CS445 / ECE451 / CS645 / SE463

Software Requirements Specification & Analysis

Prioritizing Requirements

Prioritizing Requirements

- There are more requirements than can be implemented
- Need to balance requirements against limitations in budget, staff, schedule
- Need to decide which features go into the next release
  - requirements triage
  - minimum viable product (MVP)
  - timeboxes

Prioritizing Requirements

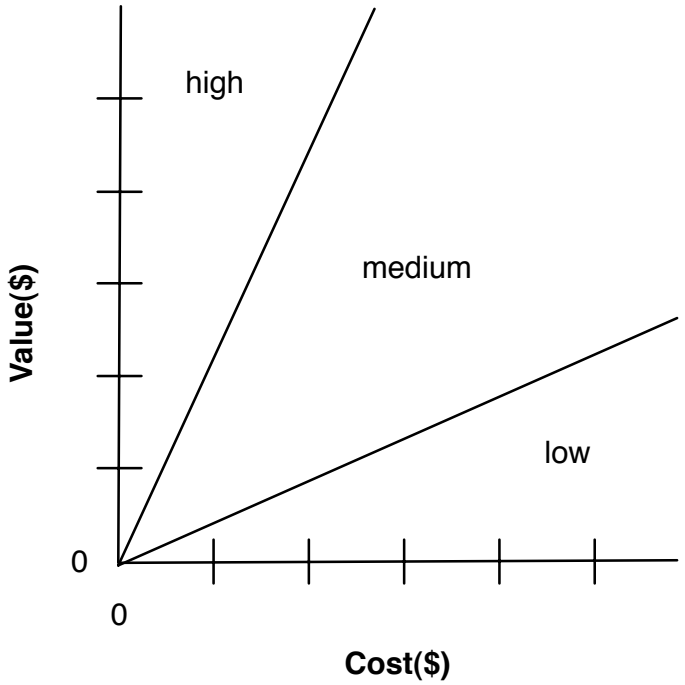
Prioritization by importance. Prioritizing requirements is determining the order of importance of the requirements to some stakeholder or class of stakeholders according to some prioritization criteria.

Prioritization by implementation order. Prioritizing requirements is the task of determining the implementation order of the requirements in an incremental and iterative development cycle.

Prioritization Criteria

Most companies prioritize requirements by their potential value and cost.

- Value is a requirement's potential contribution to customer satisfaction
- Cost is the cost of implementing the requirement
- Can prioritize requirements according to their cost-value ratios



Grouping Requirements

The most common prioritization technique is numerical assignment or grouping of requirements into 3-4 priority groups.

- Critical
- Standard
- Optional

Ranking Requirements

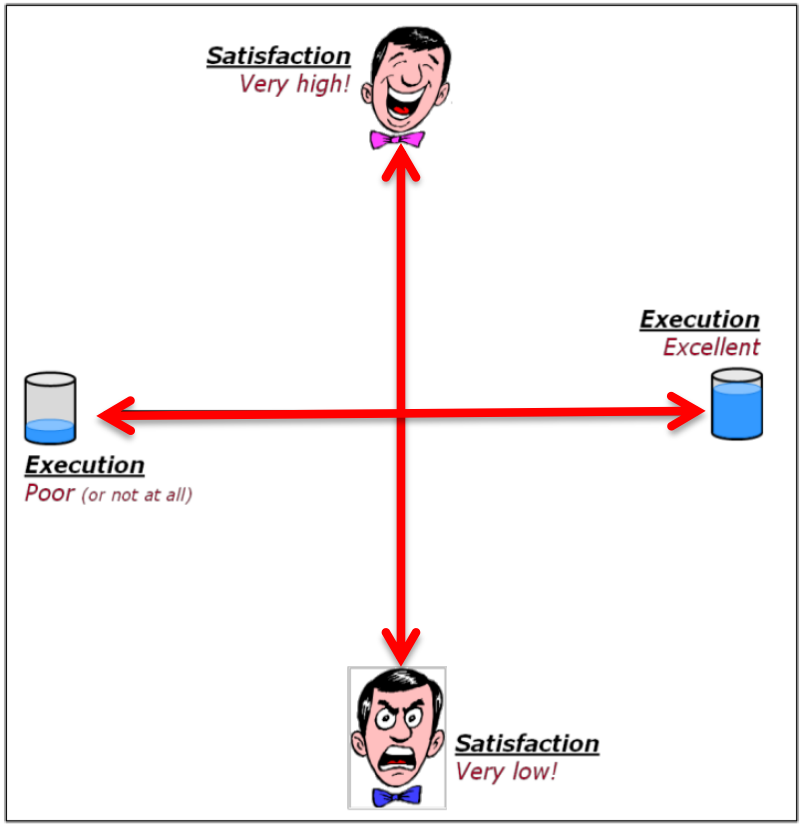
Each requirement is assigned a unique rank (1, 2, …), but it is not possible to see the relative difference between ranked requirements.

