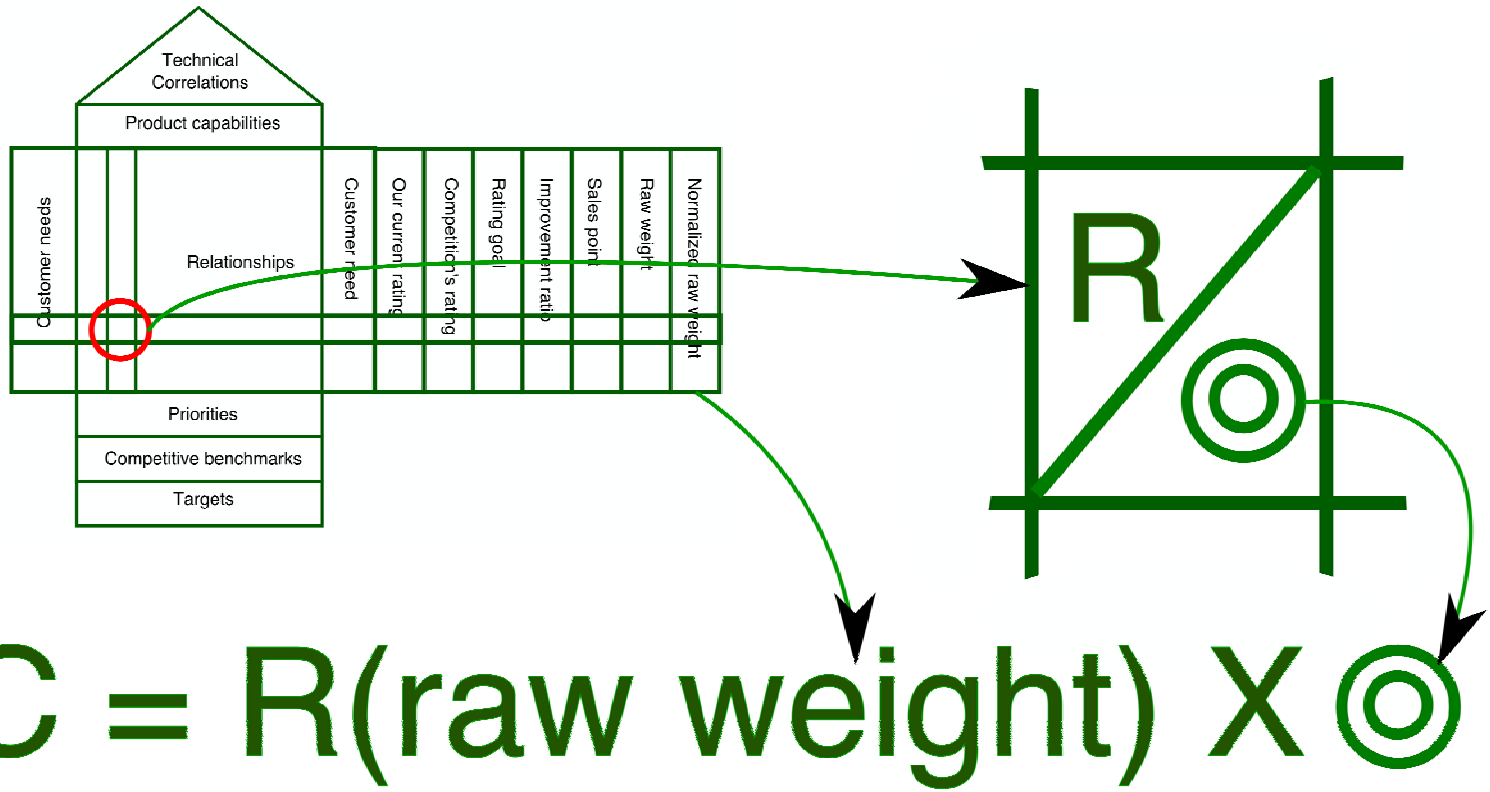


Impact

- If we do the best possible job delivering Capability "A", what Impact will it have on meeting Customer Need "B" (9,3,1,0)?

