think-cell Software GmbH

the smarter way to presentations

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Chart Creation in Business Consultancies

A quantitative study on software efficiency

Technical Report TC2003/02
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The efficiency in creating and altering charts can be improved by factor three to four compared to the current best practice in top-tier business consultancies.

Motivation

Business consultancies spend a large share of their resources on client communication. Most leading consultancies employ specialists to translate their consultants' findings and recommendations into convincing client deliverables. These specialists have gained years of experience and developed a best practice building upon the industry standard Microsoft PowerPoint. Still, our own personal experience in a consulting firm and anecdotal evidence from other consultants and graphics experts indicated a large potential for improving slide creation efficiency.

Starting from these indications, we spent half a year conducting interviews and observing work flows to thoroughly understand the problem. We then used test scenarios to quantify our qualitative impression. We strongly focused on software efficiency. We cooperated with one of the top-tier strategy consulting firms and they allowed us to publish this data anonymously. This report contains the results of our study.

Identification of improvement potentials

Exhibit 1.1 shows the distribution of graphics expert working time at one of our customers sites. 11 percent are dedicated to slide-specific drawings. A further 26 percent are spent on typing text on the slide. Both fractions offer only limited potential for improvement. Typing speed is limited by the keyboard skills of the user, while creating drawings is difficult to standardize using intelligent software.

22 percent are spent on the production of business charts from numerical data. By far the largest fraction is spent on arranging text, drawings and charts to create the final slide layout (41 percent). Both chart and layout times exclude typing of text. Including text-typing times, 30 percent of the working time is spent on charts and 59 percent on non-numerical standard slide components, excluding drawings. Both producing charts and slide layouts has a high potential for improvement, because charts and slide layouts are usually standardized within a consultancy and bound by common design rules, which can be formalized into a computer program.

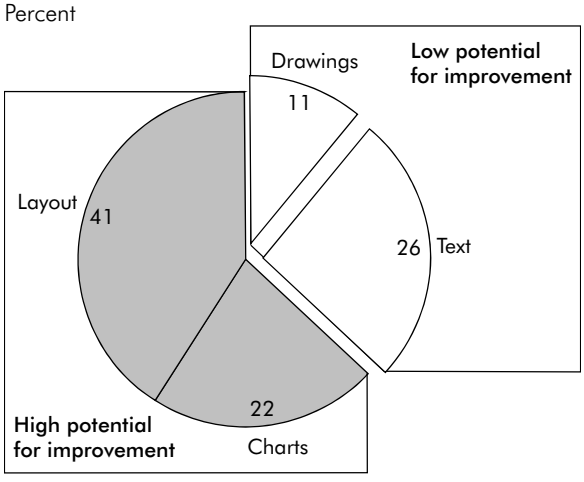
We focus the rest of this study on the impact of using the software think-cell chart that was designed to exploit the described efficiency gain potential in chart production. As a first step we took a closer look at the types of charts used by consultancies. Exhibit 1.2 shows that only a few chart types account for a large fraction of all used charts in the cooperating consultancy. We compared this result with results obtained from other consultancies, and found it to hold everywhere, with the dominating chart types varying slightly across different firms.

Test setup

To quantify the impact of new software on the creation and alteration of charts, we selected

Exhibit 1.1

63 percent of all production work has high potential for improvement by new software*

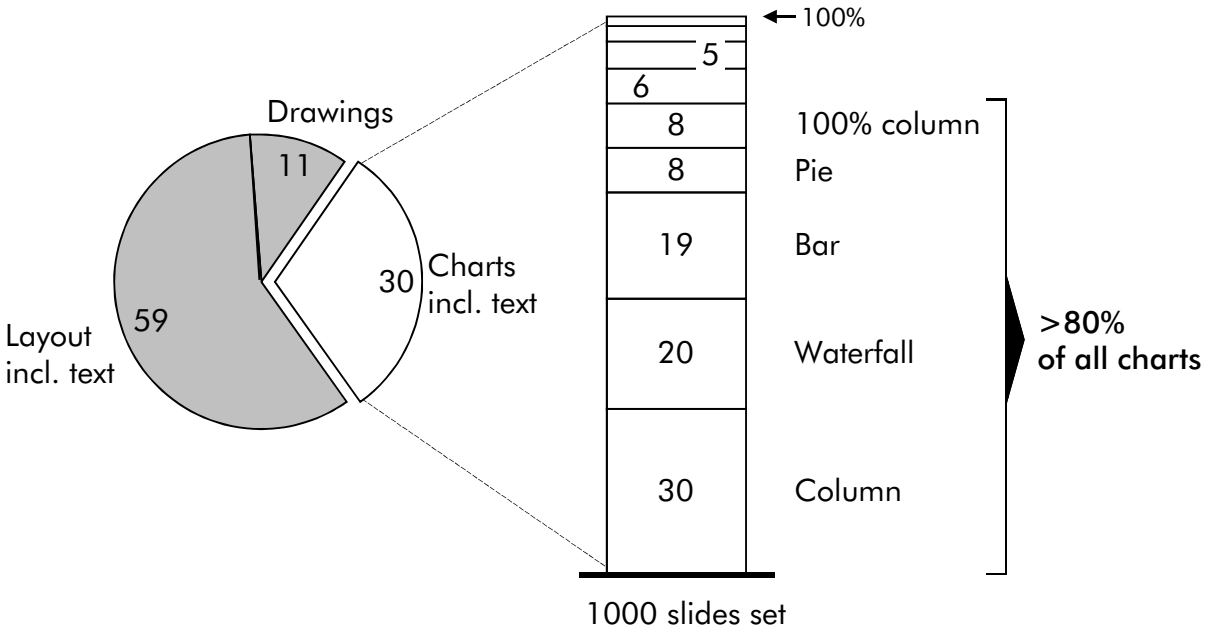


*Source: Research study by Free University Berlin, 2002.

Exhibit 1.2

A small number of chart types accounts for almost all chart work*

Percent



*Source: Research study by Free University Berlin, 2002.

a set of 48 typical charts out of a portfolio of archived slides. You can find them attached to this report. (They have been edited for anonymity.) Exhibit 1.3 illustrates that the mixture of chart types in the test set resembles the mixture obtained by analyzing a much larger slide set. Our cooperation partner counted the number of different chart types in a set of one thousand slides picked randomly from its portfolio. 468 of these slides had a chart.

We created two scenarios from the test set. The first scenario simulated the typical creation process: A chart is sketched by a consultant, faxed to the graphics expert and turned into PowerPoint. In our test, a highly experienced graphics expert from our cooperation partner turned the sketches into PowerPoint slides. He was allowed to use the firm regular set of templates for typical chart types and quantities (4-column, 5-column, . . .) and also the macros already in use (for legends, unit of measure and so on). We took the time required to create the charts.

For the second scenario we printed the slides created in the first scenario, annotated them with typical changes a consultant would make, and handed them back to the graphics expert. We again took the time to incorporate the changes into the slides.

Exhibit 1.3

The chart mix of the test set is representative

Percent

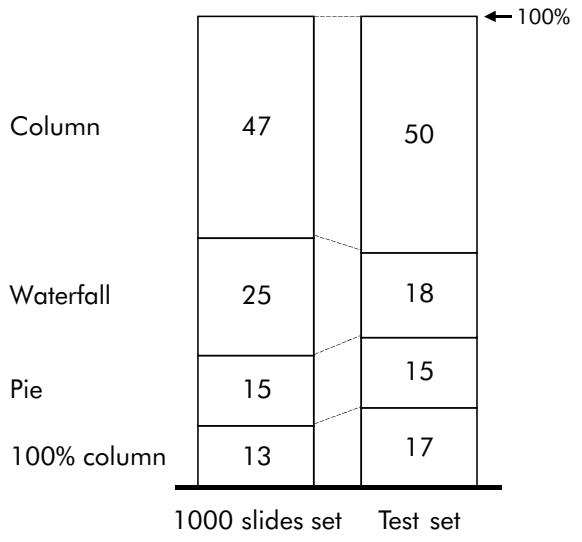
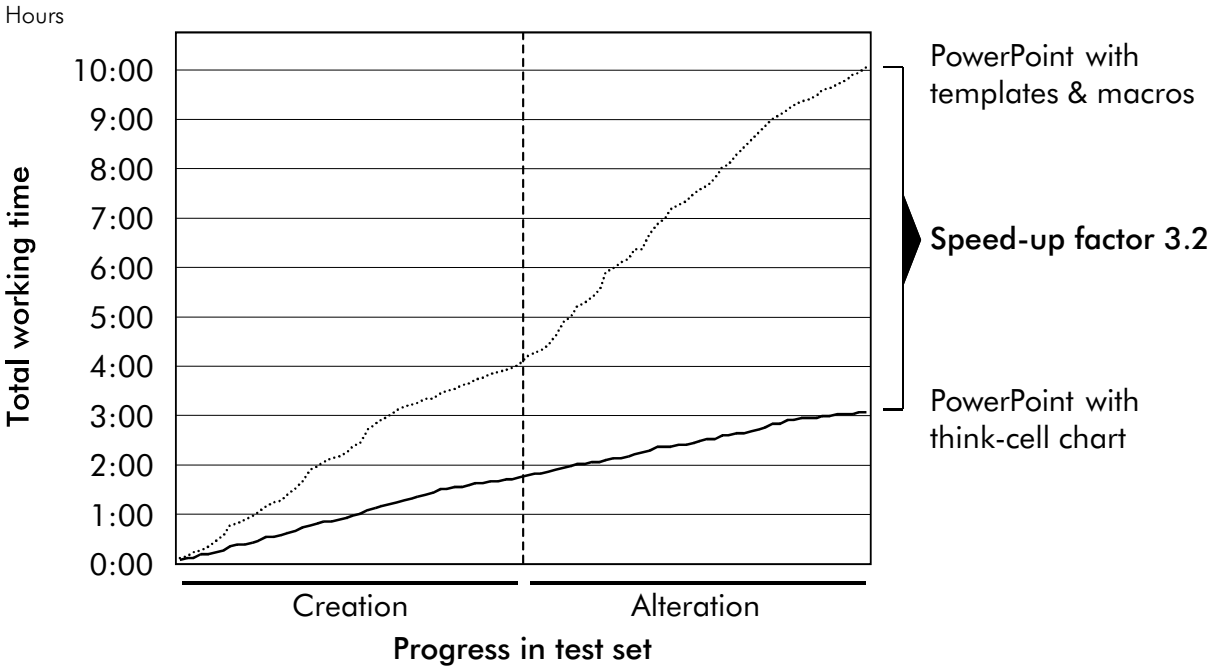


Exhibit 1.4

Using think-cell chart total working time is cut substantially



The same two scenarios were used to evaluate the efficiency of the PowerPoint add-in think-cell chart.