100-Dollar Test

In cumulative voting, or the 100-dollar test, stakeholders are given 100 prioritization points (votes) to distribute among the requirements.

Kano Model

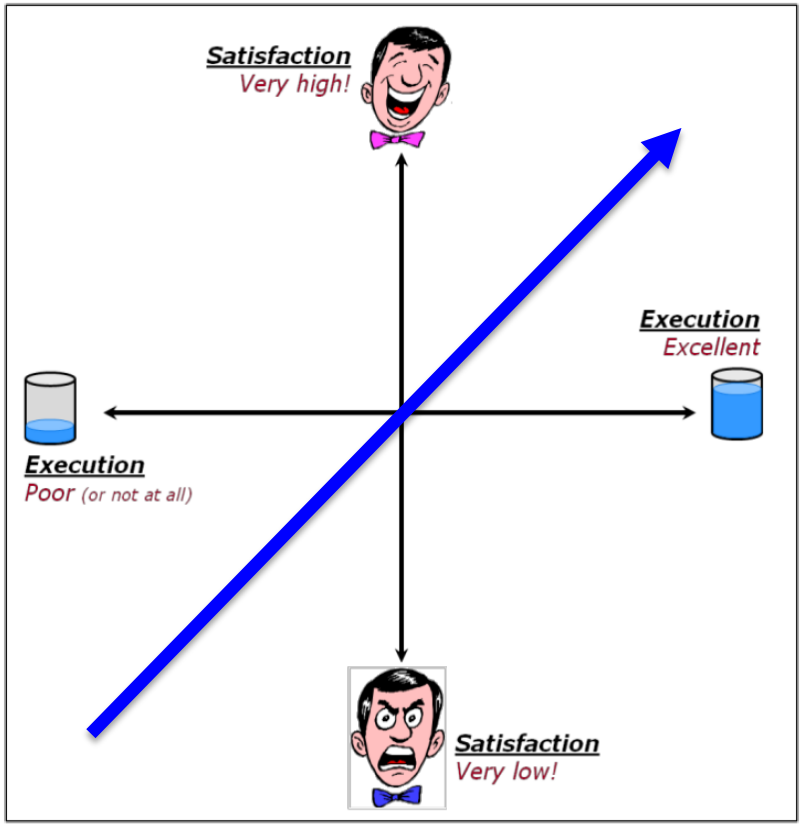
The Kano Model is a method for grouping requirements based on customer perception, in order to select the requirements that deliver the greatest customer satisfaction.



Performance Requirements

The Kano Model is a method for grouping requirements based on customer perception, in order to select the requirements that deliver the greatest customer satisfaction.

