9.1/7

TM 105/205, Lecture #9 (10/24/13)

Agenda:

- Quality Function Deployment (QFD)
  - House-of-Quality (HOQ)

Example: Car Door

On the midterm: HOQ for a Video Game Console

- Midterm

House-of-Quality (HOQ)

Quality Function Deployment Institute
www.qfdi.org
(has the HOQ template)
methods developed in Japan (shipbuilding, Car industry → Toyota)

Process for constructing an HOQ
Example: Car Door

1. Make a structured list (1) of the customer needs for the intended product (based on market research; focus groups, surveys, etc.) & assess the importance of each need (2)

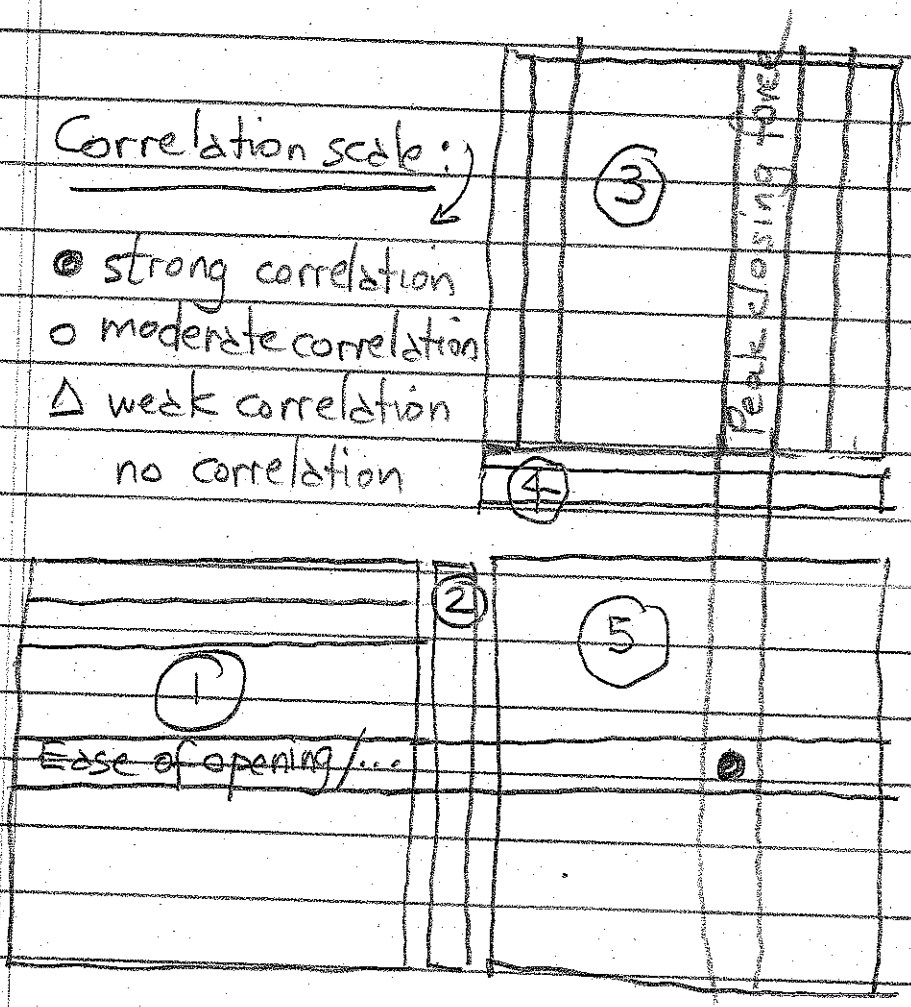
(1) Customer Needs	(2) Importance
Easy to open/close	7/10
⋮	
Leak-proof	9/10
Isolate road noise	6/10
⋮	⋮

Step 2. Make a list of the technical metrics (3) and assess the importance of each metric (4)

Technical metrics (3) →	Energy to open/close door	..	Peak closing force	..	Noise reduction (dB)
Importance (4)	6/10	..	8/10	..	7/10

Step 3: Correlate the customer needs & technical metrics using a convenient scale. The result is a correlation matrix (5).

