King Fahd University of Petroleum & Minerals

Department of Construction Engineering & Management

Chapter 12
Translating Expectations to Specifications

*CEM 515: Project Quality Management*
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FOCUS

This chapter discusses the tools and techniques for defining the quality issue. The tools and techniques define the quality issue by determining customer's needs and expectations, the critical processes,

and performance outcomes.

Introduction

❖ **Total customer satisfaction** is the primary quality issue.

❖ Customers are the only people who can determine total customer satisfaction.

❖ To achieve total customer satisfaction, the organization must know the **customer**, **itself**, its **product**, and its **competition**.

Total customer satisfaction
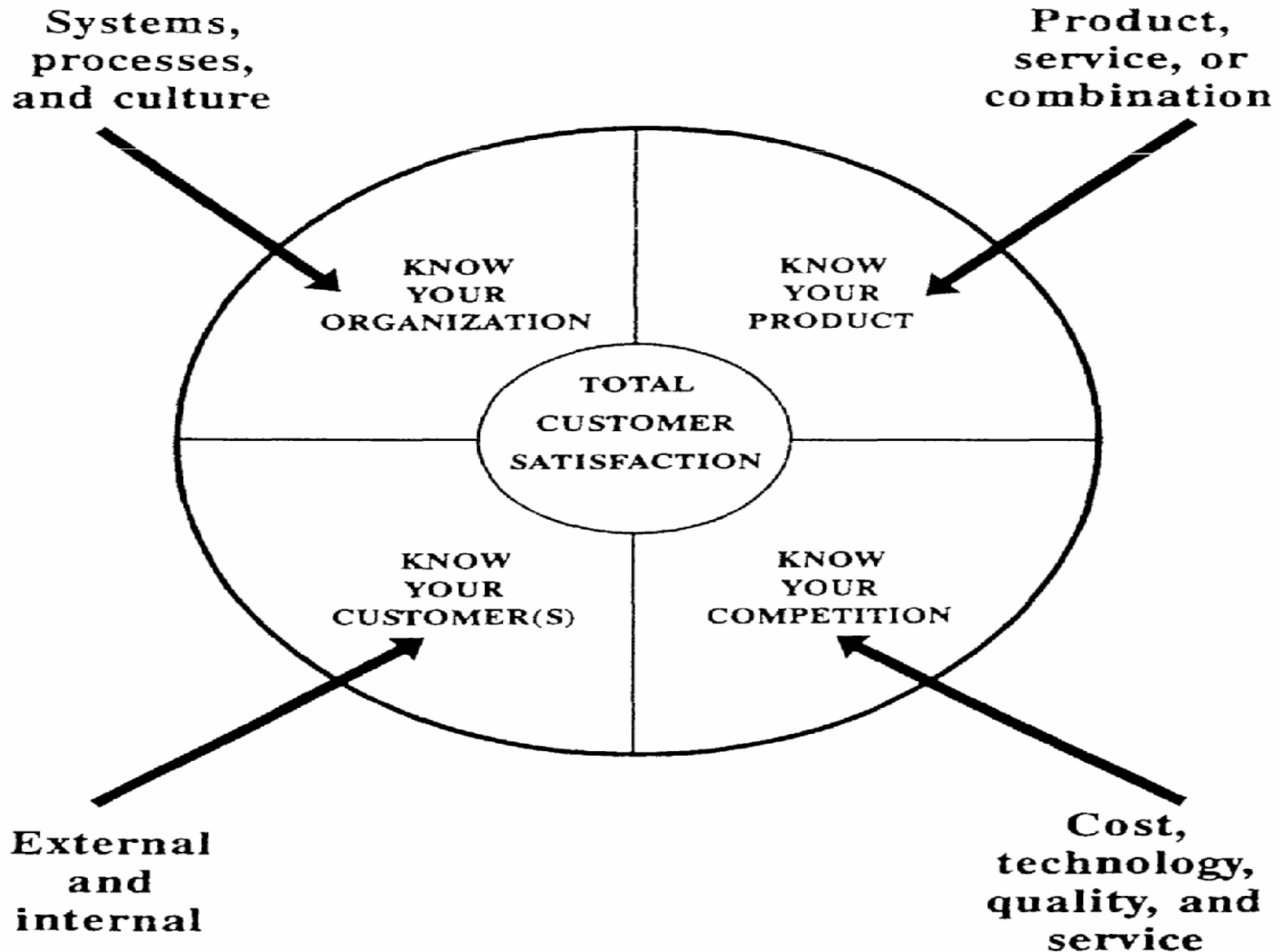
Know your customers

- ❑ Know all internal and external customers.
- ❑ Customers are the leaders in customer-driven project management.
- ❑ In order to be successful, the customer-driven project team must listen to all customers.