Results

The tables with all the results can be found at the end of this report (Exhibits 1.7 and 1.8). The main finding is illustrated by exhibit 1.4. It shows the accumulated time for creating and changing the charts specified by our test set. At our cooperation partner, alteration accounts for approximately 60 percent of chart production time. Hence, we scaled the time for chart alteration by two. This resembles the common assumption that one creation cycle leads to at least two cycles of alteration.

The accumulated time for finishing the test set using PowerPoint together with templates and macros was over ten hours. The accumulated time for finishing the test set using PowerPoint with the think-cell chart add-in was approximately three hours. This implies an overall speed-up factor of 3.2. Exhibit 1.5 breaks this result down to the four chart types that were included in our test. All chart types benefit quite evenly from using think-cell chart, especially in the alteration scenario.

Exhibit 1.6 illustrates the speed-ups for each individual test chart. The variations of speed-ups are within the expected range, with no individual edit being slower with think-cell chart than with PowerPoint, and more complex charts, which take longer to create, benefiting more from think-cell chart than simpler ones.

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Exhibit 1.5

All chart types are sped up, especially alteration

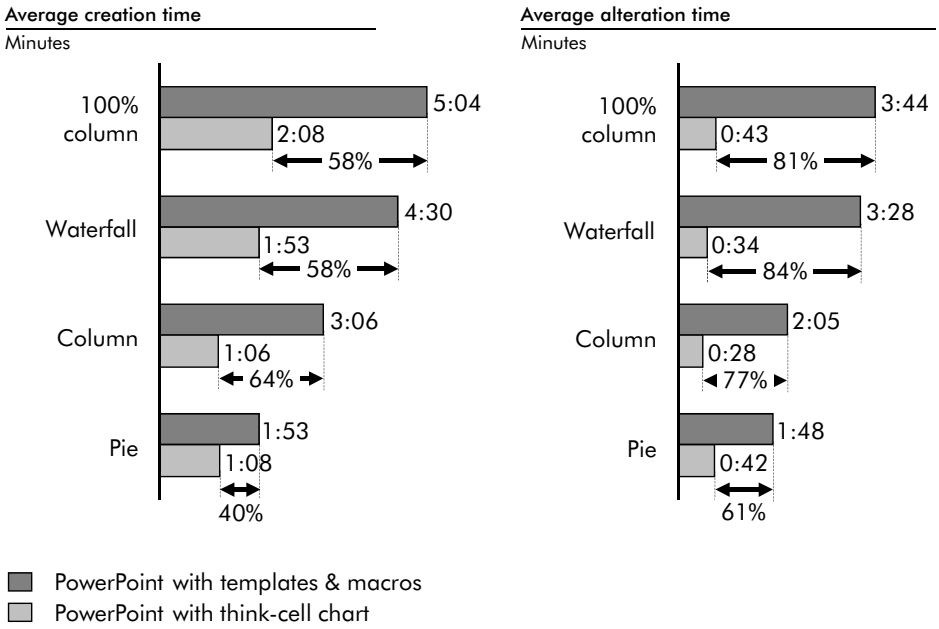


Exhibit 1.6

All chart instances are sped up

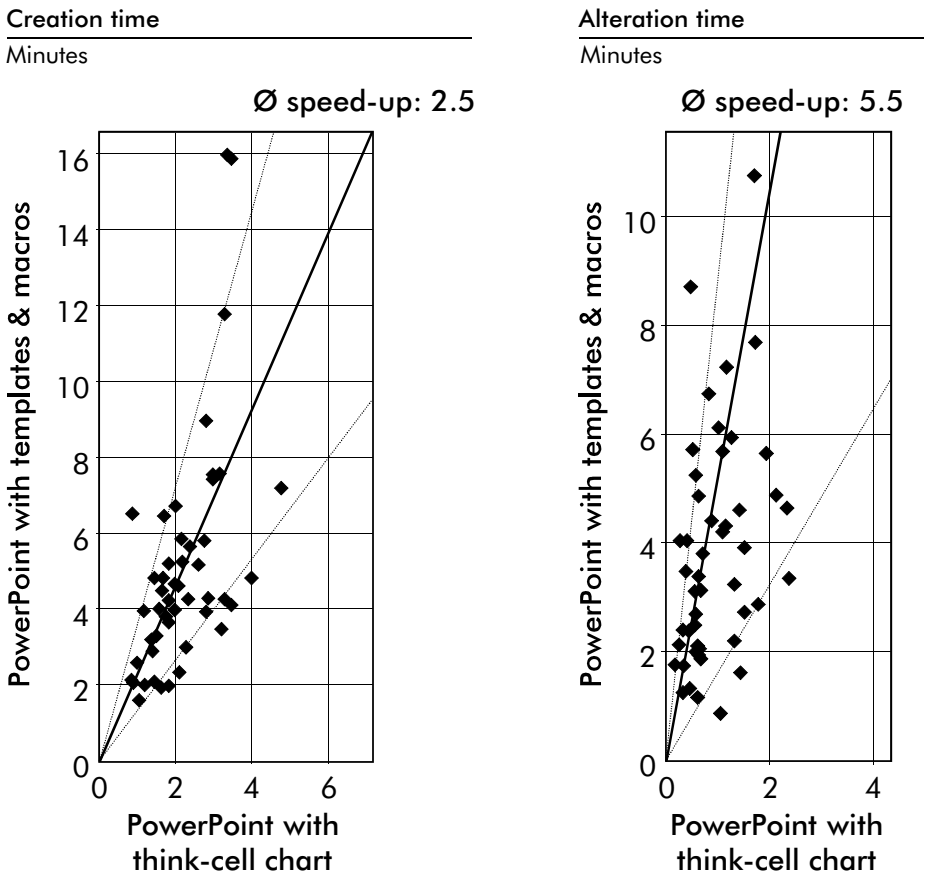


Exhibit 1.7

Results of customer graphics expert using PowerPoint together with macros and templates

Hour:Min:Sec

Slide	Creation time (per slide)	Change time (per slide)	Chart type number					Creation time (per type)				Change time (per type)			
			Col	100%	W F	Pie	Total	Col	100%	W F	Pie	Col	100%	W F	Pie
1	0:07:12	0:05:37			1	1	2			0:03:36	0:03:36			0:02:49	0:02:49
2	0:02:21	0:01:37				1	1				0:02:21				0:01:37
3	0:03:40	0:01:52			1		1			0:03:40				0:01:52	
4	0:03:29	0:03:20				1	1				0:03:29				0:03:20
5	0:05:15	0:05:40	1				1	0:05:15				0:05:40			
6	0:06:43	0:07:39	2				2	0:06:43				0:07:39			
7	0:05:51	0:04:11			1		1			0:05:51				0:04:11	
8	0:11:46	0:05:55	4				4	0:11:46				0:05:55			
9	0:03:13	0:02:24	1				1	0:03:13				0:02:24			
10	0:04:01	0:03:06	1				1	0:04:01				0:03:06			
11	0:04:49	0:04:18				1	1				0:04:49				0:04:18
12	0:04:07	0:10:42		1			1		0:04:07				0:10:42		
13	0:07:34	0:02:23			1		1			0:07:34				0:02:23	
14	0:03:59	0:03:07			1		1			0:03:59				0:03:07	
15	0:04:16	0:02:29			1		1			0:04:16				0:02:29	
16	0:04:50	0:05:42		1			1		0:04:50				0:05:42		
17	0:08:58	0:00:52		2			2		0:08:58				0:00:52		
18	0:07:26	0:08:40			1		1			0:07:26				0:08:40	
19	0:15:51	0:06:43		1			1		0:15:51				0:06:43		
20	0:03:48	0:03:22	1				1	0:03:48				0:03:22			
21	0:05:48	0:05:13		1		1	2		0:02:54		0:02:54		0:02:37		0:02:37
22	0:02:54	0:02:41	1				1	0:02:54				0:02:41			
23	0:03:56	0:02:06	2				2	0:03:56				0:02:06			
24	0:04:16	0:04:35				2	2				0:04:16				0:04:35
25	0:05:39	0:02:52	2				2	0:05:39				0:02:52			
26	0:05:12	0:02:12	2				2	0:05:12				0:02:12			
27	0:15:58	0:04:23	4				4	0:15:58				0:04:23			
28	0:07:33	0:07:12	3				3	0:07:33				0:07:12			
29	0:04:40	0:01:10	1				1	0:04:40				0:01:10			
30	0:04:37	0:06:06			1		1			0:04:37				0:06:06	
31	0:06:31	0:04:02			2		2			0:06:31				0:04:02	
32	0:04:50	0:04:51	1				1	0:04:50				0:04:51			
33	0:02:01	0:04:38				1	1				0:02:01				0:04:38
34	0:03:00	0:03:47		1			1		0:03:00				0:03:47		
35	0:04:18	0:04:52				8	8				0:04:18				0:04:52
36	0:01:56	0:01:44		1			1		0:01:56				0:01:44		
37	0:05:10	0:03:54		1		1	2		0:02:35		0:02:35		0:01:57		0:01:57
38	0:02:06	0:02:03				1	1				0:02:06				0:02:03
39	0:04:15	0:02:43	2				2	0:04:15				0:02:43			
40	0:03:19	0:01:20				1	1				0:03:19				0:01:20
41	0:01:59	0:02:00			1		1			0:01:59				0:02:00	
42	0:06:28	0:03:14		1			1		0:06:28				0:03:14		
43	0:02:09	0:01:46	1				1	0:02:09				0:01:46			
44	0:03:58	0:01:57	1				1	0:03:58				0:01:57			
45	0:01:37	0:02:07	1				1	0:01:37				0:02:07			
46	0:02:04	0:03:28	1				1	0:02:04				0:03:28			
47	0:02:36	0:01:15	1				1	0:02:36				0:01:15			
48	0:04:30	0:04:02			1		1			0:04:30				0:04:02	
Σ	4:02:29	3:01:52	33	10	12	19	74	1:42:07	0:50:39	0:53:59	0:35:44	1:08:49	0:37:17	0:41:41	0:34:05
Ø	0:05:03	0:03:47						0:03:06	0:05:04	0:04:30	0:01:53	0:02:05	0:03:44	0:03:28	0:01:48