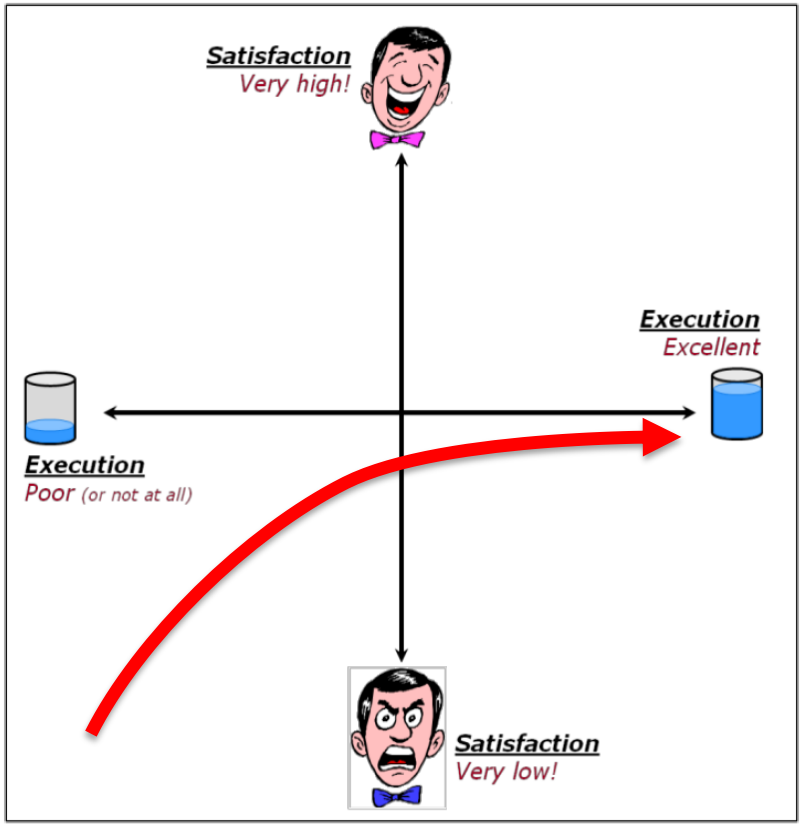
Performance: requirements that the customer specifically asked for



Basic Requirements

The Kano Model is a method for grouping requirements based on customer perception, in order to select the requirements that deliver the greatest customer satisfaction.

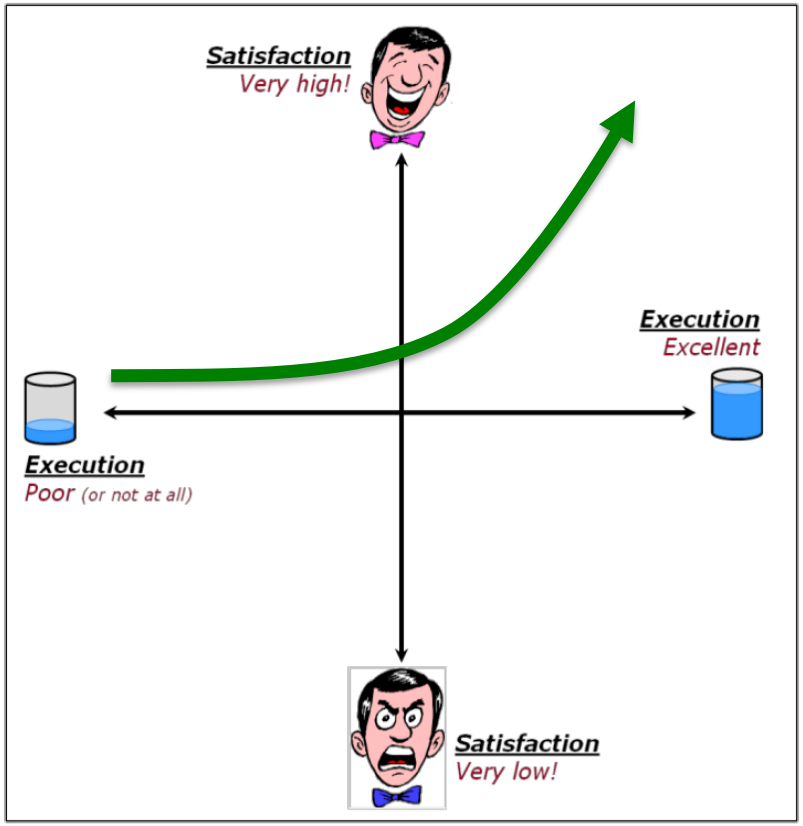
Basic: requirements that the customer takes for granted



Excitement Requirements

The Kano Model is a method for grouping requirements based on customer perception, in order to select the requirements that deliver the greatest customer satisfaction.

