

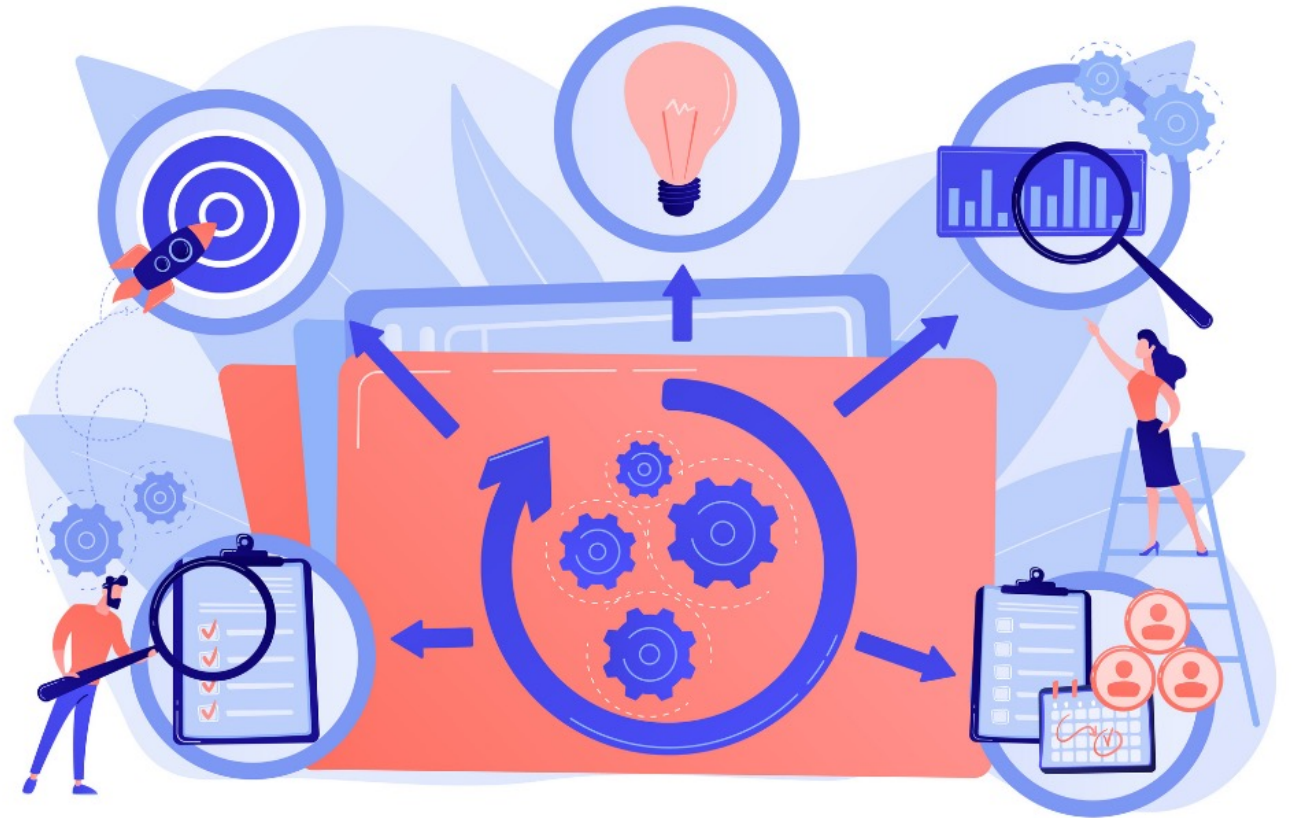
Product Specifications

Group 2

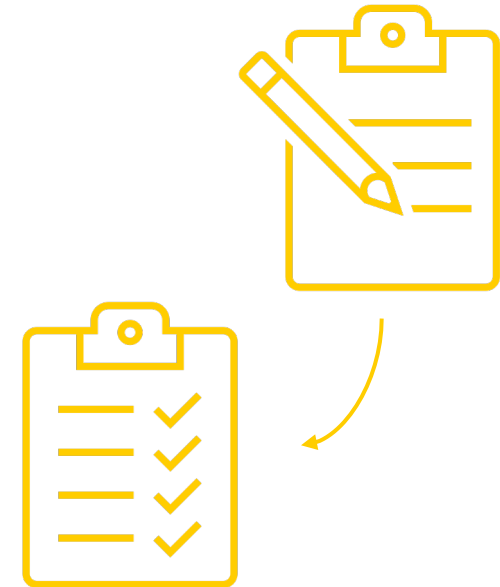
Tanzin Ahmed, Aku Karhinen,
Jenni Alitalo, Saana Mattila

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Aalto University



- 1 **What are product specifications?**
- 2 **When are specifications established?**
- 3 **Establishing target specifications**
- 4 **Developing final specifications**



What are product specifications?