For example: The customer need "ease of opening/closing door" is correlated to the technical metric "peak closing force"



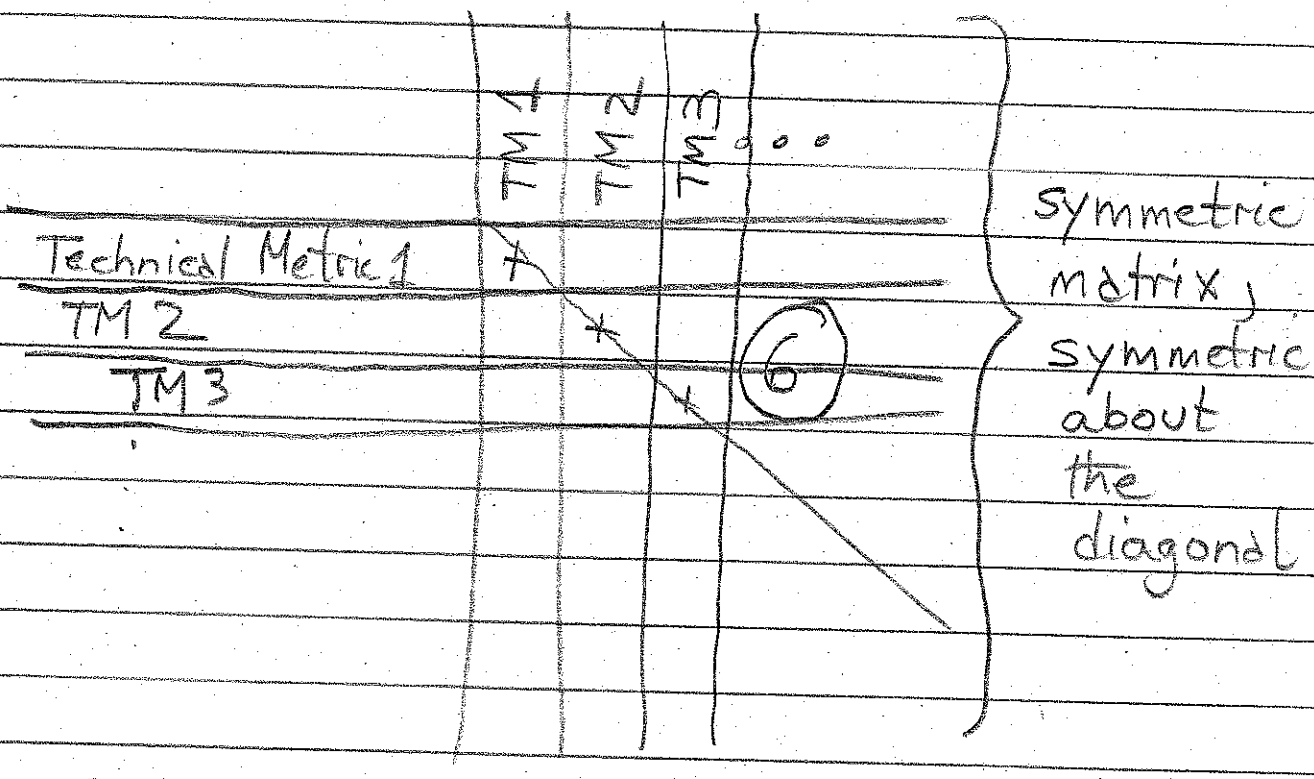
Step 4 There are dependencies among the technical metrics

e.g. Energy = (force) * (distance)