Exhibit 1.8

Results of customer graphics expert using PowerPoint together with think-cell chart

Hour:Min:Sec

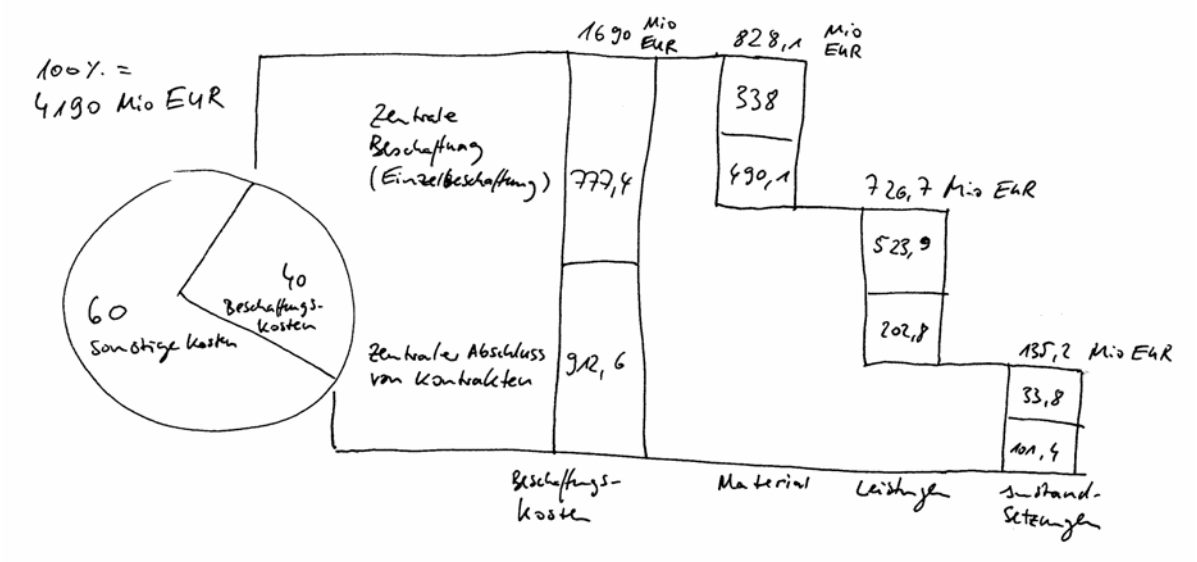
Slide	Creation time (per slide)	Change time (per slide)	Chart type number					Creation time (per type)				Change time (per type)			
			Col	100%	WF	Pie	Total	Col	100%	WF	Pie	Col	100%	WF	Pie
1	0:04:38	0:01:51			1	1	2			0:02:19	0:02:19			0:00:56	0:00:56
2	0:02:02	0:01:22				1	1				0:02:02				0:01:22
3	0:01:46	0:00:38			1		1			0:01:46				0:00:38	
4	0:03:07	0:02:16				1	1				0:03:07				0:02:16
5	0:02:07	0:01:02	1				1	0:02:07				0:01:02			
6	0:01:57	0:01:38	2				2	0:01:57				0:01:38			
7	0:02:06	0:01:02			1		1			0:02:06				0:01:02	
8	0:03:11	0:01:12	4				4	0:03:11				0:01:12			
9	0:01:20	0:00:19	1				1	0:01:20				0:00:19			
10	0:01:32	0:00:32	1				1	0:01:32				0:00:32			
11	0:01:25	0:01:06				1	1				0:01:25				0:01:06
12	0:03:22	0:01:37		1			1		0:03:22				0:01:37		
13	0:03:04	0:00:25			1		1			0:03:04				0:00:25	
14	0:01:56	0:00:38			1		1			0:01:56				0:00:38	
15	0:02:16	0:00:32			1		1			0:02:16				0:00:32	
16	0:03:52	0:00:29		1			1		0:03:52				0:00:29		
17	0:02:44	0:01:00		2			2		0:02:44				0:01:00		
18	0:02:53	0:00:27			1		1			0:02:53				0:00:27	
19	0:03:21	0:00:47		1			1		0:03:21				0:00:47		
20	0:01:42	0:00:36	1				1	0:01:42				0:00:36			
21	0:02:40	0:00:33		1		1	2		0:01:20		0:01:20		0:00:17		0:00:17
22	0:01:22	0:00:33	1				1	0:01:22				0:00:33			
23	0:02:43	0:00:35	2				2	0:02:43				0:00:35			
24	0:03:11	0:01:21				2	2				0:03:11				0:01:21
25	0:02:18	0:01:42	2				2	0:02:18				0:01:42			
26	0:01:47	0:01:15	2				2	0:01:47				0:01:15			
27	0:03:15	0:00:50	4				4	0:03:15				0:00:50			
28	0:02:53	0:01:07	3				3	0:02:53				0:01:07			
29	0:01:56	0:00:35	1				1	0:01:56				0:00:35			
30	0:02:01	0:00:58			1		1			0:02:01				0:00:58	
31	0:00:51	0:00:15			2		2			0:00:51				0:00:15	
32	0:01:38	0:00:36	1				1	0:01:38				0:00:36			
33	0:01:10	0:02:13				1	1				0:01:10				0:02:13
34	0:02:13	0:00:40		1			1		0:02:13				0:00:40		
35	0:02:46	0:02:01				8	8				0:02:46				0:02:01
36	0:01:35	0:00:20		1			1		0:01:35				0:00:20		
37	0:02:32	0:01:26		1		1	2		0:01:16		0:01:16		0:00:43		0:00:43
38	0:01:25	0:00:37				1	1				0:01:25				0:00:37
39	0:01:46	0:01:26	2				2	0:01:46				0:01:26			
40	0:01:28	0:00:26				1	1				0:01:28				0:00:26
41	0:01:47	0:00:33			1		1			0:01:47				0:00:33	
42	0:01:39	0:01:15		1			1		0:01:39				0:01:15		
43	0:00:50	0:00:10	1				1	0:00:50				0:00:10			
44	0:01:09	0:00:36	1				1	0:01:09				0:00:36			
45	0:01:01	0:00:14	1				1	0:01:01				0:00:14			
46	0:00:52	0:00:22	1				1	0:00:52				0:00:22			
47	0:00:58	0:00:19	1				1	0:00:58				0:00:19			
48	0:01:36	0:00:23			1		1			0:01:36				0:00:23	
Σ	1:41:43	0:42:50	33	10	12	19	74	0:36:17	0:21:22	0:22:35	0:21:29	0:15:39	0:07:07	0:06:46	0:13:17
Ø	0:02:07	0:00:54						0:01:06	0:02:08	0:01:53	0:01:08	0:00:28	0:00:43	0:00:34	0:00:42

Set of test slides

On the following pages you will find the 48 creation and alteration scenarios used for this study. PPT refers to the working time needed using PowerPoint together with macros and templates. TC refers to the working time needed using PowerPoint together with think-cell chart.