Product specifications are a combination of

- User personas
- User stories
- Business case
- Design
- Product summary
- Functional specifications



5 tips for writing a good product specifications

Review
customer
feedback

Initiate
internal
discussions

Determine
product
requirements

Conduct
user testing

Revise &
release

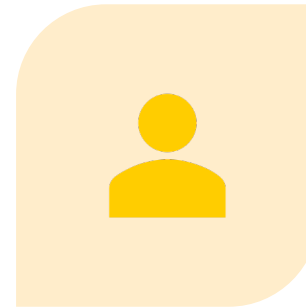
Importance of product specifications



CRITICAL EARLY STAGE OF
PRODUCT DEVELOPMENT
BECAUSE IT REQUIRES CRITICAL
THINKING



CAN REPRESENT WHAT YOU ARE
BUILDING, FOR WHOM & WHAT
THE OUTCOME SHOULD BE



SERVES ESSENTIAL CONTEXT &
GUIDELINE FOR THE PRODUCT
DEVELOPER



IF THE SPECIFICATIONS ARE
REALLY GOOD THEN IT ALSO
PROVIDES CLARITY SUCH AS
KEEPS TEAM ON TRACK, HELPS
AVOID COSTLY
MISCOMMUNICATION

What should be the steps of establishing Product Specifications?

Identifying the needs

Set target specifications

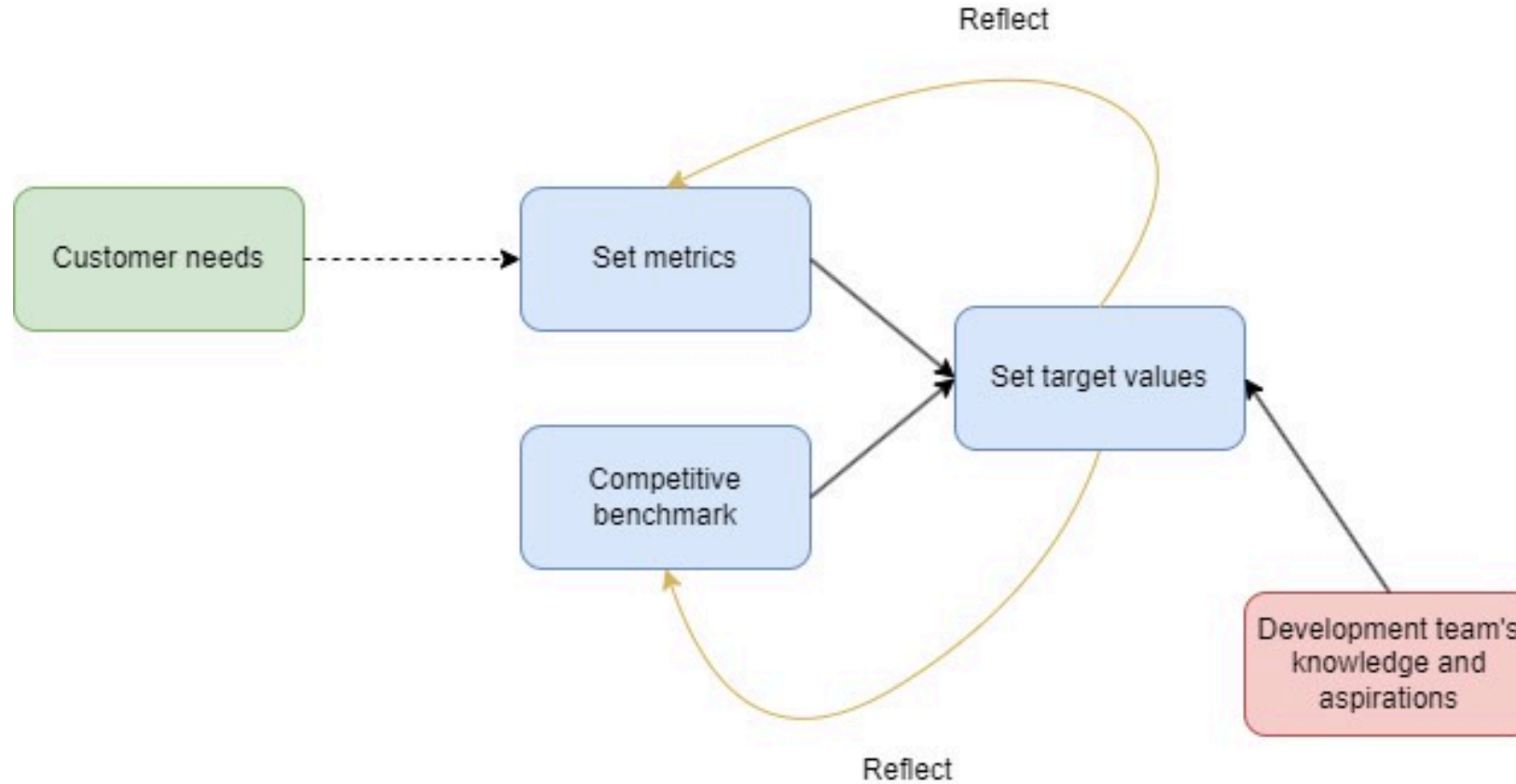
Refined the target specifications to avoid failure
or exceed the concept