Identify customer needs & expectations

- Systematic, thorough, and continuous communication.

- listen to the customer.

- These needs must be monitored continuously to ensure that the product and/or service *still satisfies the customer.*

Develop customer relationships

♣ Customer relationships are the core of CDPM.

♣ This relationship ensures continuous customer satisfaction.

♣ Customer relationships require communication, support, and responsiveness.

♣ Trust is absolutely essential for any relationship

Know yourself

► Important element in achieving TCS (total customer satisfaction)

► The organization looks inward to its culture, systems, and processes.

Know your product

- Know all there is to know about your product to achieve TCS.

- The product is an output of a process that is provided to a customer (internal / external) and includes goods, services, and information.

- The goods or services may be the best in the marketplace, but it is the entire product that contributes to TCS.

Know the competition

- *Know the competition to establish targets for its products and services and internal improvement efforts.*

- *Know your competitive edges.*

- *The organization should benchmark itself against its top competitor and the best in the field.*

customer
satisfaction

normal
requirements

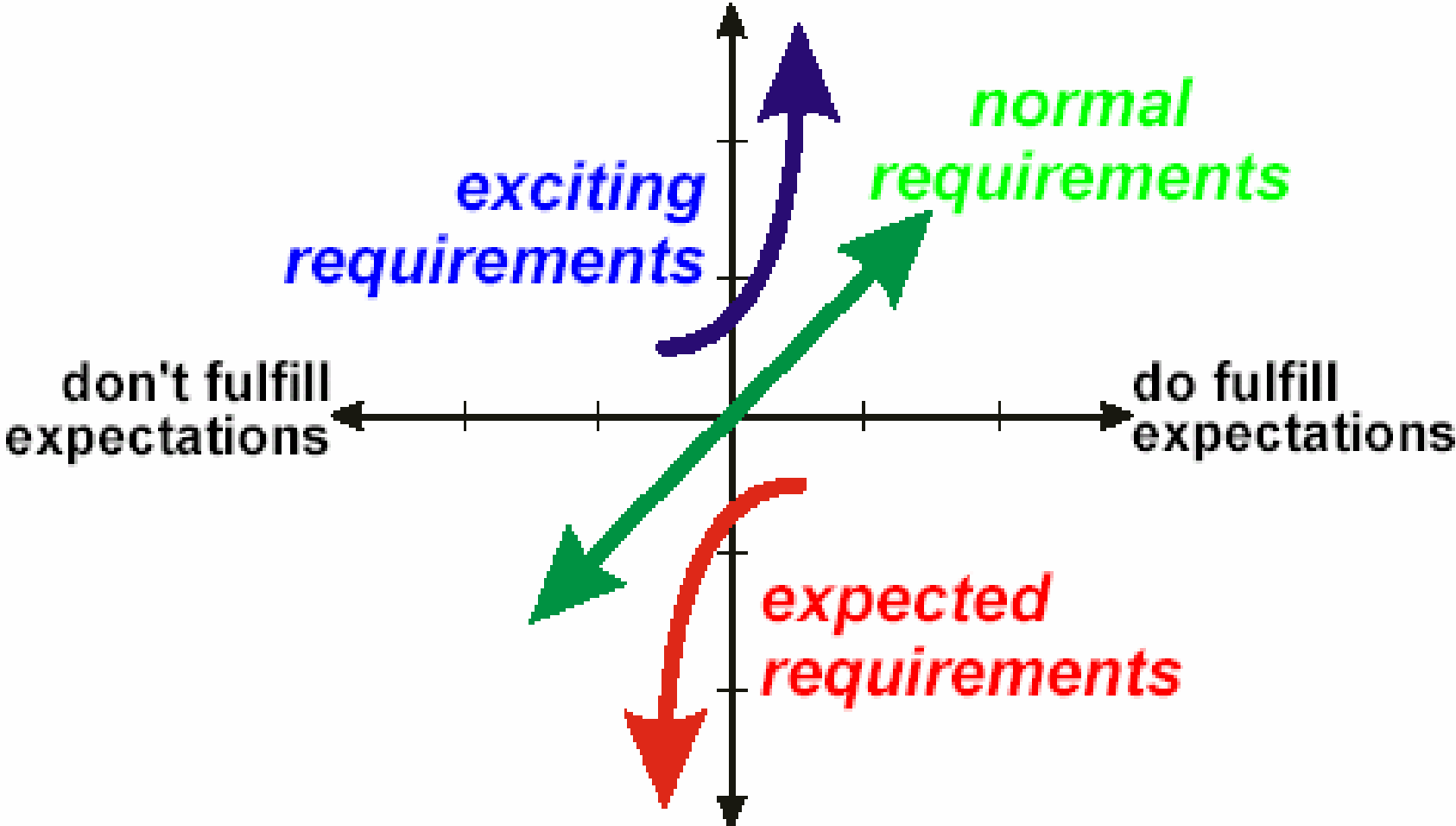exciting
requirements

don't fulfill
expectations

do fulfill
expectations

expected
requirements

customer
dissatisfaction

Customers' Requirements

- **Normal Requirements** are typically what we get by just asking customers what they want.

- **Expected Requirements** are often so basic the customer may fail to mention them - until we fail to perform them. For example, if coffee is served hot, customers barely notice it. If it's cold or too hot, dissatisfaction occurs. Expected requirements must be fulfilled.

- **Exciting Requirements** are difficult to discover. They are beyond the customer's expectations. For example, if full meals were served on a flight from Dammam to Riyadh, that would be exciting. If not, customers would hardly complain.
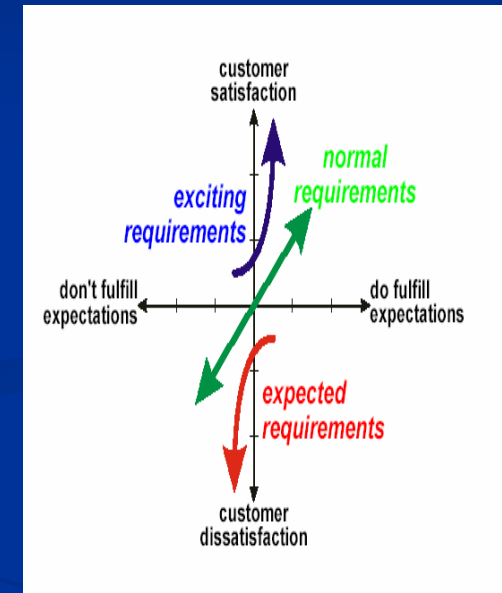
The Overall Goal

