Basics of Quality Management

Lecture 3

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BASICS OF QUALITY MANAGEMENT

REPEAT MIDTERM: 2019.12.17. 10:00

CONSULTATION TIME: WEDNESDAY, 13:00-13:30

Quality

Tenner, DeToro:

„Quality is a **business strategy** …”

QUALITY = COMPLIANCE WITH CUSTOMER NEEDS.

TQM philosophy

- Flexible
- ’Quality culture’
- Snowball principle
- Combination
  - **Quality culture** (focus on improving the quality)
  - **Quality strategy**(sustainable quality improvement)
  - **Process improvment tools** (tools to support the program)
  - **Continuous process improvement** (empowered to improve his/her individual processes)

Goal

TQM

Principles

- Customer focus
- Process improvement
- Total involvement

Supporting elements

- Leadership
- Supportive structure
- Communication
- Education and training
- Reward and recognitions
- Measurement

Total Quality Management

- **Customer focus:**

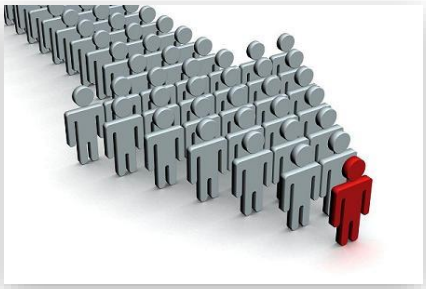
  Mapping, analysing customer needs, meeting needs and expectation at all times

- **Process improvement:**

  continuous development of all steps in the process to reduce disparities and improve reliability

- **Total involvement:**

  utilizing the knowledge of employees, active participation, broad delegation



Total Quality Management

Supporting elements I.

- **Leadership:**

  personal exemplary, teacher, "leader"

- **Education and training:**

  provides the information that employees need in connection with the organization's mission, vision, direction, and strategy.

- **Supportive structure:**

  executive support, external experts,

  expert circle

Total Quality Management

Supporting elements II.

- **Communication:**

  quality communication, choice of appropriate communication channel and message

- **Reward and recognitions:**

  rewarding successful individuals and groups

- **Measurement:**

  using the data, measuring the satisfaction of external buyers, enable objective performance assessment

Total Quality Management

1. Customer focus

- Identify the customer

– Who is the customer exactly?

- Understanding the customers' requirements – What they want?
- Mechanisms for understanding customers

Aim:
constantly meet customer expectations and provide value

Total Quality Management

1. Customer focus

- **Who is the customer?**
  - External customer
  - Internal customer

Internal customer concept: 90% x 90% x 90% = 73%

Quality as an advantage

"Just to have the customer satisfied is not enough…You have to do better than that."

"Satisfying customers merely keeps you in the game."

Competitive advantage – Delighting customers

Internal Customers VS External Customers

The case of HE?