Assessing technological constraints and
production costs

Revisit the target specifications

Set the final specifications

Establishing target specifications



Translating customer needs into measurable metrics

Metrics should:

- **Accurately translate needs into measurable form**
- **Include popular criteria**
- **Be practically measurable**

Example: Backpack Needs-Metrics Matrix

		1	2	3	4	5	6	7	8
	School backpack								
	Metric	Backpack needs to withstand a load of () kg	Has the inner capacity of () Litres	Handles withstand () N of force	Can be stored in () m ³ of space	Adjustable handles	Materials and labour are ethical	Backpack has been designed fashionably	Backpack has several compartments
	Need								
1	Durable	X		X					
2	Holds school supplies/laptop	X	X						
3	Easy to wear					X			
4	Easy to store				X				
5	Fashionable							X	
6	Ethical						X		
7	Convenient				X	X			X

Collecting competitive benchmarking data

Collect information about existing products

- **Measurements**
- **Disassembly**
- **Analysis**
- **...**

Collect public perception of existing products

- **Customers score needs on importance**
- **Customers score products on how well they have met the need**

Example: Backpack Competitive Benchmarking chart

	Need
1	Durable
2	Holds school supplies/laptop
3	Easy to wear
4	Easy to store
5	Fashionable
6	Ethical
7	Convenient

Metric No.	Need Nos	Metric	Backpack 1	Backpack 2	Backpack 3	Backpack 4
1	1,2	Backpack withstands () kg	30kg	33,4kg	50kg	25kg
2	2	Capacity of () litres	20L	30L	25L	23,3L
3	1	Handles withstand () N	350N	400N	600N	300N
4	4,7	Storable in () cm ³	3000cm ³	6000cm ³	5000cm ³	2000cm ³
5	3,7	Adjustable handles	45cm-60cm	40cm-50cm	45cm-65cm	30cm-70cm
6	6	Ethical materials and labour	No	Yes	Yes	Yes
7	5	Fashionable design	*****	**	***	**
8	7	Amount of compartments	2	4	4	5

Setting target values

Target values are not final

- Often set with two separate values:
 - Ideal values
 - Acceptable values

Establish boundaries of a viable product space

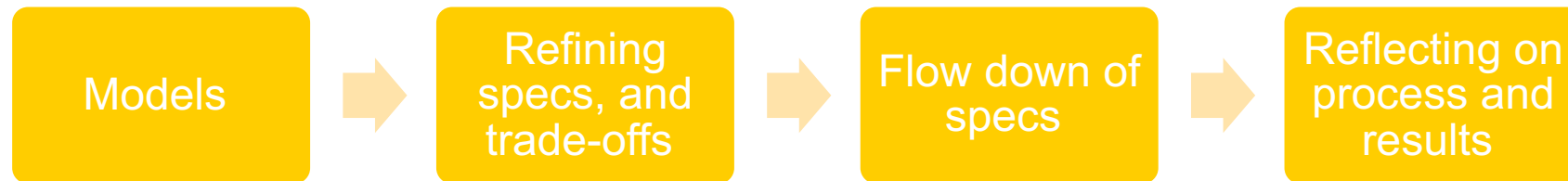
- Values that need to be ideal
- Values that can be in the acceptable value range