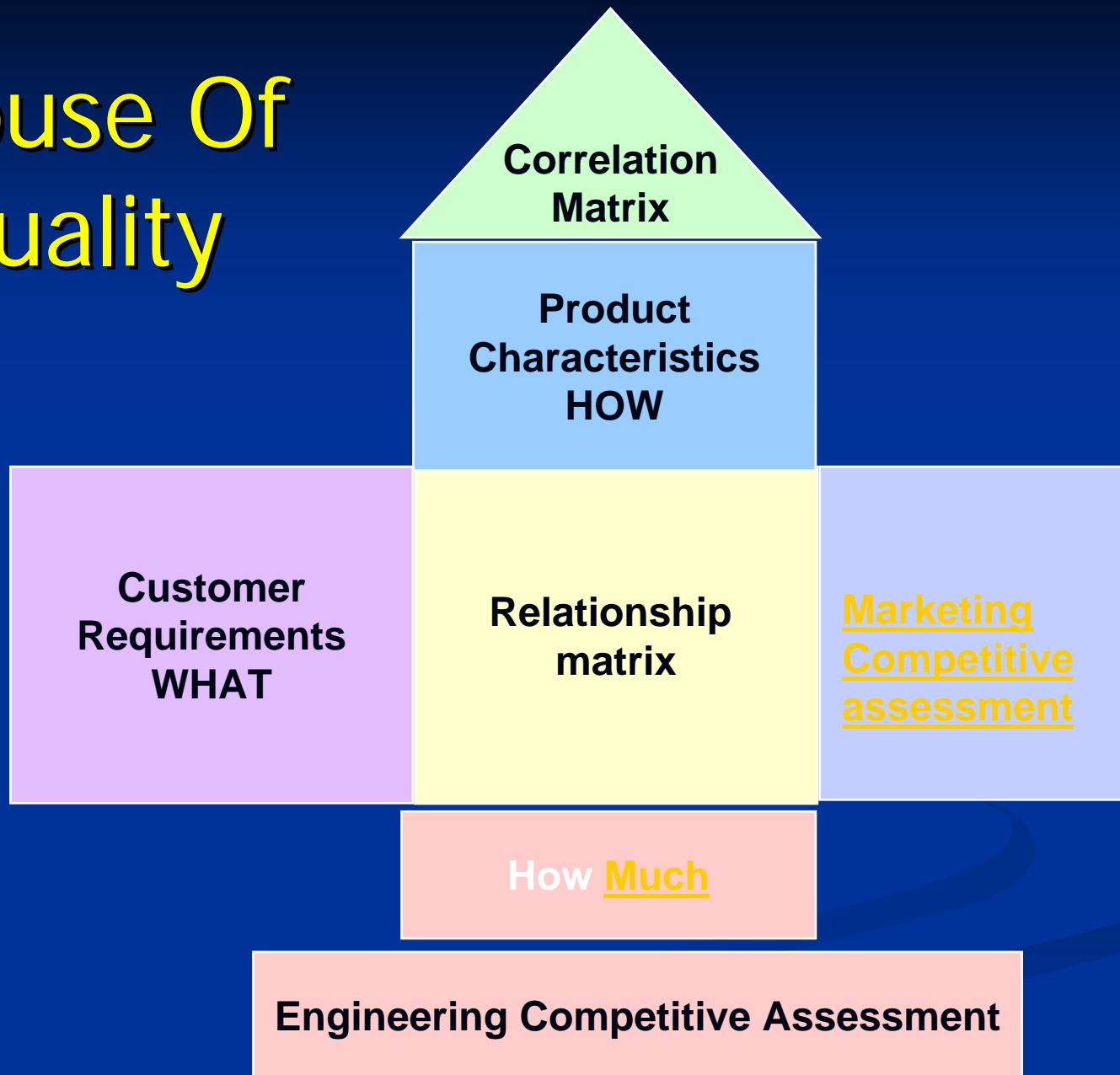- Increase customer satisfaction

$$=$$

- Increase business success

QUALITY FUNCTION DEPLOYMENT

- **Quality Function Deployment**
 - → **Voice of the customer**
  - → **House of quality**

QFD: An approach that integrates the "voice of the customer" into the product and service development process.

The "**What**" *room*

- implies the voice of the customer, located at the left portion of the matrix.

- It answers the question, "What requirements should be satisfied, or are there any special features which the customer would be delighted to discover?"
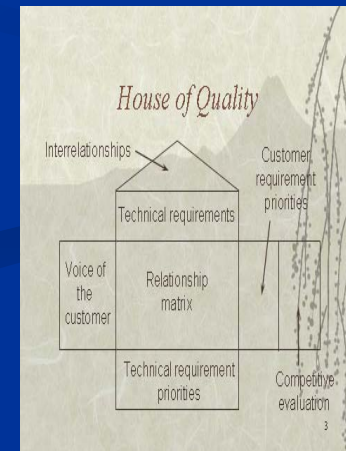