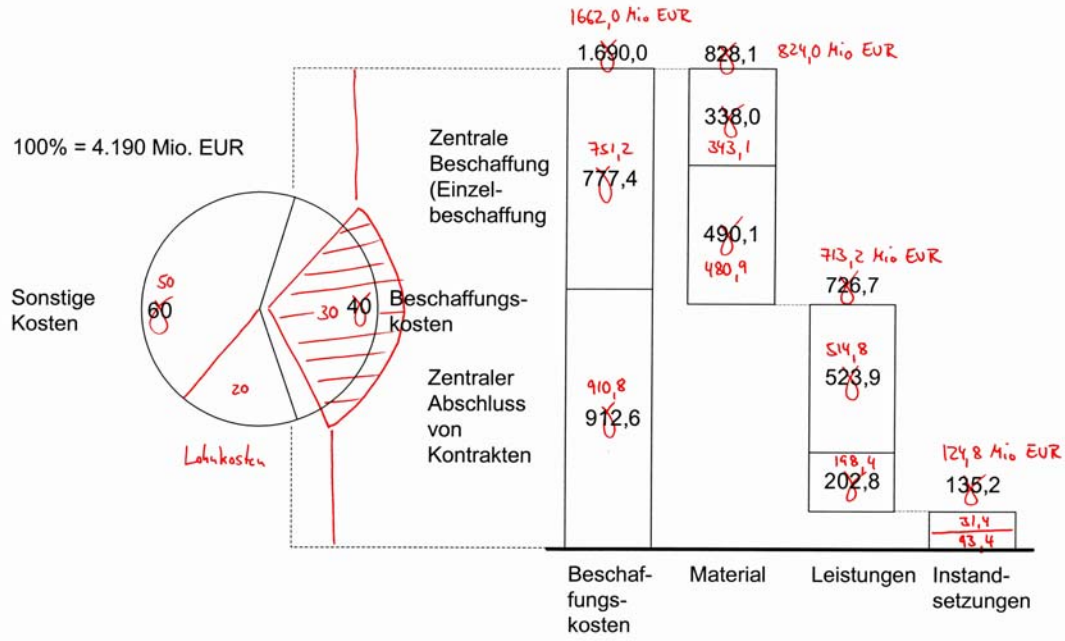
Creation 1

PPT 07:12
TC 04:38



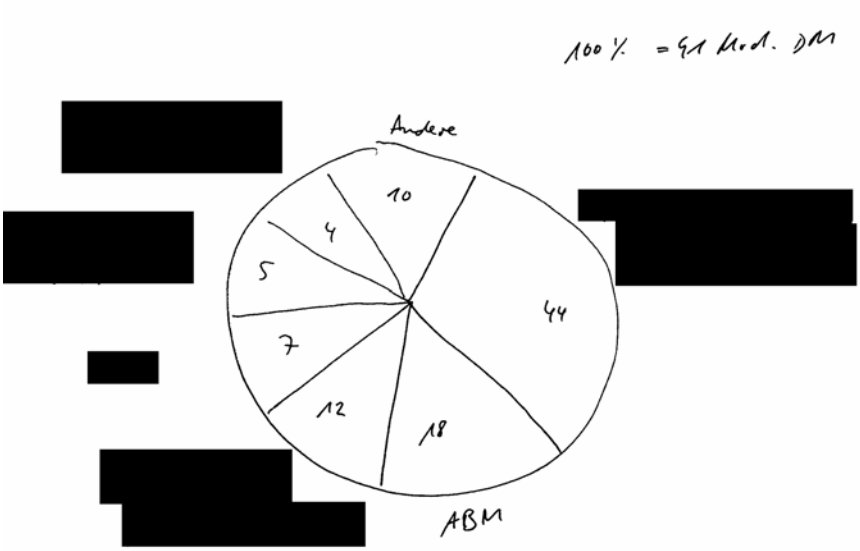
Alteration 1

PPT 05:37
TC 01:51



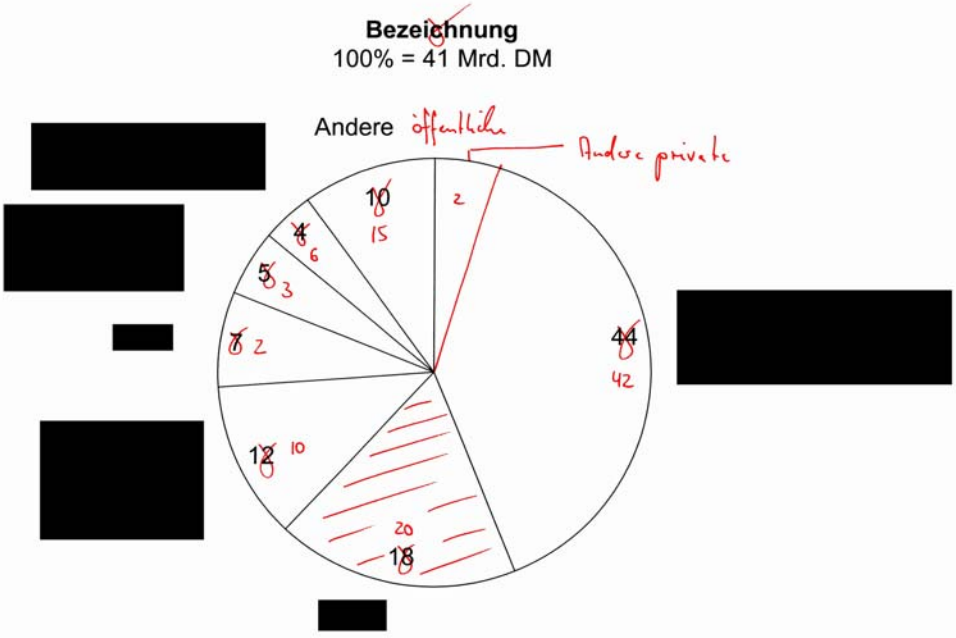
Creation 2

PPT 02:21
TC 02:02



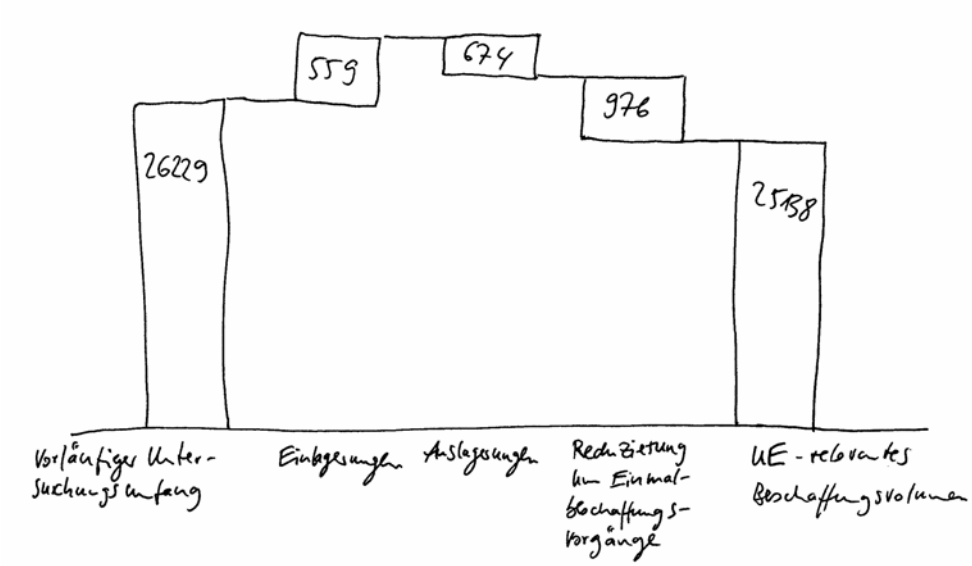
Alteration 2

PPT 01:37
TC 01:22



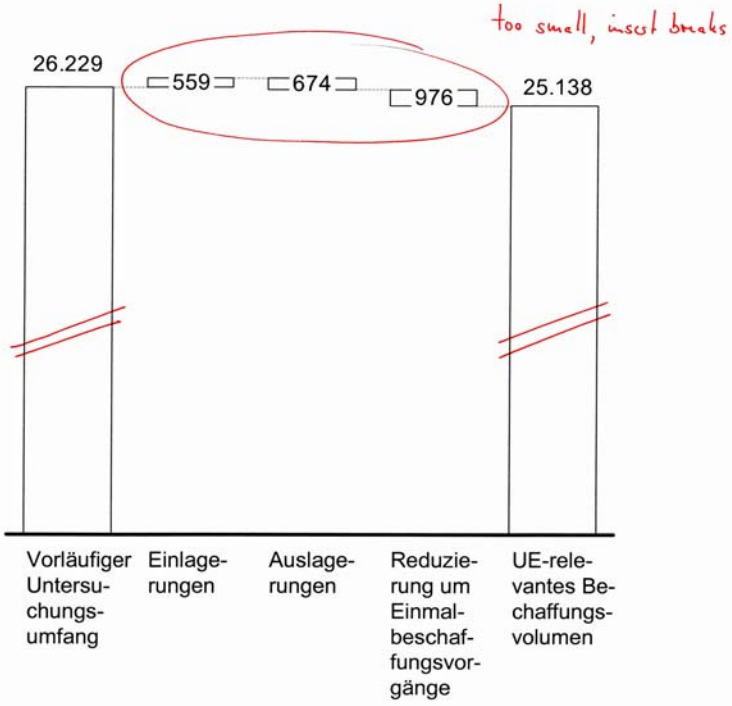
Creation 3

PPT 03:40
TC 01:46



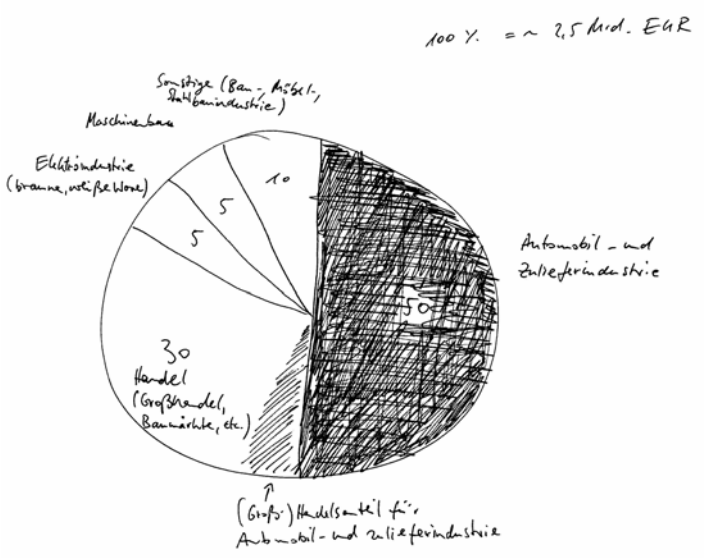
Alteration 3

PPT 01:52
TC 00:38