Reflection

Reflect before each iteration

- **Need?**
- **Realistic?**
- **Missing?**

Setting the final specifications





Developing models of the product

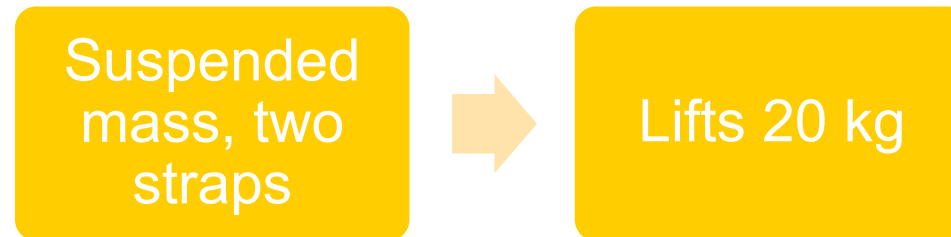
Technical models

- Analytical
- Physical

Example:

INPUT (independent design variable from product concept)

OUTPUT
(metric value)





Developing models of the product

Cost models

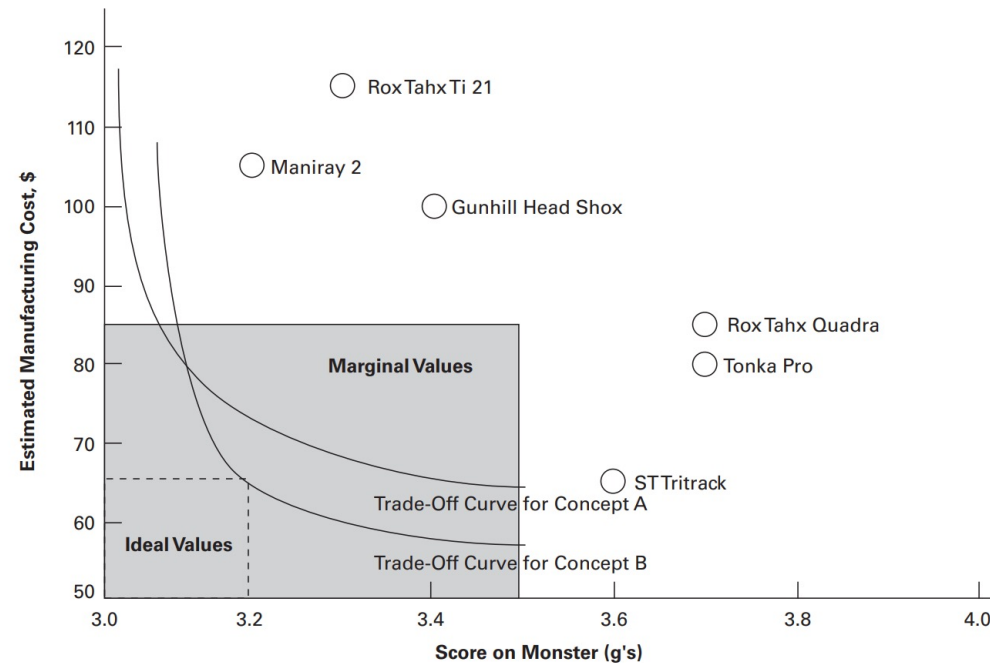
Component	Qty / Backpack	High (€ ea.)	Low (€ ea.)	High total (€/backpack)	Low total (€/backpack)
Zipper	1	3.00	0.75	3.00	0.75
Buckle	2	2.50	0.50	5.00	1.00
Strap stuffing	2	1.50	0.50	3.00	1.00
Total				11.00	2.75

Estimate manufacturing and assembly costs as well.