House of Quality
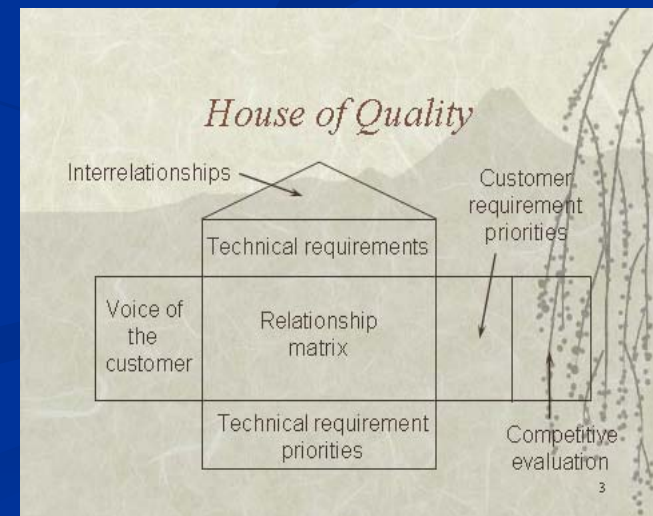
The "How" room

- Voice of the Engineers or Designers ("hows").
- Each "whats" item must be converted (refined) to "how(s)"
- They have to be actionable (quantifiable or measurable)
- located under the "*Correlation Matrix*" roof. It answers the question, "How can these customer requirements be met in terms of design requirements?"

House of Quality
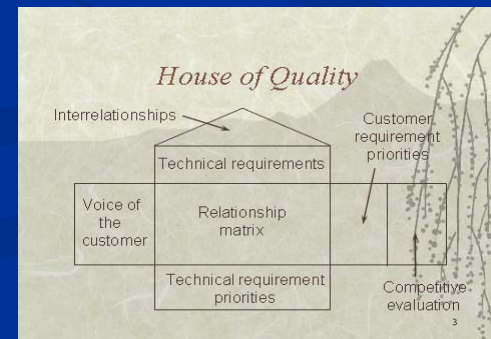
the "Relationship Matrix."

- It is the linkage between the engineering design requirements and voice of the customer.
- Correlates how "hows" satisfy "whats"
- Use symbolic notation for depicting weak, medium, and strong relationships
- Generally,
  - A circle within a circle indicates a strong correlation between the two.
  - A single circle shows a moderate correlation
  - A triangle represents a weak correlation.

House of Quality

Interrelationships

Customer requirement priorities

Technical requirements

Voice of the customer

Relationship matrix

Technical requirement priorities

Competitive evaluation

3

The "How Much" *room*

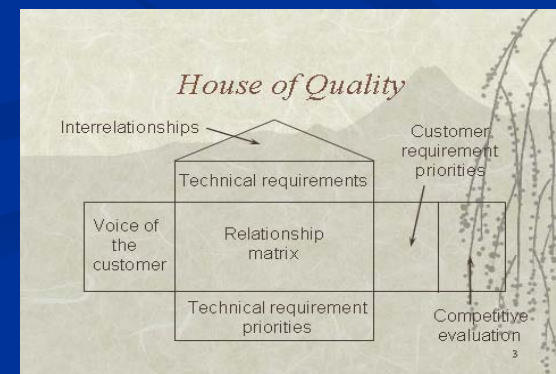- "How much's" of the "Hows" (measurement)
- Answers a common design question: "How much is good enough (to satisfy the customer)?"
- located in the box beneath the relationship matrix.
- Clearly stated in a measurable way as to how customer requirements are met
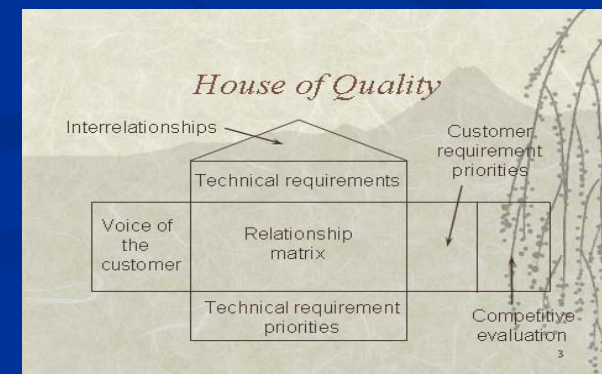- Provides designers with specific technical guidance

House of Quality
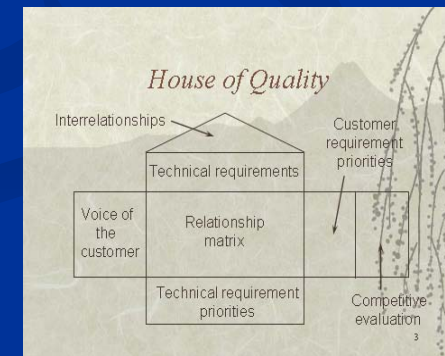
The "Correlation Matrix" *roof*