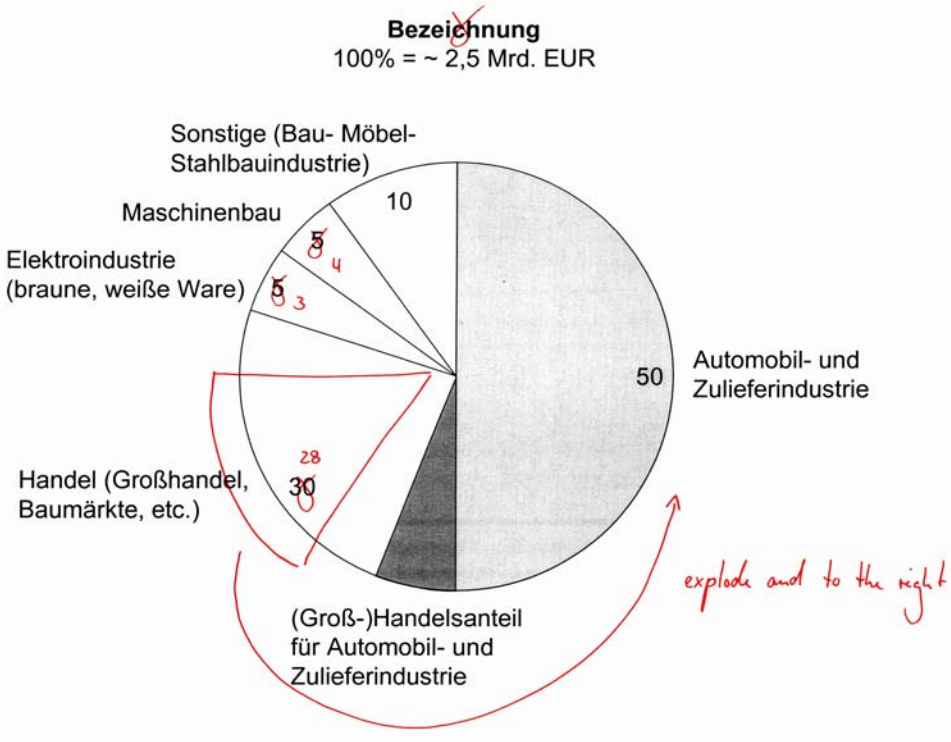
Creation 4

PPT 03:29
TC 03:07



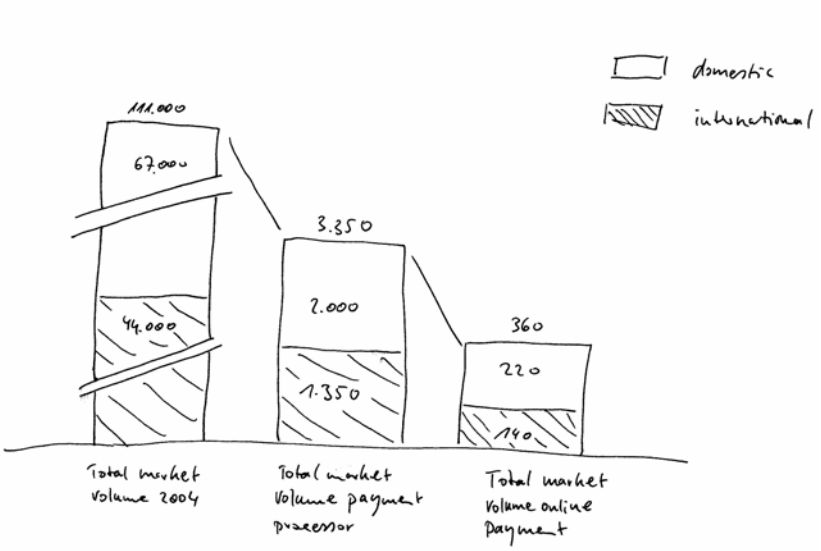
Alteration 4

PPT 03:20
TC 02:16



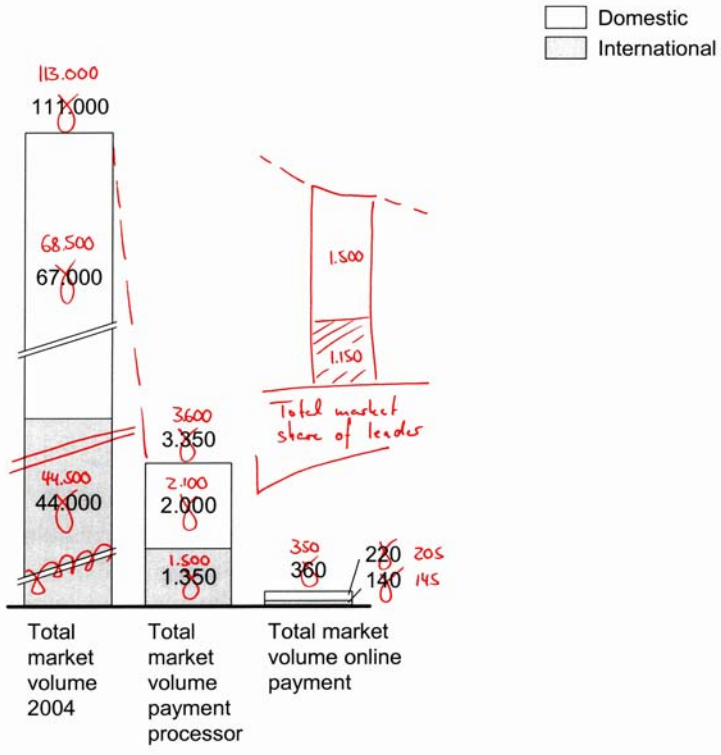
Creation 5

PPT 05:15
TC 02:07



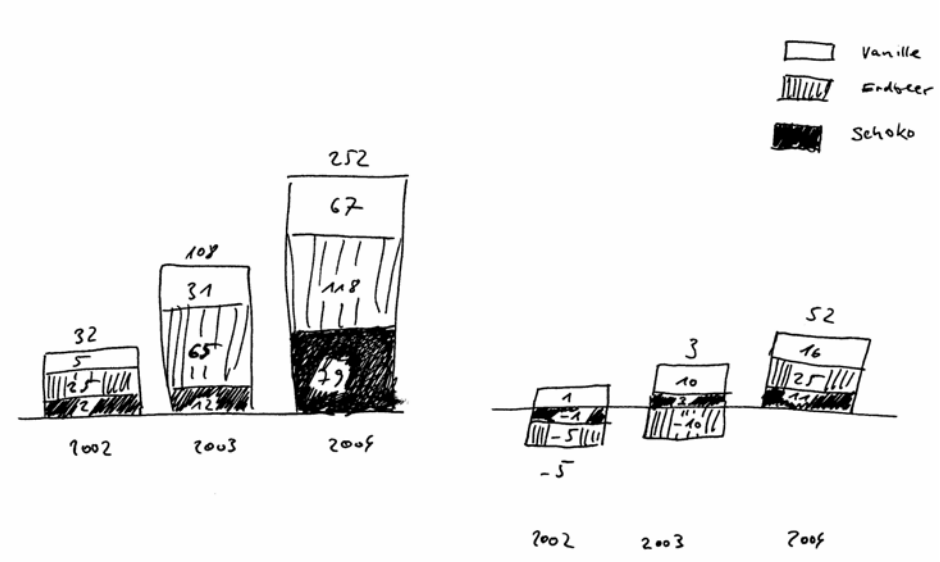
Alteration 5

PPT 05:40
TC 01:02



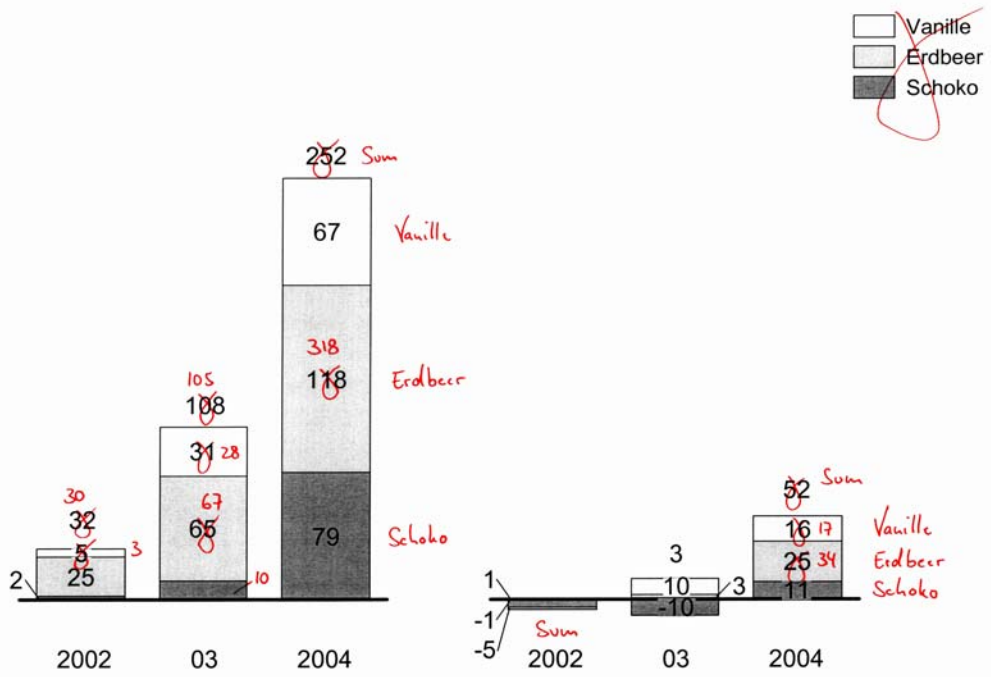
Creation 6

PPT 06:43
TC 01:57



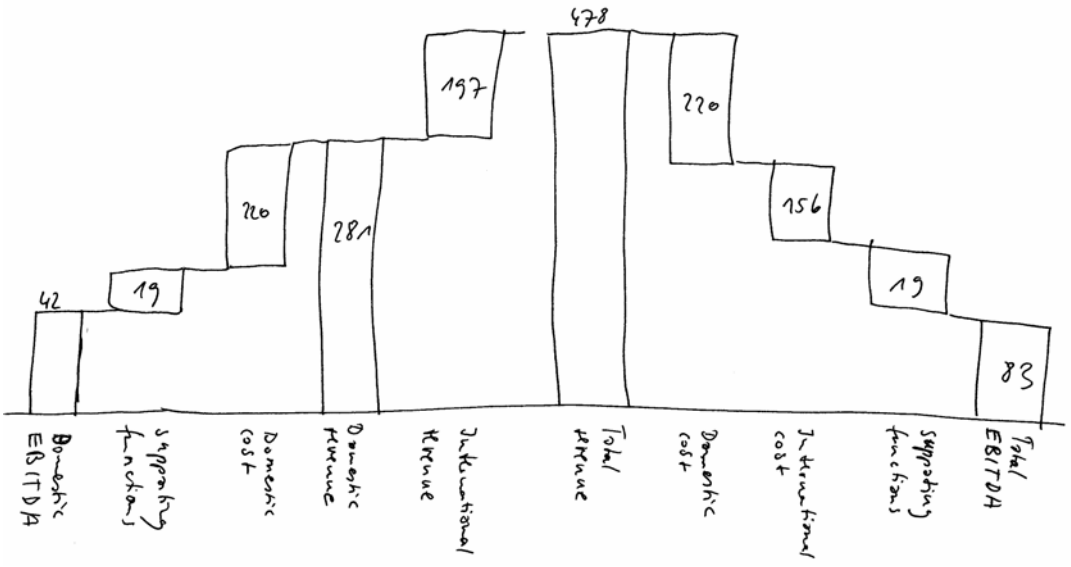
Alteration 6

PPT 07:39
TC 01:38