Total Quality Management

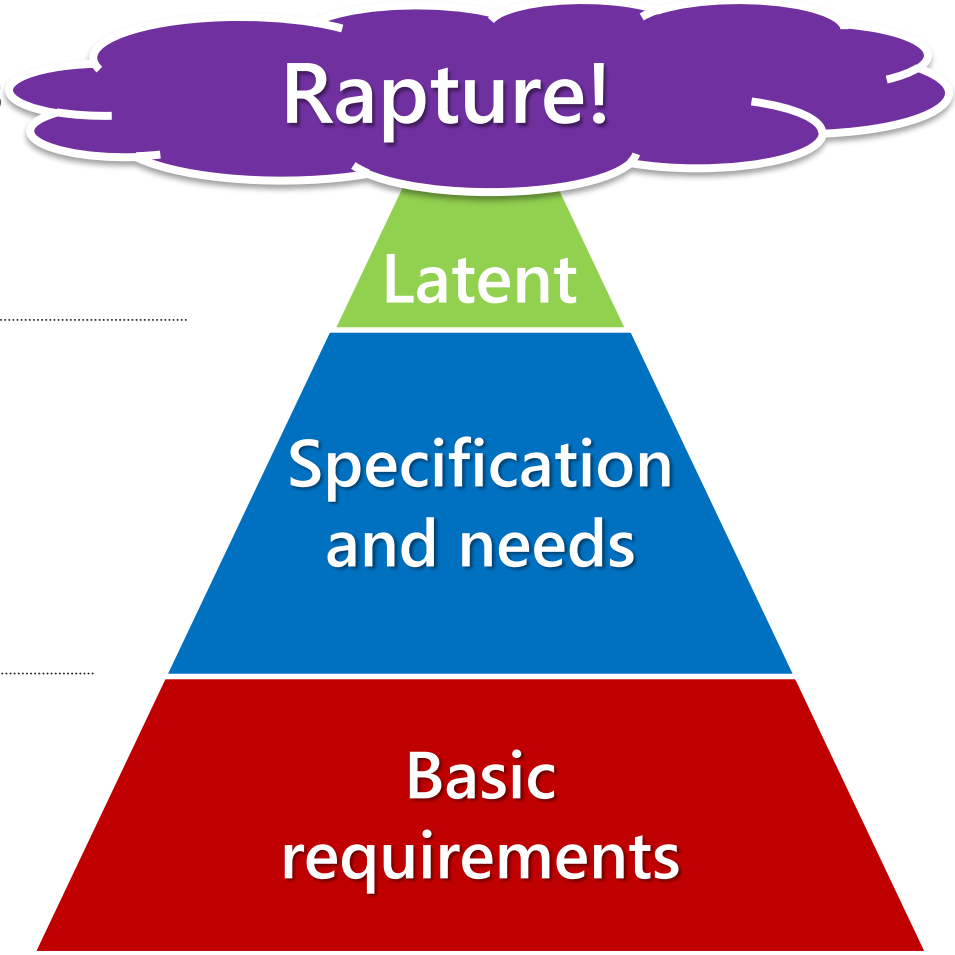
1. Customer focus

Understanding the customers' requirements

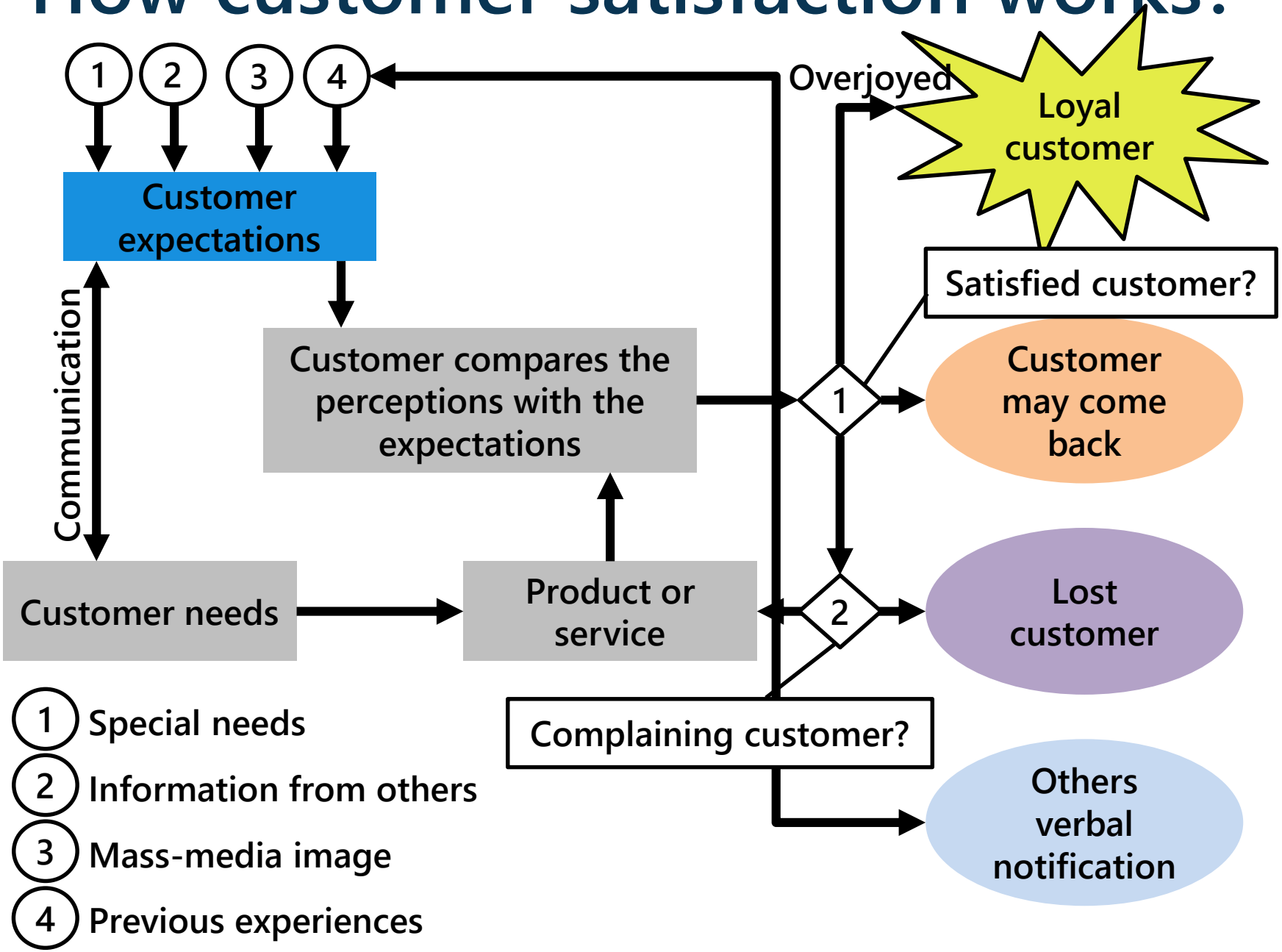
3rd level
Characteristics and properties that bring added value; the customer does not expect them ***(LATENT)***