- Identifies how "hows" items support (positive) or conflict (negative) with one another
- Find trade-offs for negative items by adjusting "how much" values.
- Trade-offs must be resolved or customer requirements won't be fully satisfied.
- There are two consequences of a negative correlation.
  - The first consequence is to redesign the product in order to eliminate the tradeoffs.
  - The second consequence is to determine an optimization target in which the design tradeoffs are included with their relative importance to the customer considered.
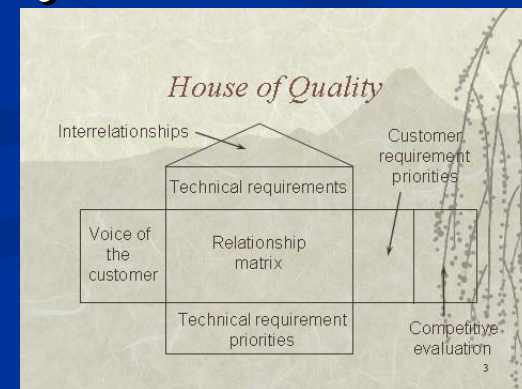

House of Quality

Interrelationships

Customer requirement priorities

Technical requirements

Voice of the customer

Relationship matrix

Technical requirement priorities

Competitive evaluation

3

The "Engineering Competitive Assessment" *room*

- collects the data in engineering terms and records it on the chart. Each item is scaled separately as it relates to its relative merit for each test from good to poor. The "*Engineering Competitive Assessment*" room is recorded below the "*How Much*" room and corresponds to the "*How*" room column. An importance rating is assigned to each test on a certain scale.

House of Quality

Interrelationships

Technical requirements

Customer requirement priorities

Voice of the customer

Relationship matrix

Technical requirement priorities

Competitive evaluation

3

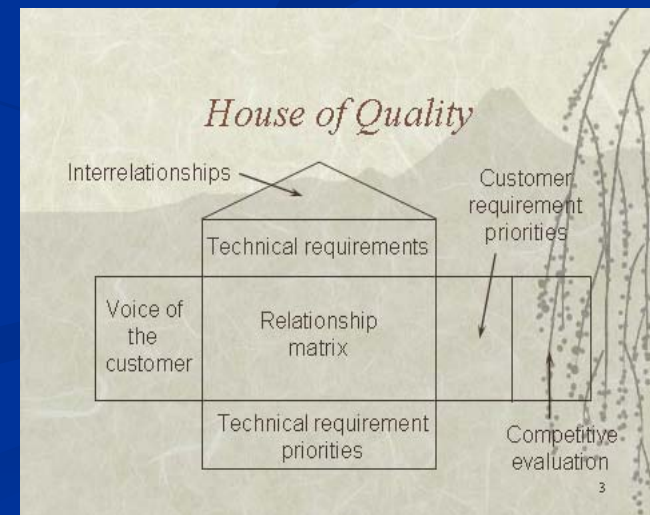# *The* "**Marketing Competitive Assessment**" *room*

- Also called the "*Customer Competitive Assessment*" room. Its location is next to the "*Relationship Matrix*" room.

- This competitive benchmarking helps identify the current best-in-class designs as well as the strengths and weaknesses of each design. A weighted scale is also applied to the system.