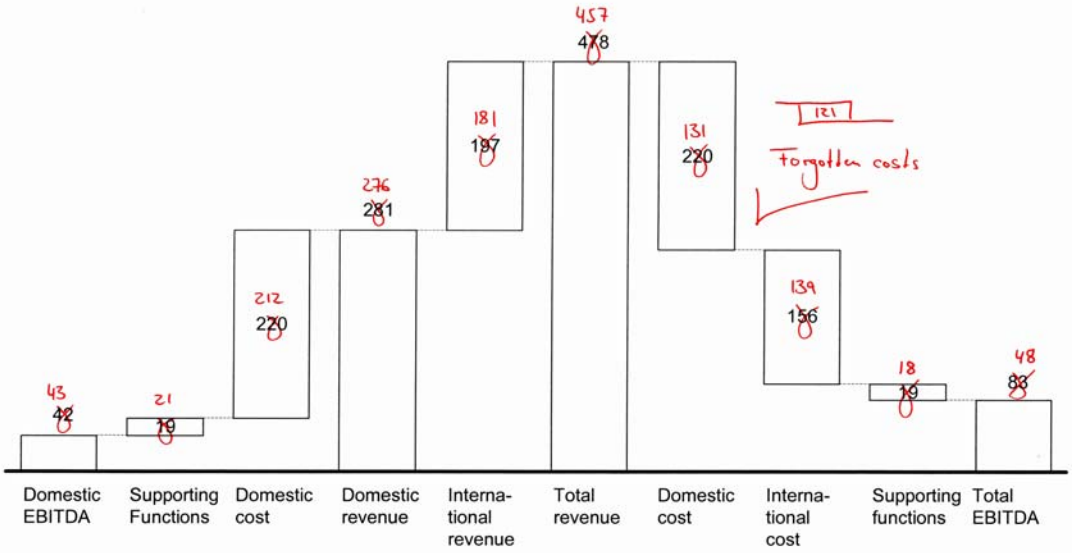
Creation 7

PPT 05:51
TC 02:06



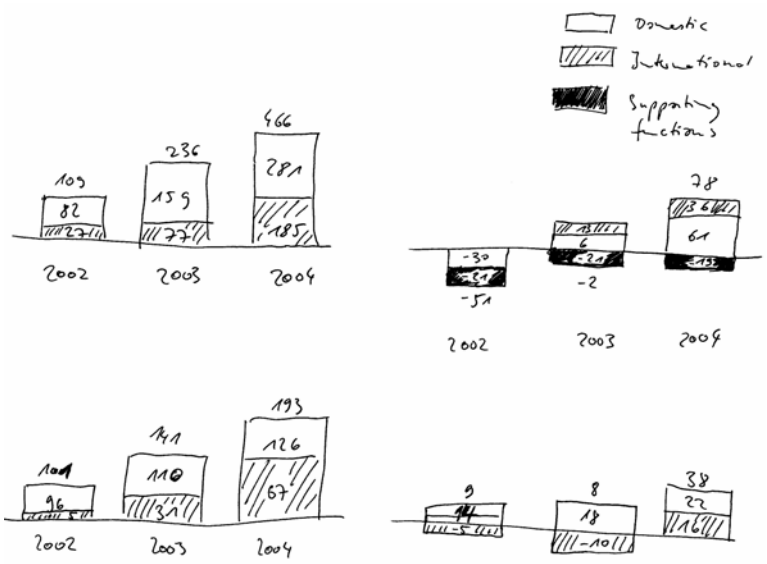
Alteration 7

PPT 04:11
TC 01:02



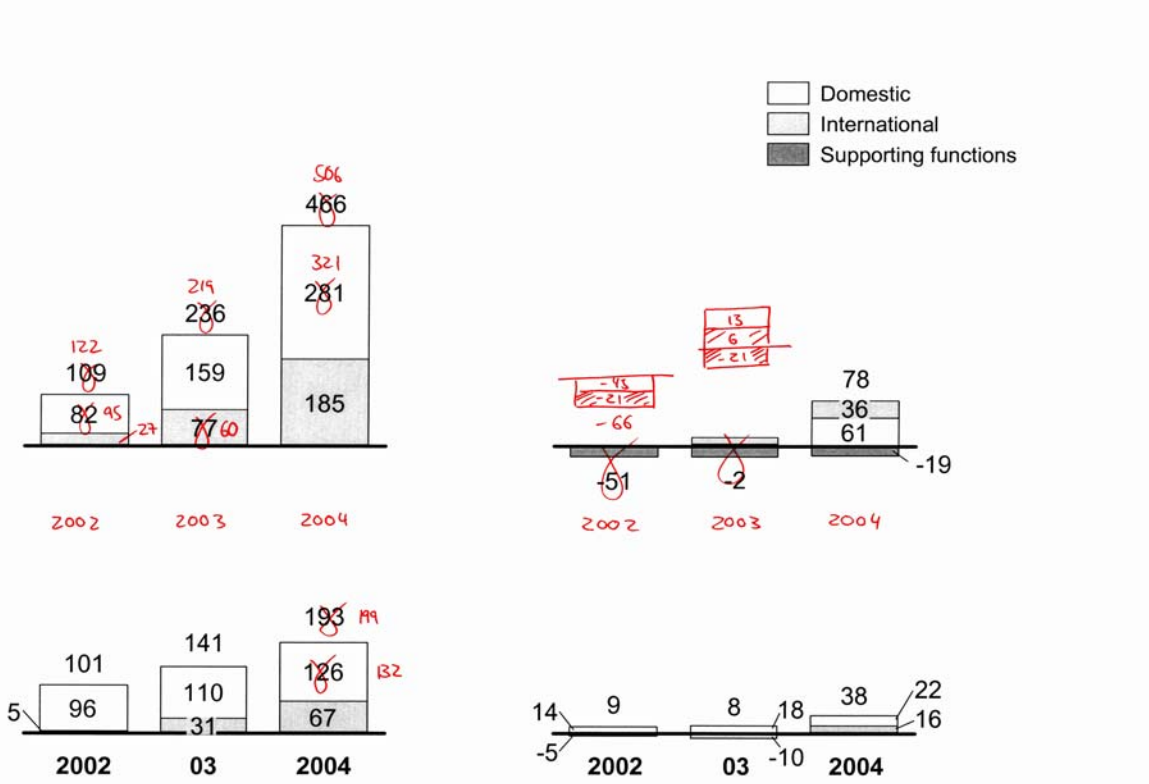
Creation 8

PPT 11:46
TC 03:11



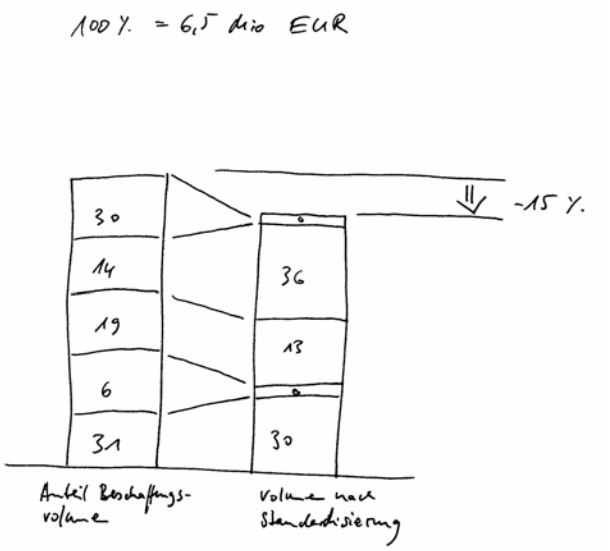
Alteration 8

PPT 05:55
TC 01:12



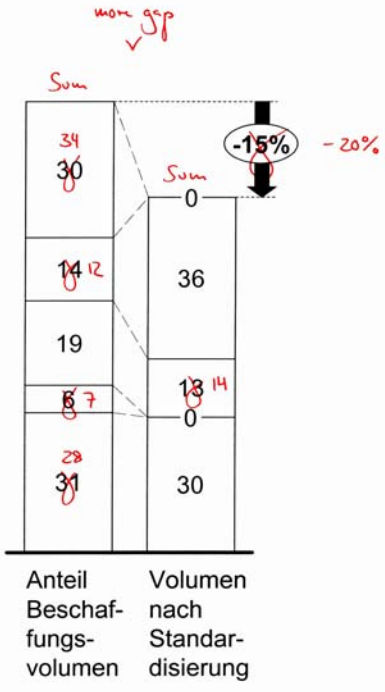
Creation 9

PPT 03:13
TC 01:20



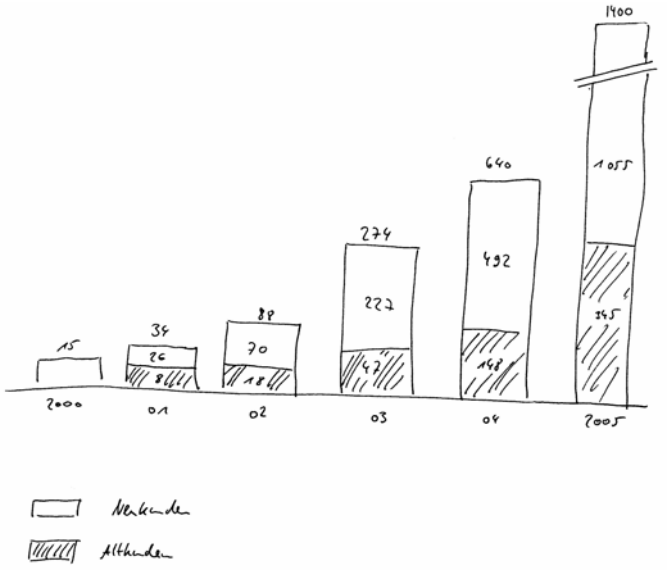
Alteration 9

PPT 02:24
TC 00:19