2nd level
Options and compromises; the customer can choose from them
(EXPRESSED)

1st level
Minimum performance level; which's presence is always assumed ***(UNSPOKEN)***



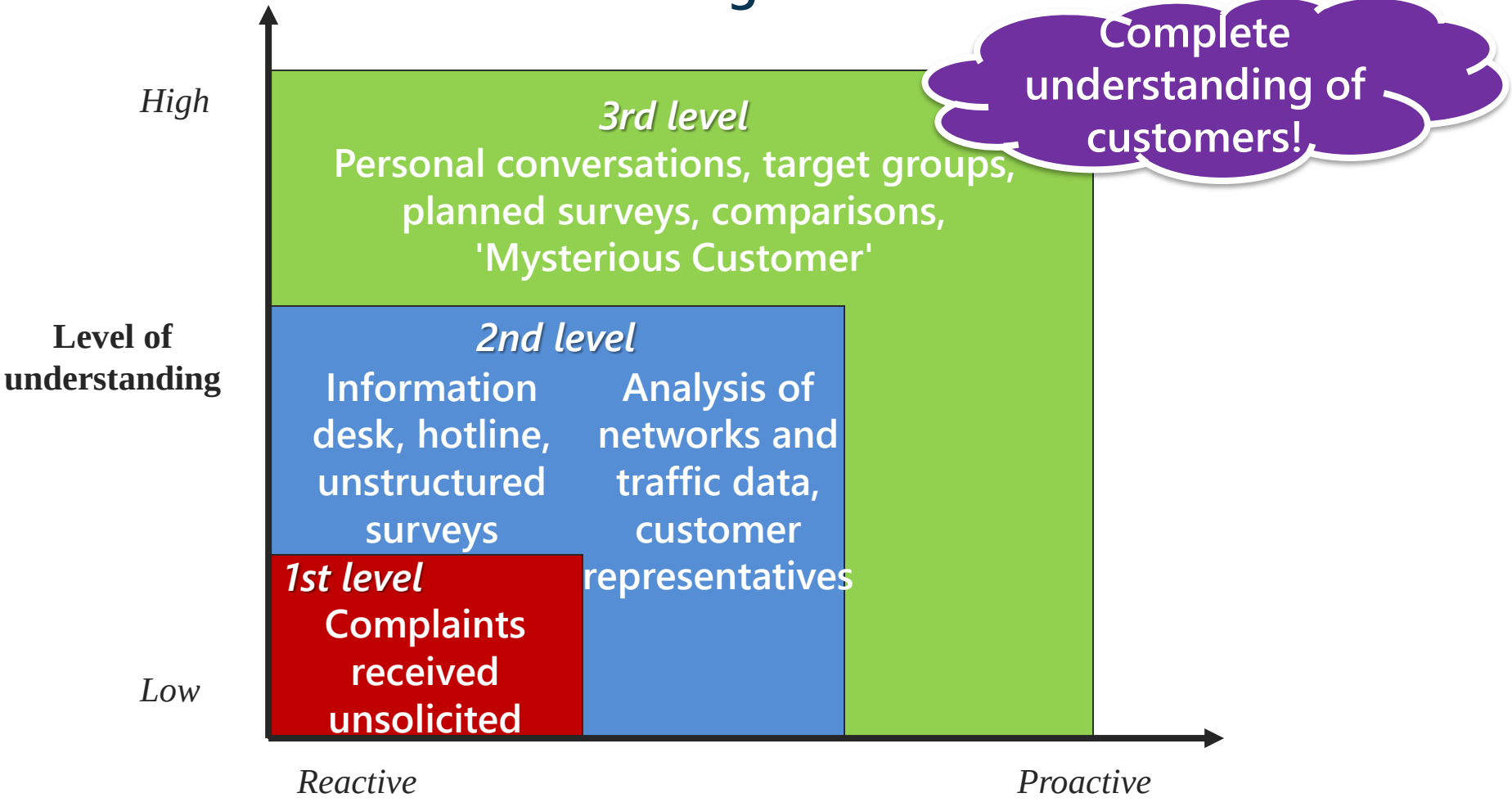
How customer satisfaction works?