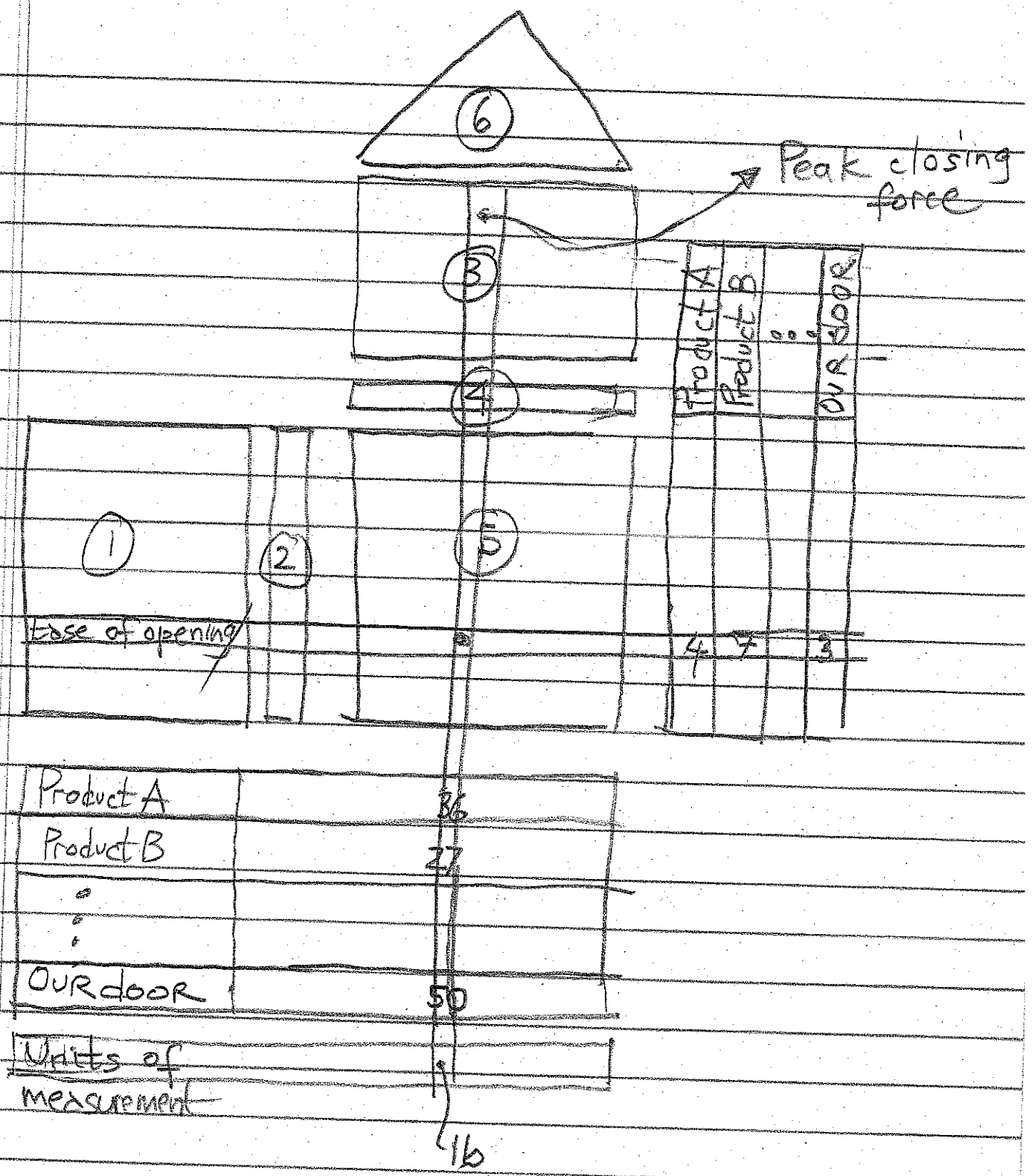
⇒ "energy required to open/close door" is positively correlated to "peak closing force"

(a) Correlate the technical metrics with each other using a convenient scale

+ : strong positive correlation
− : strong negative correlation
: no correlation



(b) Place the "half" (of the above matrix) above the diagonal, (6), on top of (5) & (3)


6
Peak closing force
3
4
1
2
5
Ease of opening
Product A
Product B
...
Our door
4
7
3
Product A
Product B
:
Our door
Units of measurement
86
27
50
lb

Step 5: Benchmarking

Assess a set of competing from the viewpoint of customers (customer benchmarking, (7)), and from a technical standpoint (technical benchmarking, (8)) using convenient scales (for the customer) & engineering units of measurement (for the technical metrics).

Step 6: Use the HOQ to set targets for

Customer Needs (9)		Technical metrics (10)
Low Cost	7/10	Peak closing force = 30lb
Appearance	5/10	Noise level : 5db
⋮		⋮

Also read the book chapter on Product Specifications in QFD, PD&D (Bicycle fork suspension example)