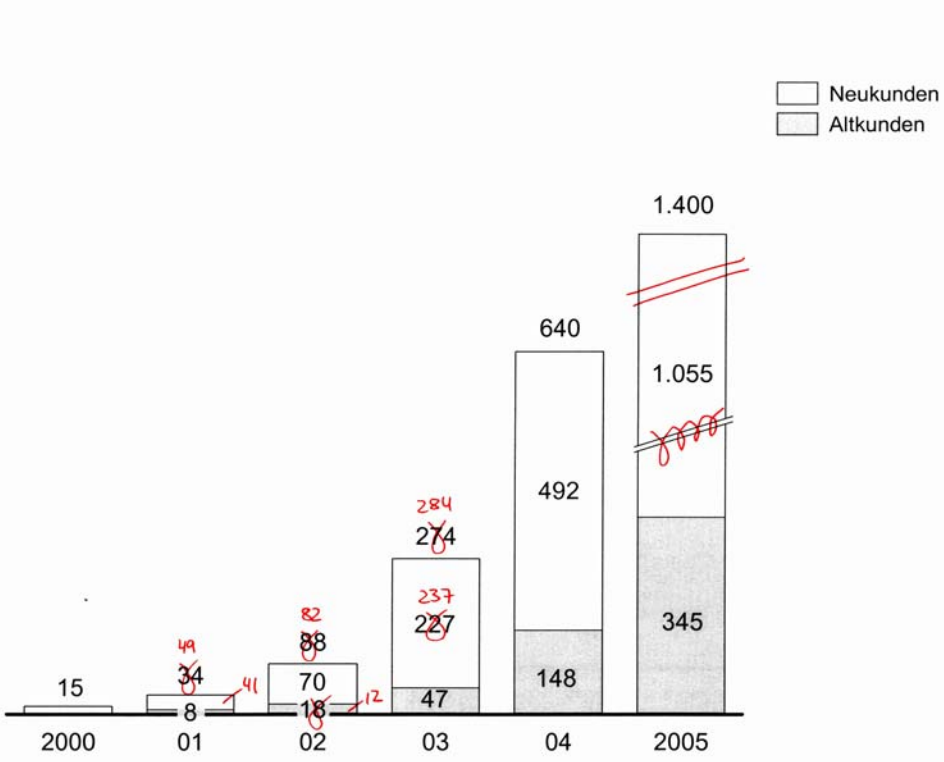
Creation 10

PPT 04:01
TC 01:32



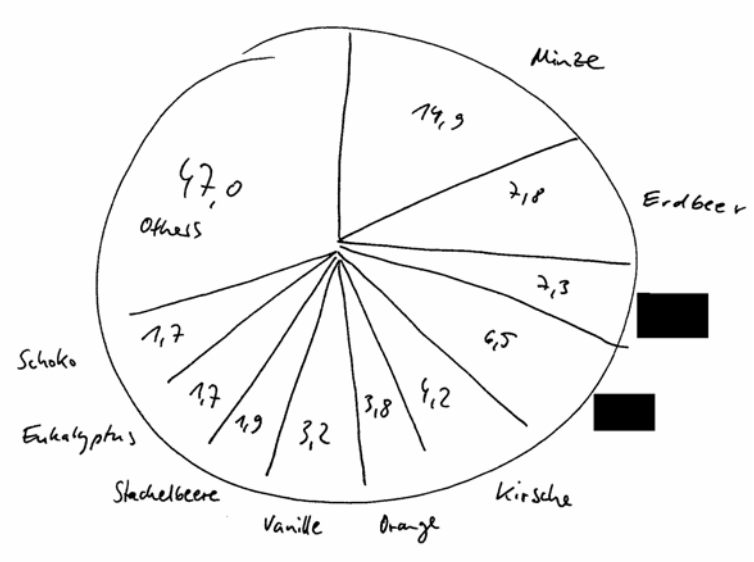
Alteration 10

PPT 03:06
TC 00:32



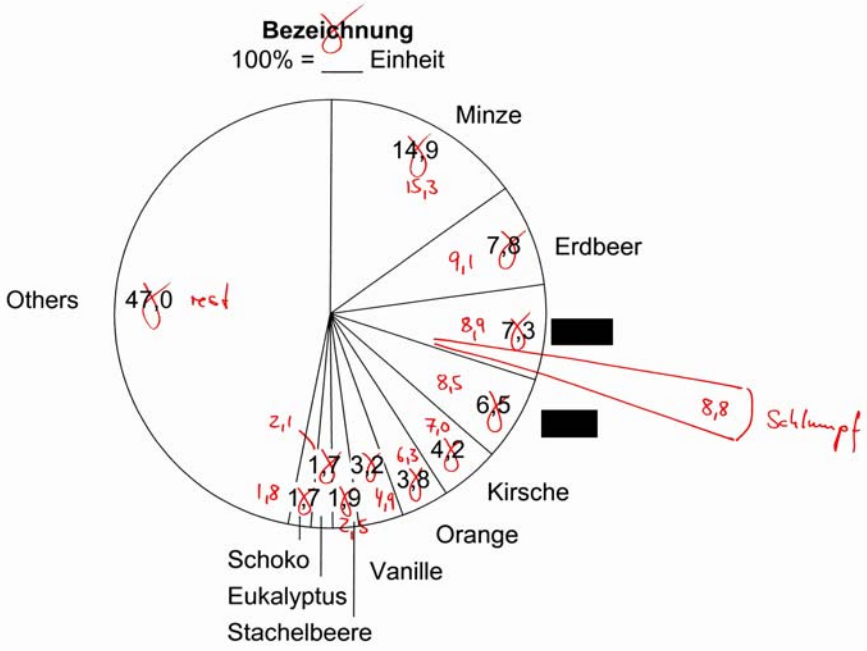
Creation 11

PPT 04:49
TC 01:25



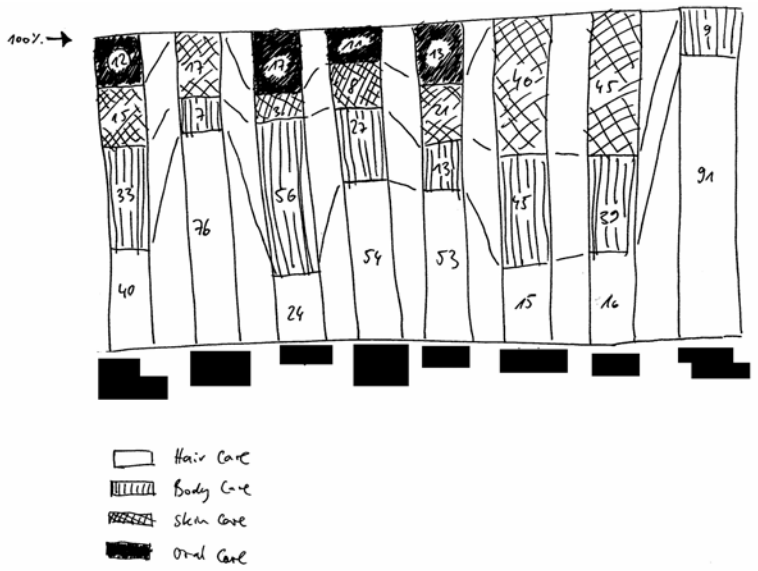
Alteration 11

PPT 04:18
TC 01:06



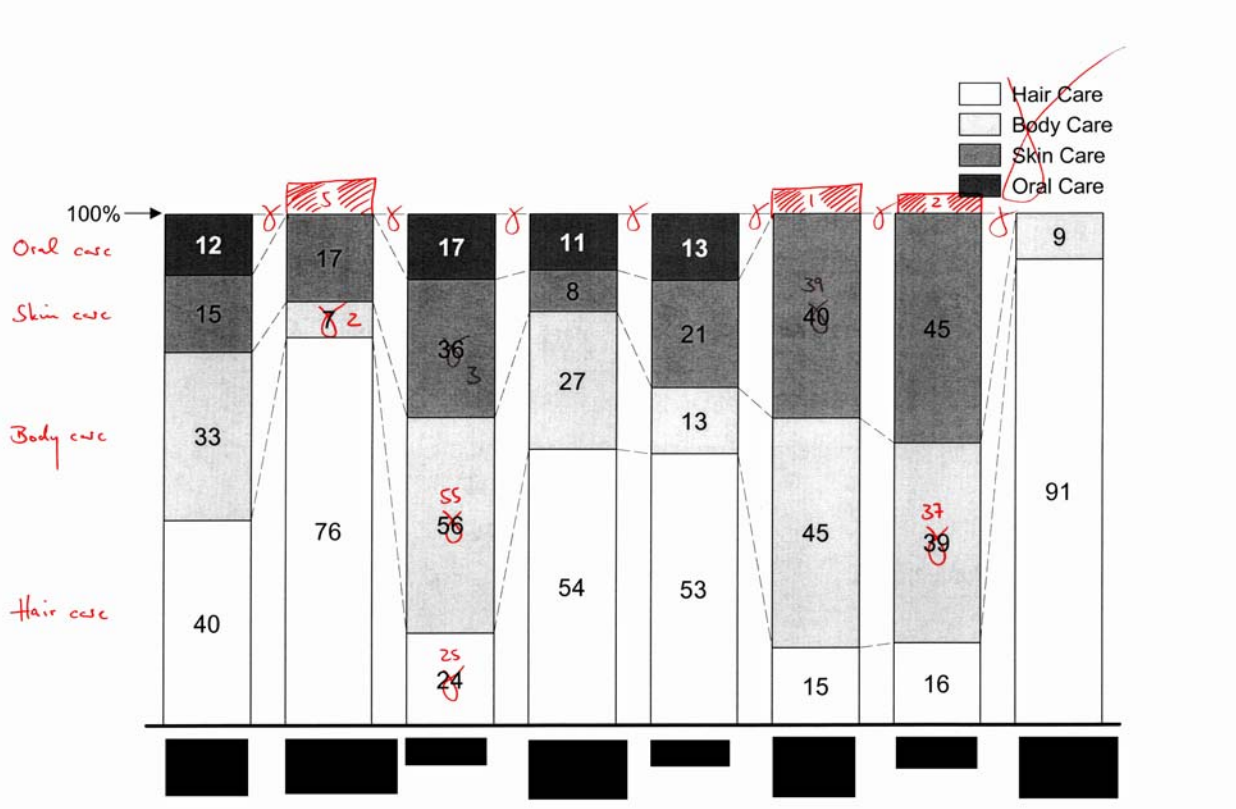
Creation 12

PPT 04:07
TC 03:22



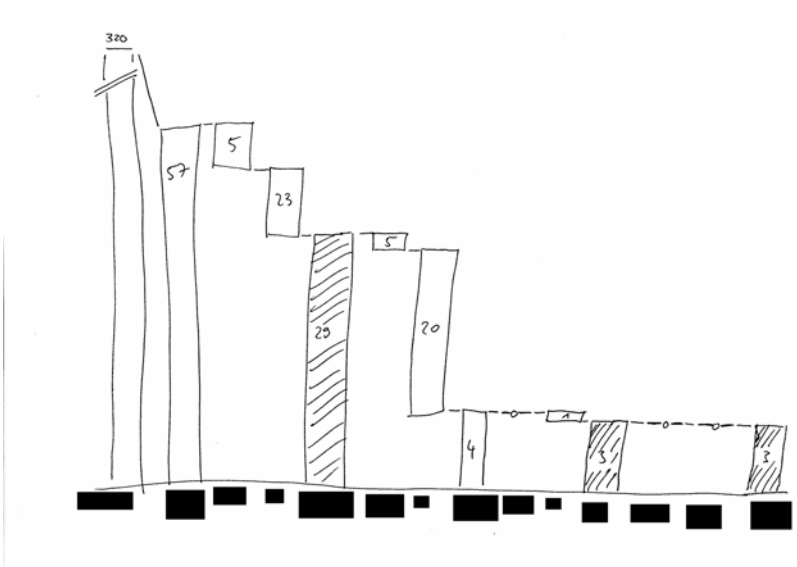
Alteration 12

PPT 10:42
TC 01:37