Total Quality Management

1. Customer focus

Mechanisms for understanding customers



Understanding customer needs

1. What product / service features do customers want?

2. What level of performance is needed to meet their expectations?

3. What is the relative importance of the different characteristics?

4. How satisfied are customers with the current level of performance?

Understanding customer needs

What are the characteristics of quality products/services?

- Faster, better, cheaper
- 8 dimensions of quality
- 10 determinants for service quality

Why is it important to pay attention to quality?

Determinants of market competition – value for customers:

- **price** – cheaper
- **time** – faster
- **quantity** – more
- **quality** – better

Garvin' 8 quality dimensions for products

- Performance
- Features
- Reliability
- Conformance
- Durability
- Serviceability
- Aesthetics
- Perceived quality

What is a quality service?

- Berry's 10 determinants for service quality:
  - Reliability
  - Responsiveness
  - Competence
  - Access
  - Courtesy
  - Communication
  - Credibility
  - Security
  - Understanding the customer
  - Tangibles

Service Quality

Daunting task

Different dimensions to different industries

SERVQUAL

- Tangibles
- Reliability
- Responsiveness
- Assurance
- Empathy

A collection of quality features

	Deliverable things	Interrelationship
Faster	Accessibility	Responsiveness
	Comfort	Accessibility
Better	Performance	Reliability
	Extra features	Safety
	Reliability	Competence
	According to standards	Credibility
	Serviceability	Empathy
	Aesthetic appearance	Communication
	Perceived quality	Style
Cheaper	Price	

Product Quality

Quality is multidimensional

Garvin's eight dimensions

Not always maximize all of them

↓

Tradeoffs

Customer needs and satisfaction

The customer is unsatisfied, the desired features are not present

Customer wants it

Attention!	Bravo!
Do not worry, no problem!	Stop or communicate!

Customer doesn't get it

Customer get it

Customer doesn't want it

Stop the delivery or educate the customer about the benefits of our product

Dimensions, measures and metrics

- Use dimension to measure quality, they have to be operationalized – metrics
- Metrics (measurable characteristics): enable an assessment of the dimension they represent.

How would you measure the performance of an automobile?

- Include customer input into operationalizing quality dimensions

Dimensions, measures and metrics

- to find one set of dimensions to many types of services is hard
- relative importance of each dimension from the input obtained from customers

Dimensions, measures and metrics

Consider the case of a laser printer for use with a personal computer. Garvin's eight dimensions of product quality might be....

- Performance: pages per minute, print density
- Features: multiple paper trays, color capability
- Reliability: mean time between failures (MTBF)
- Conformance: UL rated, crispness of print relative to competitors
- Durability: estimated time to obsolescence, expected life of major components
- Serviceability: availability of authorized repair centers, number of copies per print cartridge
- Aesthetics: control button layout, case style
- Perceived quality: brand name recognition, rating in Consumer Reports, Rating in Byte magazine.

Dimensions, measures and metrics

Dimensions and Weights	
Dimension	**Weight**
Performance	0.30
Features	0.05
Reliability	0.15
Conformance	0.10
Durability	0.15
Serviceability	0.10
Aesthetics	0.05
Perceived Quality	0.10
Total	**1.00**

Dimensions, measures and metrics

Dimension	Measure	Metric	Raw value of Metric	Metric Score
Serviceability	Availability of repair centers (RC)	No. of RC within 50 mi.	2	7
	Life of cartridge	Rated no. of copies/cart.	2,000	5
Dimension score = $\frac{7+5}{2} = 6$ (assumes equal importance for metrics)				

Dimensions, measures and metrics

Compositing Metrics into a Raw Dimension Score			
Dimension	Weight	Brand X Score	Brand Y Score
Performance	0.30	8	7
Features	0.05	6	2
Reliability	0.15	5	6
Conformance	0.10	8	7
Durability	0.15	9	8
Serviceability	0.10	6	9
Aesthetics	0.05	7	9
Perceived Quality	0.10	9	6
Total	100.00		