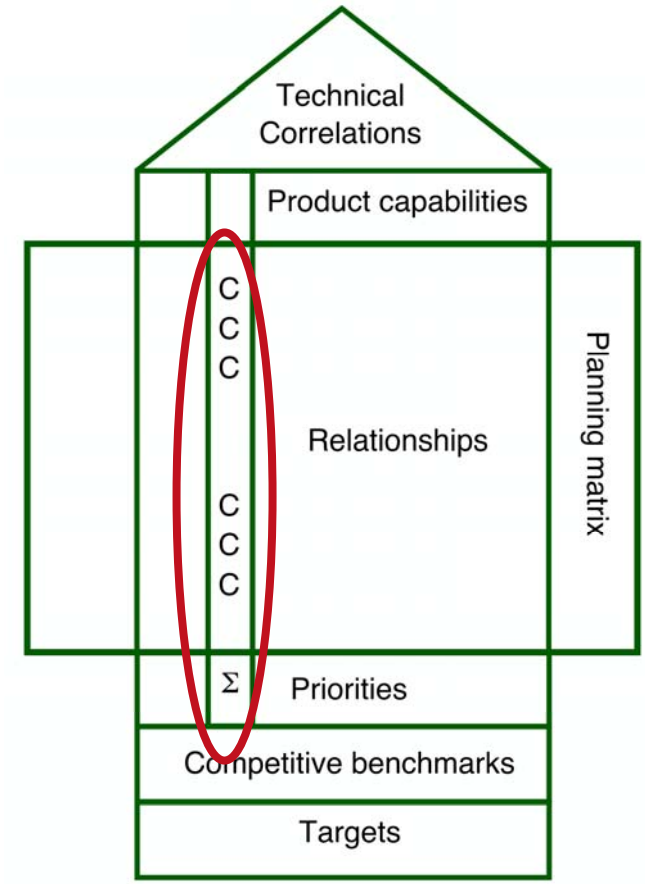


Contribution Calculation



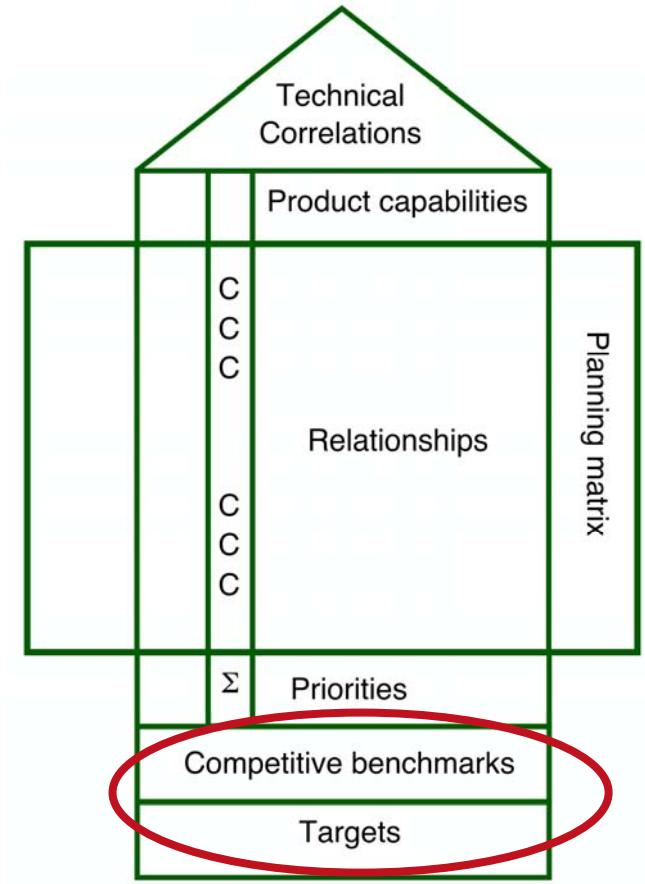
Contribution Total

- Contribution Total = Priority =Σ(Contributions) = Σ C



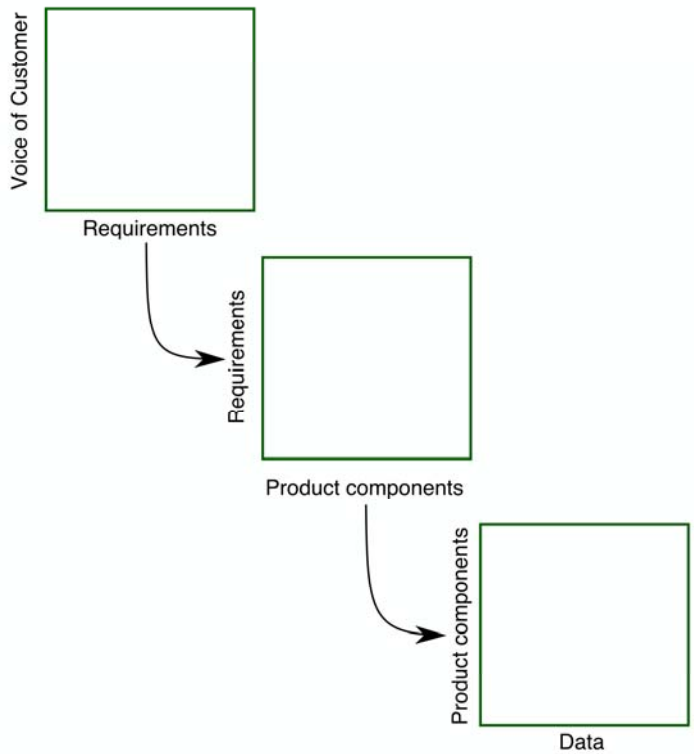
Targets

- For most important product capabilities, measure the competition
- Determine a measurement target for the important product capabilities
  - More is better?
  - Target is best?
  - Less is better?



Beyond the House of Quality

- QFD can be extended beyond the HOQ to further levels of development.



SUMMARY

- Quality planning has been generally aimed at defect reduction instead of customer satisfaction.
- QFD provides a structured method that uses customer's needs to drive technical decisions.
- QFD is attractive to most engineers and managers, although many people balk at the needed investment in time and discipline. Hence shortcuts are needed.
- If QFD provided no other benefits, its effects on team building and common visioning generally justify its use.