House of Quality

Interrelationships

Technical requirements

Customer requirement priorities

Voice of the customer

Relationship matrix

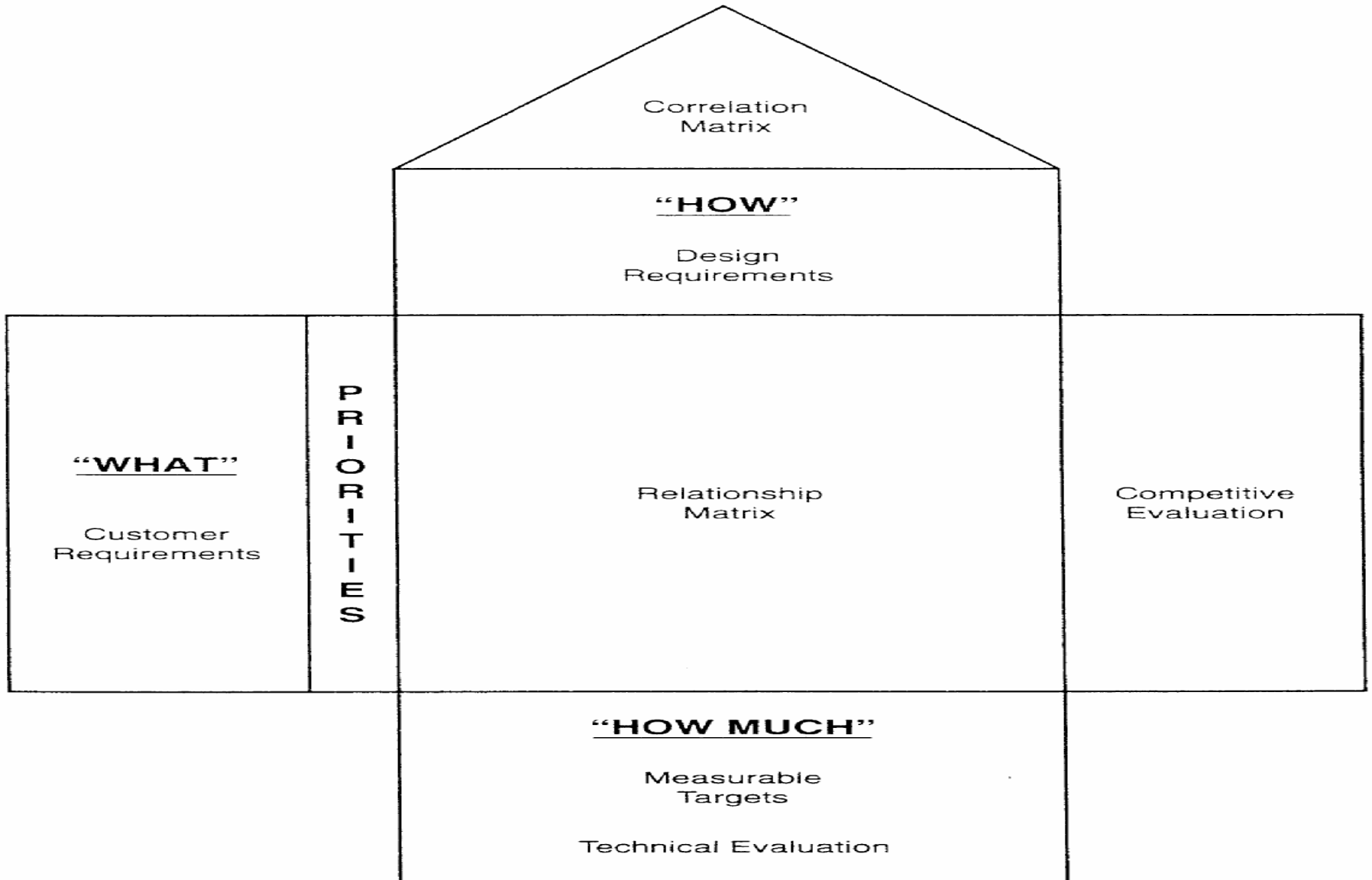Technical requirement priorities

Competitive evaluation

3

Quality Function Deployment

QFD involves four phases:

1. Product planning,
2. Parts deployment,
3. Process planning, and
4. Production planning.

House of Quality

Interrelationships — Technical requirements

Customer requirement priorities

Voice of the customer

Relationship matrix

Technical requirement priorities

Competitive evaluation

QFD "house of quality"

QFD "house of quality" steps for phase 1

1. Determine the "whats".
2. Transform the "whats" to "hows".
3. Determine the nature of the relationships between the "whats" and the "hows"
4. Establish how much data are needed.
5. Correlate each "how" to each other "how."
6. Complete the customer and technical competitive evaluation sections.
7. Assign or calculate importance ratings.
8. Analyze results.