Weighted Scores

Dimension	Weight	Brand X		Brand Y	
		Raw Score	Wtd. Score	Raw Score	Wtd. Score
Performance	0.30	8	2.40	7	2.10
Features	0.05	6	0.30	2	0.10
Reliability	0.15	5	0.75	6	0.90
Conformance	0.10	8	0.80	7	0.70
Durability	0.15	9	1.35	8	1.20
Serviceability	0.10	6	0.60	9	0.90
Aesthetics	0.05	7	0.35	9	0.45
Perceived Quality	0.10	9	0.90	6	0.65
Total			7.45		6.95

Focus Groups

A focus group is an unstructured interview conducted by a trained moderator in a relaxed, informal atmosphere with a small homogeneous group of respondents.

- richer information than surveys
- analyzing the data is challenging
- focus groups – qualitative information, surveys – generally quantitative
- tipically recorded (video, audio)
- moderator skills: open, lively, on-topic
- questions are presented by the moderator
- content analysis

Survey

The survey methodology is a form of descriptive research that uses "questionnaires given to a sample of a population and are designed to elicit specific information from respondents"

- typically structured (prearranged order, predetermined responses)
- someone skilled in questionnaire design, administration, analysis
- conduct in a variety of ways: mail, telephone, e-mail, web-based
- inexpensive and easy to analyse
- survey methodology is not simple: target population, sampling plan, survey instrument, response rate, data analysis

Quality Function Deployment

- Classification of quality functions
- QFD is a simple, systematic way to translate customer requirements and build them into the product
- ”Voice of the Customer”
- Continuous improvement

Quality Function Deployment

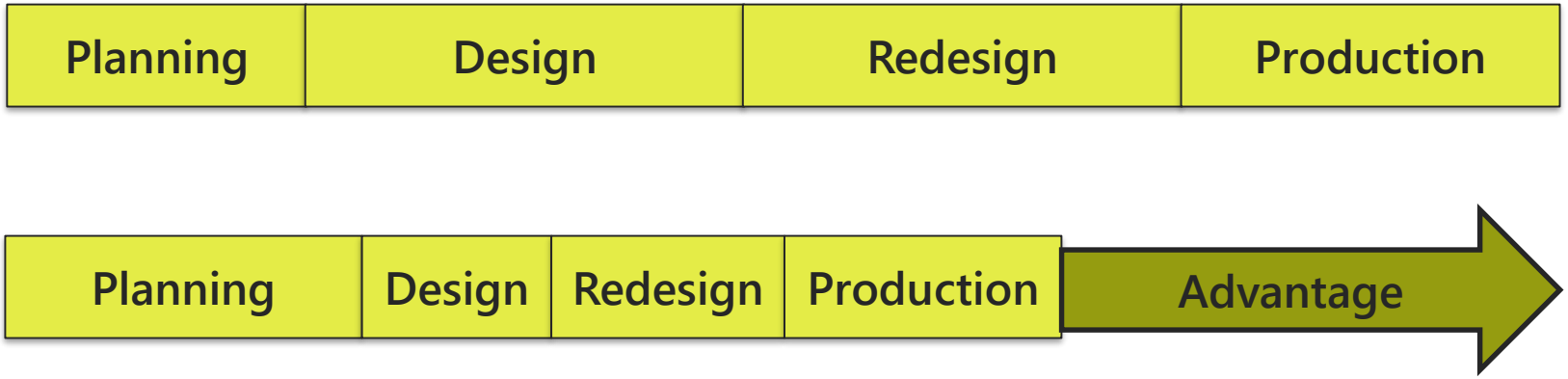
- Customers and engineers speak different language
- ”easy to start” (car) – ”car will start within 10 seconds of continuous cranking”
- ”soap leaves my skin feeling soft” – pH or hardness specifications for the bar of soap

Quality Function Deployment

- 1972 Mitsubishi
- 1977 Toyota: 1979, realized 20 % reduction in start-up costs on the launch of a new van…38%…61%
- 1986 Xerox and Ford: at that time, more than 50 % of major Japanese companies were already using the approach
- Automobiles, electronics, appliances, clothing, construction equipment
- Mazda, Motorola, Xerox, IBM, P&G, HP, AT&T, Supplier Institute, Inc., GOAL/QPC

Traditional vs QFD planning

- Better plan in a shorter time!
- Increasing productivity!