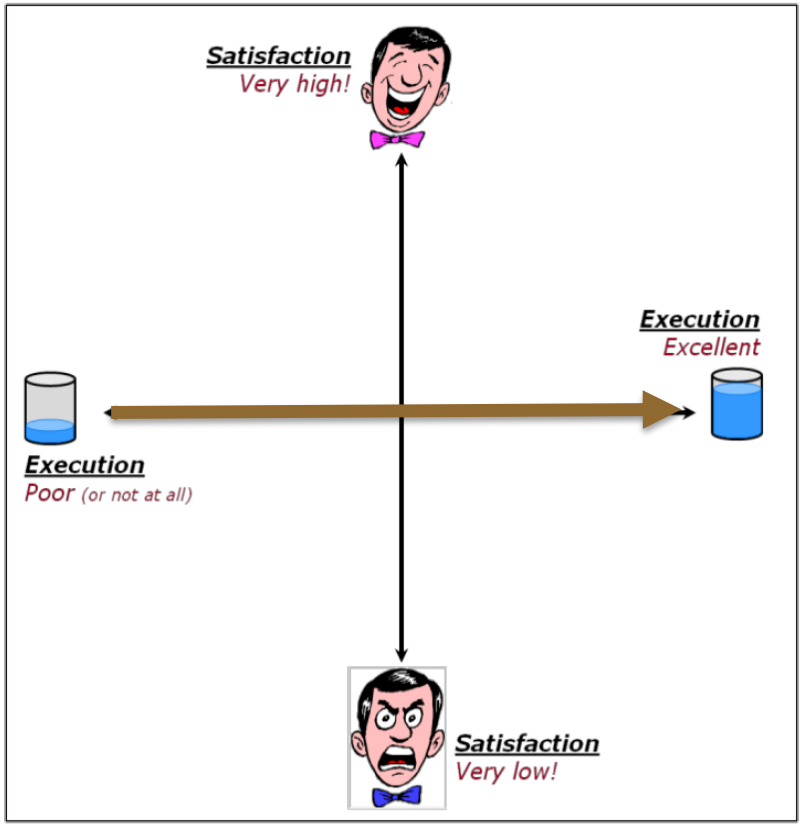
Excitement: requirements that the customer does not request or expect



Indifferent Requirements

The Kano Model is a method for grouping requirements based on customer perception, in order to select the requirements that deliver the greatest customer satisfaction.

Indifferent: requirements that the customer does not care about



Kano Surveys

1. Ask customers what their reaction would be if the requirement were included in the product
2. Ask customers what their reaction would be if the requirement were NOT included in the product.

The possible answers are

- I like it
- I expect it
- I am neutral
- I can tolerate it
- I dislike it

Kano Evaluation Table

Customer Survey Responses		Dysfunctional Question Answer				
		Like	Expect	Neutral	Tolerate	Dislike
Functional Question Answer	Like	*Questionable*	Excitement	Excitement	Excitement	Performance
	Expect	Reverse	*Questionable*	Indifferent	Indifferent	Basic
	Neutral	Reverse	Indifferent	Indifferent	Indifferent	Basic
	Tolerate	Reverse	Indifferent	Indifferent	*Questionable*	Basic
	Dislike	Reverse	Reverse	Reverse	Reverse	*Questionable*