Refining specs, and trade-offs

Tools: Competitive map, conjoint analysis





Flow down of specs

Challenges:

Some specs are hard to allocate because of no obvious connection

Budget allocations

- Flowing down specs to subsystems



Reflect

- **Is the product a winner?**
- **How much uncertainty is there in the technical and cost models?**
- **Is the concept chosen by the team best suited to the target market, or could it be best applied in another market?**
- **Should the firm initiate a formal effort to develop better technical models of some aspect of the product's performance for future use?**

Key points of the subject

Product Specifications

- Transforming subjective customer needs to **concrete and precise targets**
- Guidance on how to design and engineer the product → **metric and a value**
- Participation of versatile teams to gain **holistic knowledge on different essential subjects**

Target specifications

- Preliminary goals for the development
1. Compile list of metrics
 2. Collect benchmarking information
 3. Set target values (ideals and marginally acceptable)
 4. Reflect and iterate



Final specifications

- Refined and more precise
1. Develop and explore technical models
 2. Develop cost models
 3. Refine and trade-off
 4. Flow down when needed
 5. Reflect

Exercise: Water purifier



Exercise – turning needs to metrics

METRICS		Oxygen Dissolved	Turbidity	Total Dissolve Solid	Reverse Osmosis	Dimension (WxDxH)	Total Weight of Purifier	Maintenance Cost	Electricity Consumption	Storage Capacity	Impact Strength	Unit Manufacturing cost	Flow Rate
NEED		1	2	3	4	5	6	7	8	9	10	11	12
1	Good Taste	*		*									
2	Clean Water		*	*	*								
3	Bacteria free				*								
4	Easy to install					*	*						
5	Cost Effective							*	*			*	
6	Chemical Free				*								
7	High Storage Capacity									*			
8	Have robust body										*		
9	Less weight						*						
10	Fast Purification												*
11	Smaller Size					*							
12	Portable					*	*						

Exercise

Competitive benchmarking chart based on metrics

Metric No.	Need no.	Metric	Imp.	Units	Our company	Competitor 1	Competitor 2
1	1	Oxygen Dissolved	5	ppm	6.4	7.1	8.3
2	2	Turbidity	4	NTU	4	5	3
3	1,2	Total Dissolve Solid	5	mg/l	400	645	500
4	2,3,6	Reverse Osmosis	4	Binary	yes	No	yes
5	4,11,12	Dimension (WxDxH)	3	m3	.0395	.0182	.0252
6	4,9,12	Total Weight of Purifier	3	Kg	8.3	4.7	8.5
7	5	Maintenance Cost	4	Rs	200	350	150
8	5	Electricity Consumption Rate	4	Watt	40	20	16
9	7	Storage Capacity	2	Litre	6	2	6
10	8	Impact Strength	1	KJ/ mm2	350	150	550
11	5	Unit Manufacturing Cost	4	Rs	14500/-	5488/-	12500/-
12	10	Flow Rate	4	Lt/min	2	1.5	1.75

Competitive benchmarking chart based on perceived satisfaction of needs

No.	NEED	IMP	Our company	Competitor 1	Competitor 2
1	Good Taste	5	***	****	*****
2	Clean Water	4	****	**	*****
3	Bacteria free	5	*****	***	*****
4	Easy to install	3	**	*****	***
5	Cost Effective	4	**	*****	***
6	Chemical Free	4	****	***	*****
7	High Storage Capacity	2	*****	*	*****
8	Have robust body	1	****	**	*****
9	Less weight	3	****	*****	***
10	Fast Purification	4	*****	***	****
11	Smaller Size	2	**	*****	****
12	Portable	3	**	*****	****

What could the final specifications look like?

Metric No.	Need no.	Metric	Imp.	Units	Value
1	1	Oxygen Dissolved	5	ppm	>7
2	2	Turbidity	4	NTU	<4
3	1,2	Total Dissolve Solid	5	mg/l	<350
4	2,3,6	Reverse Osmosis	4	Binary	_
5	4,11,12	Dimension (WxDxH)	3	m3	<0.0345
6	4,9,12	Total Weight of Purifier	3	Kg	<7
7	5	Maintenance Cost	4	Rs	<190/-
8	5	Electricity Consumption Rate	4	Watt	<35
9	5	Storage Capacity	2	Litre	>6
10	7	Impact Strength	1	KJ/ m2	>350
11	8	Unit Manufacturing Cost	4	Rs	<14000/-
12	10	Flow Rate	4	Lt/min	>2

Key tools for product specifications

1

Needs-metrics matrix to link customer needs to measurable characteristics

2

Competitive benchmarking chart to evaluate commercial success

3

Technical models to evaluate technical feasibility

4

Cost estimations to ensure profitability and meeting target costs

5

Competitive maps to assess trade-offs and favorable positions on market