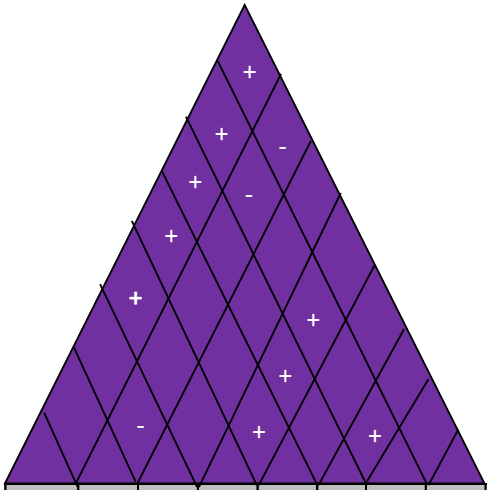
Basic steps

1. Identify customer requirements
2. Identify technical requirements
3. Relate the customer requirements to the technical requirements
4. Conduct an evaluation of competing products or services
5. Evaluate technical requirements and develop targets
6. Determine which technical requirements to deploy in the remainder of the production/delivery process

Quality Function Deployment

- Stages
  - ✓ Product/Service design
  - ✓ Detailed planning
  - ✓ Process design
  - ✓ Production planning
- Aim
  - ✓ Determining the importance of explicit and unspecified customer needs.
  - ✓ Translating needs into technical characteristics and specifications.
  - ✓ Create a quality product/service focusing on customer satisfaction.

QFD Planning



Type of Correlation
+ = Supportive
- = Impending

◎ :9 (high, strong relationship)
● :3 (medium)
△ :1 (weak)

		Authors/Editors Guide	Lower Cost Production	Enhanced Durability	Text Clarity	Flowing Text Sequence	Effective Artwork	Colour Emphasis	Ch. Aims/Summaries	CS Rating Our Textbooks	CS Rating Competitor A	CS Rating Competitor B	Our Planned CS Rating	Improvement Factor	Sales Point	Overall Weighting	% of Total Weight
Comprehensible text	5	◎			◎	●				4	5	4	5	1.2	1.1	6.6	13
Easily readable fonts	3				△					3	5	5	5	1.4	1.0	4.2	8
Accuracy	5	◎					△			4	4	5	5	1.2	1.5	9.0	18
Plausible examples	3	◎								2	3	4	4	1.4	1.2	5.0	10
Chapter objectives	3								◎	2	4	2	4	1.4	1.3	5.5	11
Consistent writing style	2	●								4	3	4	4	1.0	1.0	2.0	4
Withstand heavy use	3			◎						3	5	3	4	1.2	1.3	4.7	9
Affordable	4		◎							1	2	2	3	1.4	1.5	8.4	16
Use of colour	3							◎		1	3	4	3	1.4	1.4	5.9	12
Technical Priorities		191.4	75.6	42.3	63.6	19.8	9	53.1	49.5								
% of Total Priorities		38	15	8	13	4	2	11	10								
Technical Benchmarking	Our Product	5	$40	1.1	7	No	7	0%	No								
	Competitor A	6	$34	1.5	10	Yes	7	15%	Yes								
	Competitor B	7	$34	1.2	9	No	9	25%	No								
Design Targets		8	$30	1.4	10	Yes	9	15%	Yes								

QFD Planning

- Gather the customer needs
- Define dimensions/groups
- Customer importance (1-5, 5 being the most favorable)

Comprehensible text	5
Easily readable fonts	3
Accuracy	5
Plausible examples	3
Chapter objectives	3
Consistent writing style	2
Withstand heavy use	3
Affordable	4
Use of colour	3

QFD Planning

- Customer rating
- Competitor's product ratings
- Planned satisfaction rating target (1-5)
- Improvement factor:
  {(planned-perceived)*0.2}+1
- Sales point: marketing importance 1-1.5 (emphasis on the customer needs)
- Overall weighting:
  customer importance*improvement factor*sales point
- Percentage of Total Weighting:
  (overall weighting/ sum of overall weighting)*100