Basic > Performance > Excitement > Indifferent

Kano Categorization Plane

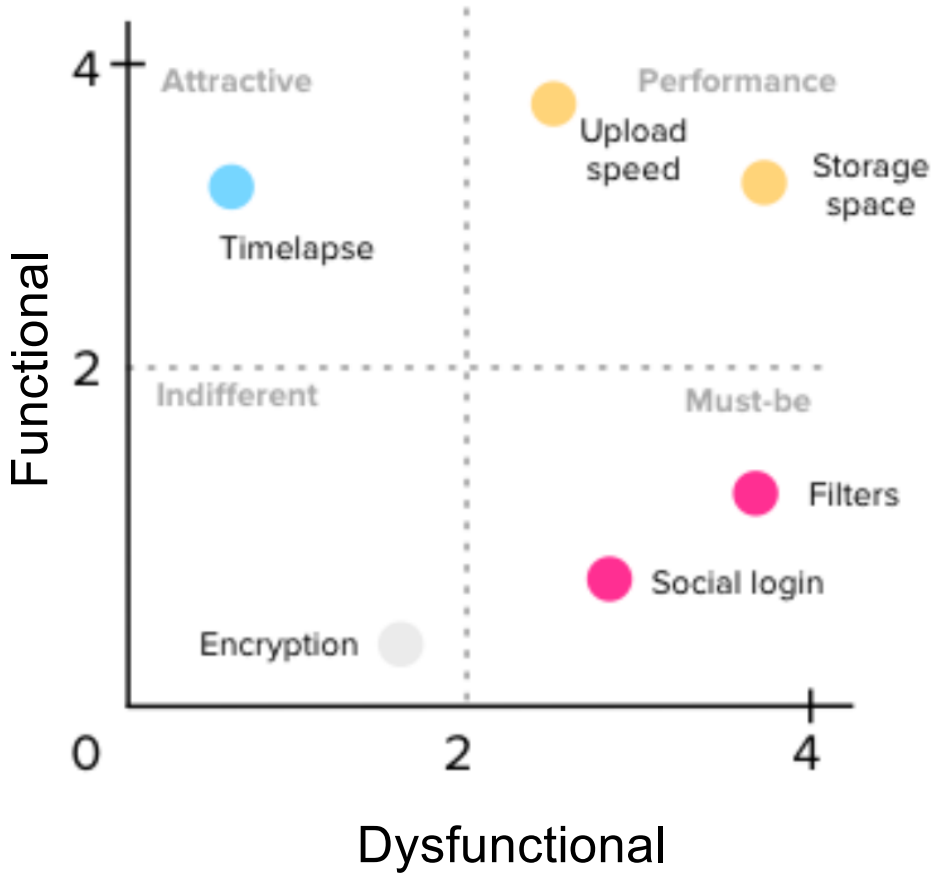
If combining the results of multiple surveys, better to score the survey results and plot the **averages** and **standard deviations**.

Kano Categorization Plane

If combining the results of multiple surveys, better to score the survey results and plot the **averages** and **standard deviations**.

Functional:
- -2 (Dislike)
- -1 (Live with)
- 0 (Neutral)
- 2 (Must-be)
- 4 (Like)

Dysfunctional:
- -2 (Like)
- -1 (Must be)
- 0 (Neutral)
- 2 (Live with)
- 4 (Dislike)



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Dysfunctional:
- -2 (Like)
- -1 (Must be)
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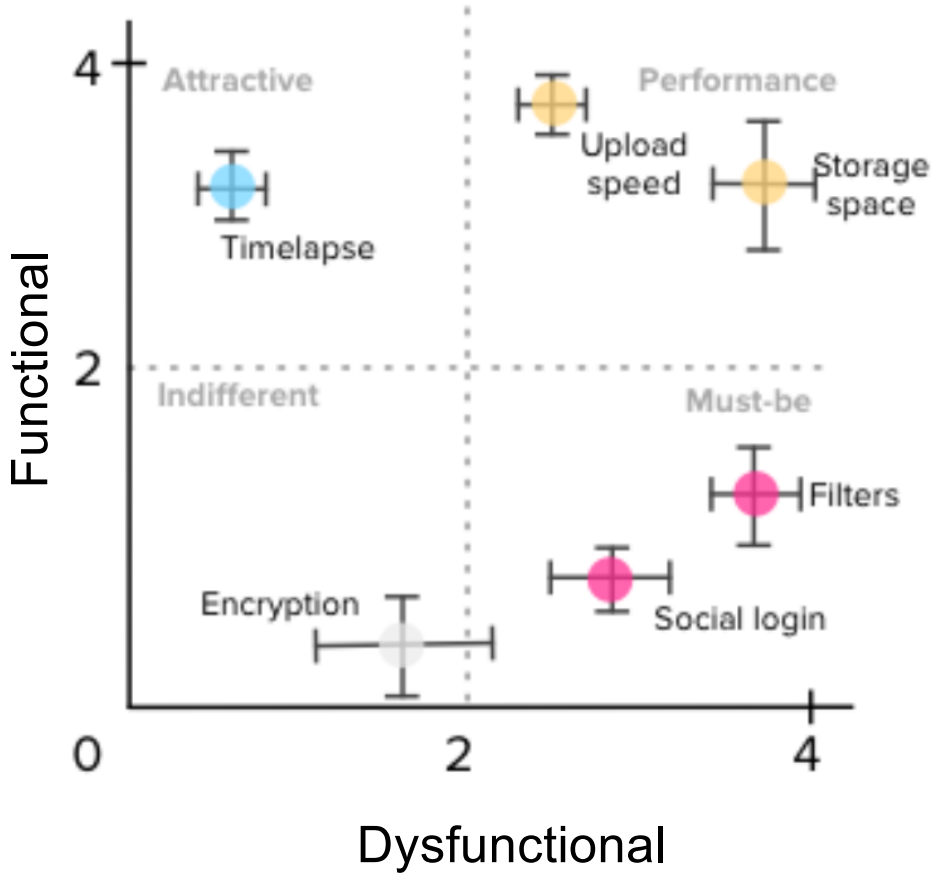
- 2 (Live with)
- 4 (Dislike)