Relationship
- ☆ Strong Positive
- ★ Positive
- ○ Negative
- ● Strong Negative
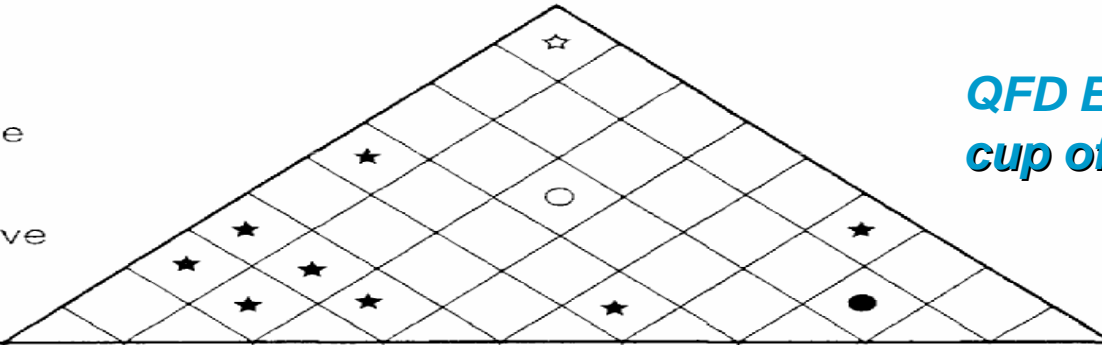
Customer Reqts.	Importance	Serving Temperature	Amount of Caffeine	Flavor Component	Flavor Intensity	Aroma Component	Aroma Intensity	Sale Price	Volume	Temperature After Serving	Customer Competitive Evaluation (Bad → Good)
Hot	5	■								□	△
Eye-Opener	2	□	□								□ △
Rich Flavor	3	△	△	■	□			□			△ □
Good Aroma	3					■	□				□ △
Low Price	1							■	□		△ □
Generous Amount	4							□	■		△ □
Stays Hot	5	□								■	□ △
Tech. Difficulty		1	3	4	4	4	4	1	1	5	
Objective Target Values		130° F	___ppm	Established by Judges	Established by Judges	Established by Judges	Established by Judges	$0.40	12 Fl. Oz.	>110° f At 2 Min.	
Importance Rating Abs.		69	9	27	6	27	6	21	39	45	
Importance Rating Rel.		5	1	3	1	3	1	2	4	5	

Excellent Cup of Coffee

Product Reqts.

Technical Competitive Evaluation (Good / Bad)

- △ Weak
- □ Medium
- ■ Strong

Benchmarking

♠ *Benchmarking is a method of measuring your organization against the recognized best performers in a certain industry, organization, function, system, or process.*

♠ *The purpose of benchmarking is to provide a target for improving the performance of your organization.*

Benchmarking contd..

- ✓ Brings the focus on improvement efforts.
- ✓ Emphasizes desired outcomes.
- ✓ Nurtures competitiveness.
- ✓ Creates the desire to be the best.
- ✓ Holds the organization together.
- ✓ Measures critical areas.
- ✓ Analyzes critical areas against the best.
- ✓ Reinforces continuous improvement.
- ✓ Keeps everyone on target.

Benchmarking contd..

▶ The steps to be taken during benchmarking are:

- ➢ Understand your organization.
- ➢ Select critical areas for benchmarking.
- ➢ Determine where to get benchmark information.
- ➢ Collect and analyze data.
- ➢ Select target benchmarks.
- ➢ Determine your performance.
- ➢ Set desired outcomes.
- ➢ Use improvement methodology to achieve desired performance.

Metrics

➢ Metrics are meaningful measures that target CPI actions.

➢ Metrics are a measure made over time, which communicates vital information about the quality of a process, activity, or resource.

Metrics contd..

♦ Metrics considerations include:

- Meaningful to the customer.

- Establish appropriate actions.

- Tell how well the process is performing.

- Repeatable over a period of time.

- Indicate a trend.

- Clear operational definitions.

- Simple to collect.

Metrics contd..

- Steps in the development of metrics:
  - Define the purpose of the metric.
  - Develop an operational definition.
  - Determine if measurements are available.
  - Generate new measurements if required.
  - Evaluate the validity of the metric.
  - Institute and baseline the metric.
  - Measure the process against baseline.
  - Prepare metric presentation.
  - Use the metric for continuous improvement
    action.

END OF CHAPTER