# Quality Management of Software and Systems (WS13/14)

## Problem Set 6

Due: in exercise, 03.02.2016

#### **Problem 1: Quality Function Deployment Basics**

- a) What is the fundamental idea of QFD?
- b) What are the goals of QFD?
- c) What is the procedure followed to apply QFD?

#### **Problem 2: Quality Function Deployment Process**

How is QFD applied in the requirement analysis phase? (Please support your explanation by drawing a graph) What are the different activities and products obtained? Please give a short description of each one.

#### **Problem 3: The house of quality**

- a) What is the goal of the house of quality?
- b) Complete and explain the steps of the house of quality by using the following graph:



#### Problem 4: QFD Case Study Navigation System

A car company would like to improve the navigation system currently installed in its cars. For this purpose, they hired the car navigation system producer company "Nagivation2000". The customer segments to be considered when developing the new system are:

- Car test drivers
- People in the quality assurance department
- System integrators
- Manager

Your task will be to help "Navigation2000" to analyze the requirements by applying QFD. In particular, you will have to determine:

- I. The importance of each customer segment (determination of target groups)
- II. The importance of customer requirements

In order to do this, the following information is given to you (see Appendix):

- Important criteria for the company: "criteria priorities" table
- Incomplete version of the "transfer of criteria priorities" table
- Customer voice table (with the initial requirements)
- Customer context tables

To determine the importance of each customer segment, you will have to perform the following activities:

- a) Normalize the "criteria priorities" table
- b) Complete the transfer of criteria priorities table: Calculate the segment priority

To determine the importance of customer requirements you will have to perform the following activities:

- c) Create an affinity diagram for the customer voice table
- d) Create a hierarchy diagram by using the customer context table and the affinity diagram
- e) Create a "customer segments customer requirements" table based on the hierarchy diagram and the customer segments priority

### Appendix

- 1. Information about the scale to be used to set priorities:
  - unimportant = 0
  - minor important = 1
  - mean = 3
  - strong = 5
  - very strong = 7
  - extremely strong = 9
- 2. Criteria priorities table:

|                               | saleable number | buying decision ability | multiplier effect |
|-------------------------------|-----------------|-------------------------|-------------------|
| saleable<br>number            | 1               | 0,2                     | 0,33              |
| buying<br>decision<br>ability | 5               | 1                       | 3                 |
| multiplier<br>effect          | 3               | 0,33                    | 1                 |
|                               | Σ9              | ∑ 1,53                  | ∑ 4,33            |

3. Transfer of criteria priorities table:

|            | Car test   | Quality    | System     | Manager   |                |
|------------|------------|------------|------------|-----------|----------------|
|            | driver     | Assurer    | Integrator |           |                |
| saleable   | sale: 7000 | sale: 2000 | sale: 1000 | sale: 500 | $\Sigma$ 10500 |
| number     | local:     | local:     | local:     | local:    | $\Sigma$ 1     |
| priority:  | global:    | global:    | global:    | global:   | Σ              |
| buying     | 1          | 3          | 3          | 5         | $\sum$ 12      |
| decision   | local:     | local:     | local:     | local:    | $\sum$ 1       |
| ability    | global:    | global:    | global:    | global:   | Σ              |
| priority:  |            |            |            |           |                |
| multiplier | 1          | 3          | 3          | 5         | $\sum$ 12      |
| effect     | local:     | local:     | local:     | local:    | $\Sigma$ 1     |
| priority:  | global:    | global:    | global:    | global:   | Σ              |
| Segment    | Σ          | Σ          | Σ          |           |                |
| priority   |            |            |            |           |                |

#### 4. Customer voice table

| Customer Requirement             | Technical Restrictions         | Costs     |
|----------------------------------|--------------------------------|-----------|
| Touchscreen                      | Only resistive touchscreen     | Low       |
|                                  | supported                      |           |
| Automatic updating of maps       |                                |           |
| and routes                       |                                |           |
| Traffic jam reporter             | Integration with ADAC reporter | Very High |
|                                  | system                         |           |
| Deviation assistant              |                                |           |
| Switching to night navigation    |                                |           |
| mode                             |                                |           |
| Points of interest search        |                                |           |
| function (POI)                   |                                |           |
| Registering of favorite          |                                |           |
| addresses/places                 |                                |           |
| Calculation of the shortest      |                                |           |
| route                            |                                |           |
| Calculation of the fastest route |                                |           |

#### 5. Customer context tables:

|        | Wh     | o?   | When?    | Where? | Why?           | What?      | How?    |
|--------|--------|------|----------|--------|----------------|------------|---------|
| is     | Car    | Test | Working  | Street | Testing of all | Route from | Driving |
|        | Driver |      | time     |        | functionality  | Munich to  | mode    |
|        |        |      |          |        |                | Ingolstadt |         |
|        |        |      |          |        |                | approx. 80 |         |
|        |        |      |          |        |                | km.        |         |
| is not |        |      |          |        |                |            |         |
| event. |        |      | Weekends |        |                |            |         |
|        |        |      | and      |        |                |            |         |
|        |        |      | evenings |        |                |            |         |

|        | Who?    | When?   | Where?  | Why?        | What?     | How?       |
|--------|---------|---------|---------|-------------|-----------|------------|
| is     | Quality | Working | Car     | Progress    | Points of | Trial mode |
|        | Assurer | time    | company | and quality | interest  |            |
|        |         |         | track   | control     | near by   |            |
| is not |         |         |         |             |           |            |
| event. |         |         |         |             |           |            |

|        | Who?                 | When?           | Where?                   | Why?                                       | What?                | How?       |
|--------|----------------------|-----------------|--------------------------|--|----------------------|------------|
| is     | System<br>Integrator | Working<br>time | Car<br>company<br>garage | Test<br>integration<br>with car<br>console | Route<br>calculation | Trial mode |
| is not |                      |                 |                          |  |                      |            |
| event. |                      | Evenings        |                          |  |                      |            |

|        | Who?    | When?    | Where?     | Why?           | What?      | How?    |
|--------|---------|----------|------------|----------------|------------|---------|
| is     | Manager | Evenings | Street and | Testing of all | Switching  | Driving |
|        |         |          | car        | functionality  | to night   | mode    |
|        |         |          | company    |                | navigation |         |
|        |         |          | track      |                | mode       |         |
| is not |         |          |            |                |            |         |
| event. |         | Weekends |            |                |            |         |