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- 0 (Neutral)
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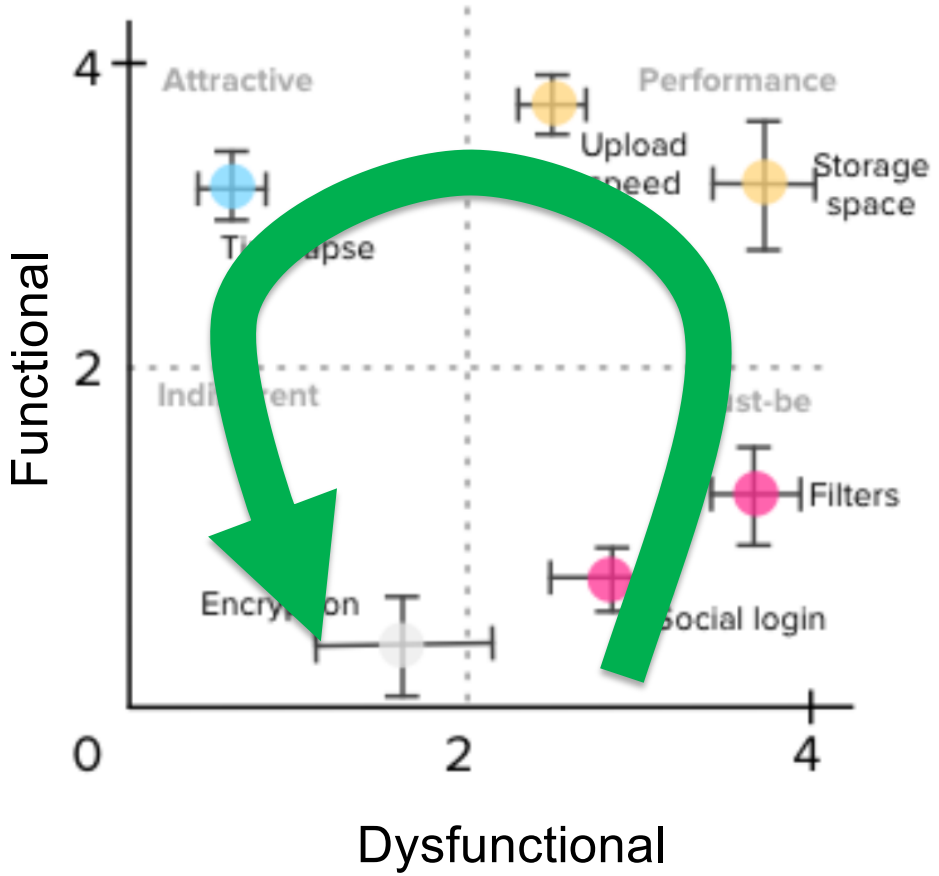
- 4 (Like)

Dysfunctional:
- -2 (Like)
- -1 (Must be)
- 0 (Neutral)
- 2 (Live with)
- 4 (Dislike)



Which to Choose?

Technique	Scale	Granularity	Sophistication
Priority Levels	Ordinal	Coarse	Very Easy
Ranking	Ordinal	Medium	Easy
100-dollar-test	Ratio	Fine	Complex
Kano Model (table)	Ordinal	Coarse	Complex
Kano Model (graph)	Ratio	Fine	Very Complex

References

Karl E Wiegers and Joy Beatty. *Software Requirements, 3ed*. Microsoft Press, 2013.

Chapter 16: “First Things First: Setting Requirements Priorities”