CS Rating Our Textbooks	CS Rating Competitor A	CS Rating Competitor B	Our Planned CS Rating	Improvement Factor	Sales Point	Overall Weighting	% of Total Weight
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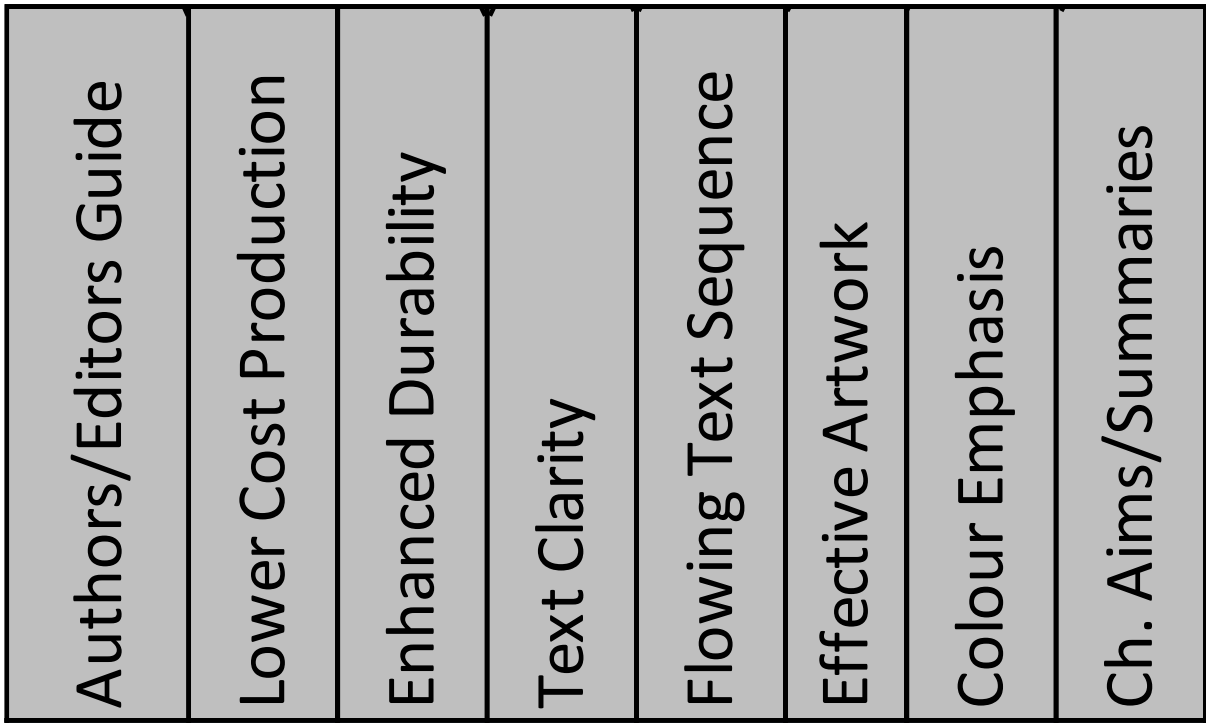
3	5	5	5	1.4	1.0	4.2	8
4	4	5	5	1.2	1.5	9.0	18
2	3	4	4	1.4	1.2	5.0	10
2	4	2	4	1.4	1.3	5.5	11
4	3	4	4	1.0	1.0	2.0	4
3	5	3	4	1.2	1.3	4.7	9
1	2	2	3	1.4	1.5	8.4	16
1	3	4	3	1.4	1.4	5.9	12

QFD Planning

- How the company intends to respond to each of the customer needs
- Voice of the company
- They are not design specifications!!!
- They are measurable in terms of satisfactory achievement.
- Characteristics and features



QFD Planning

- How the technical requirements relate to the customer needs?

◎ :9 (high, strong relationship)
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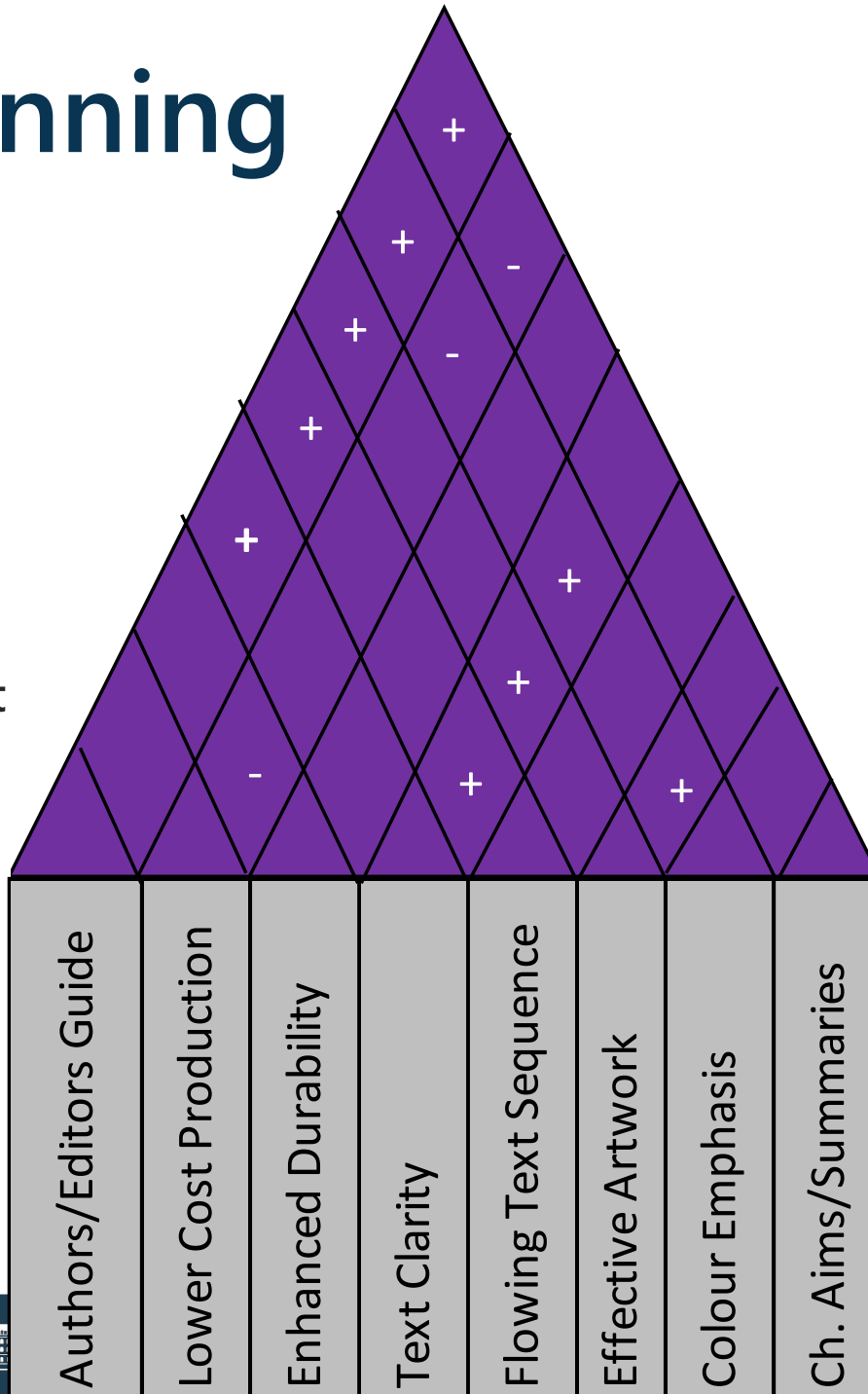
Chapter objectives	3								◎
Consistent writing style	2	●							
Withstand heavy use	3			◎					
Affordable	4		◎						
Use of colour	3							◎	

QFD Planning

- Supportive: +
- Impeding: -
- No correlation

Does improving this technical requirement result in the other's improvement, or does it result in degradation of the other?



QFD Planning

- Technical priorities: multiplying the interrelationship ratings with the overall weightings and then sum the coloumns
- % of Total Priorities: (Technical Requirement Priority/ sum Technical Priorities)*100
- Technical Benchmarking is intended to provide specific information on where the organization' current product stands relative to competing products, with resperct to each of the technical requirements. The source of information may come from everywhere e.g. customers, press, focus groups.
- Design targets: specific obejectives for the design team

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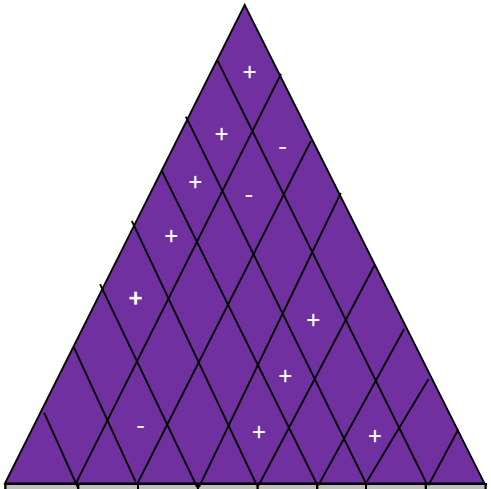
QFD Planning



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Practice - QFD

- Choose a product/service.
- One, which you tried out, met already and know at least 3 brands in connection.
- One brand is going to be you, the other two are the competitors.
- Fill in the QFD. (10 customer needs, min. 9 technical requirements)
- According to the QFD results, pinpoint 3 strategy for your brand in details.
- +1 point for the totally filled in surveys.

Thank you for your kind attention!

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