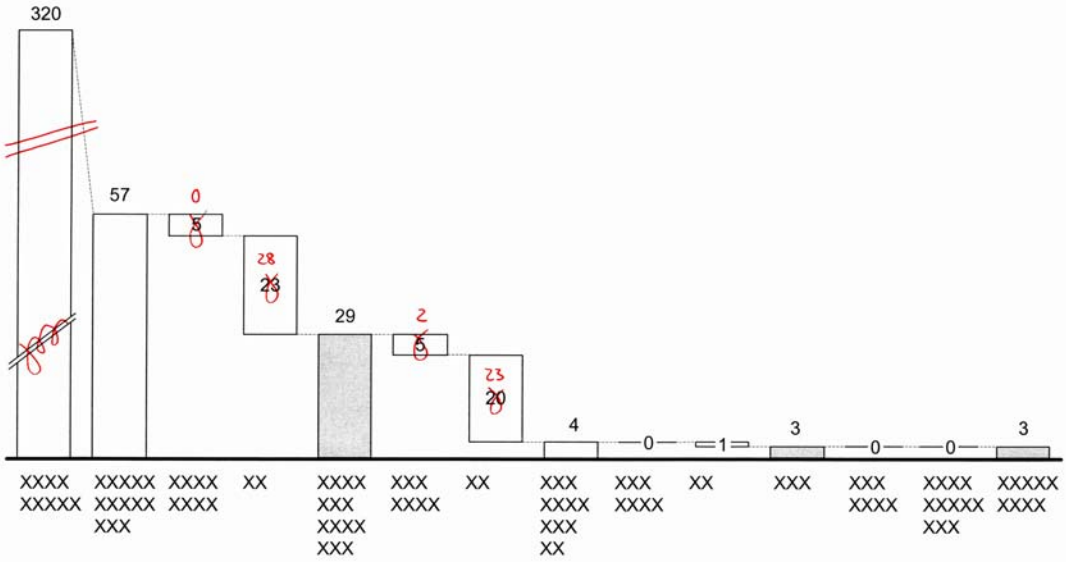
Creation 13

PPT 07:34
TC 03:04



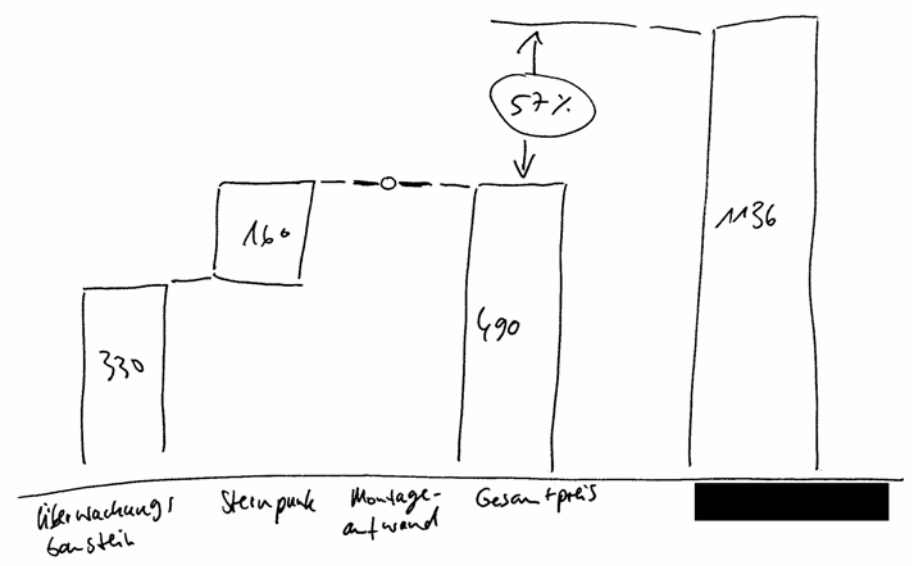
Alteration 13

PPT 02:23
TC 00:25



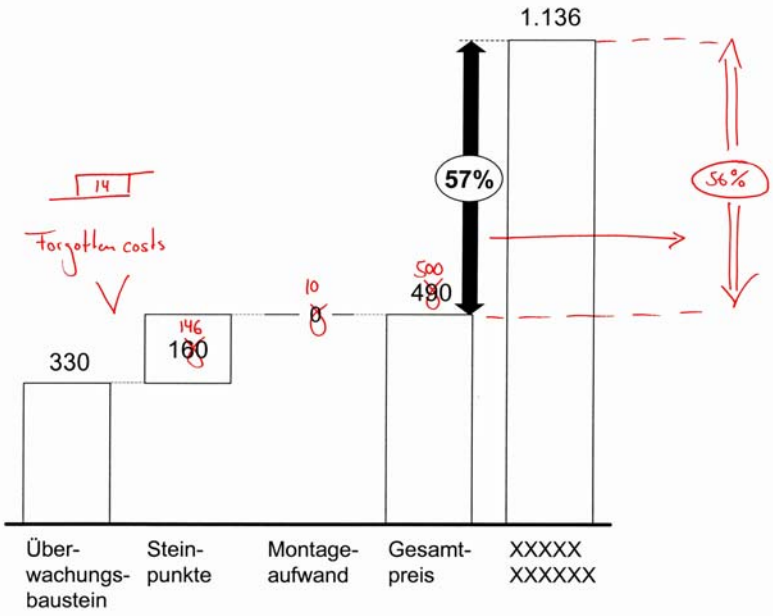
Creation 14

PPT 03:59
TC 01:56



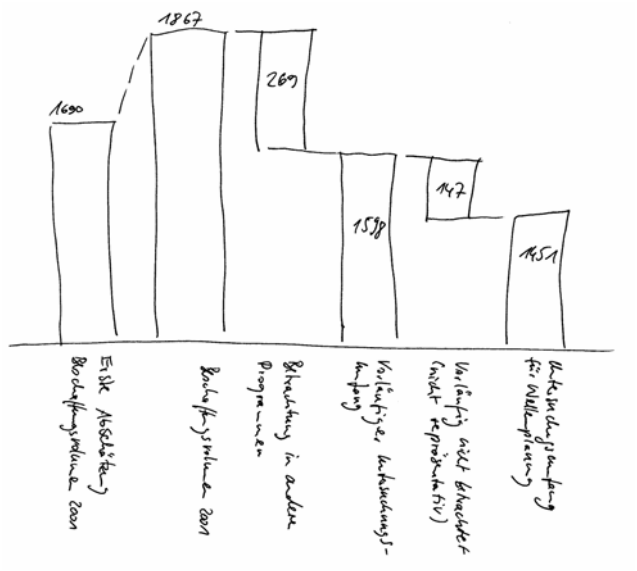
Alteration 14

PPT 03:07
TC 00:38



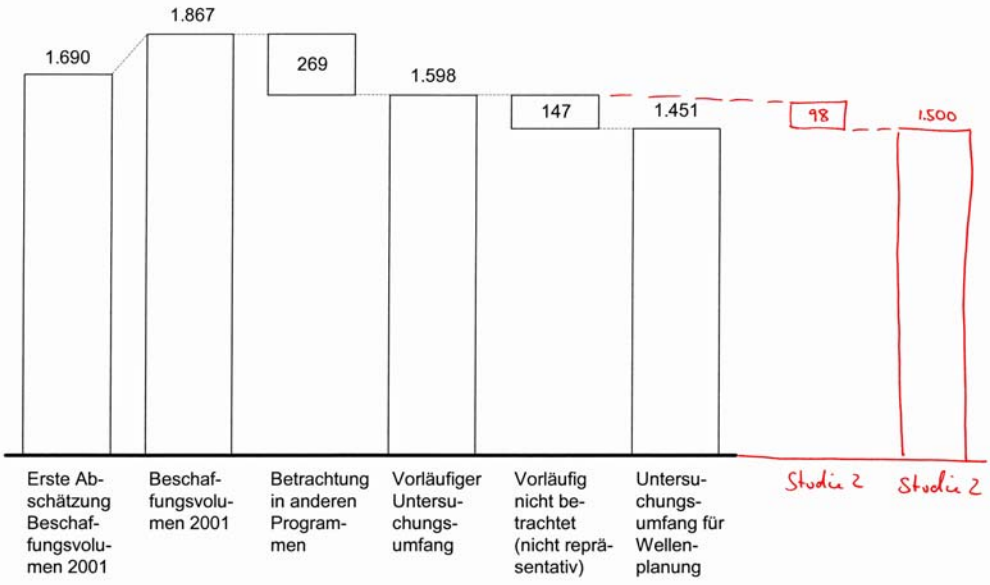
Creation 15

PPT 04:16
TC 02:16



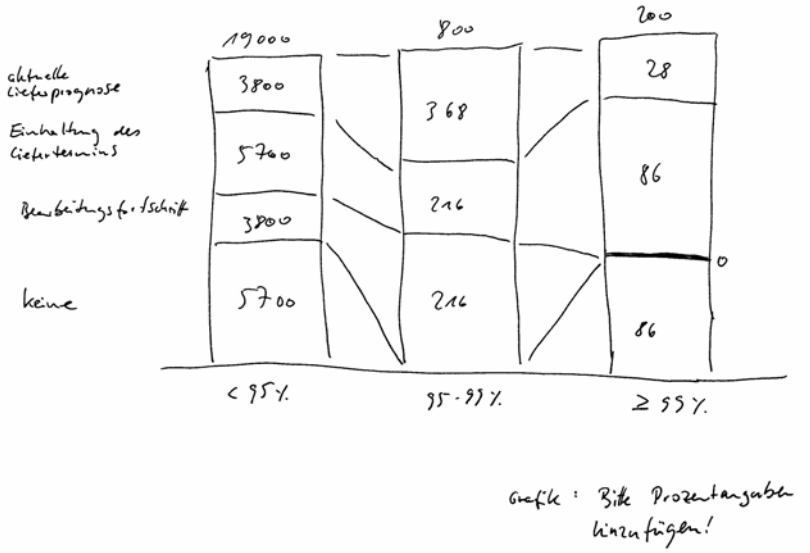
Alteration 15

PPT 02:29
TC 00:32



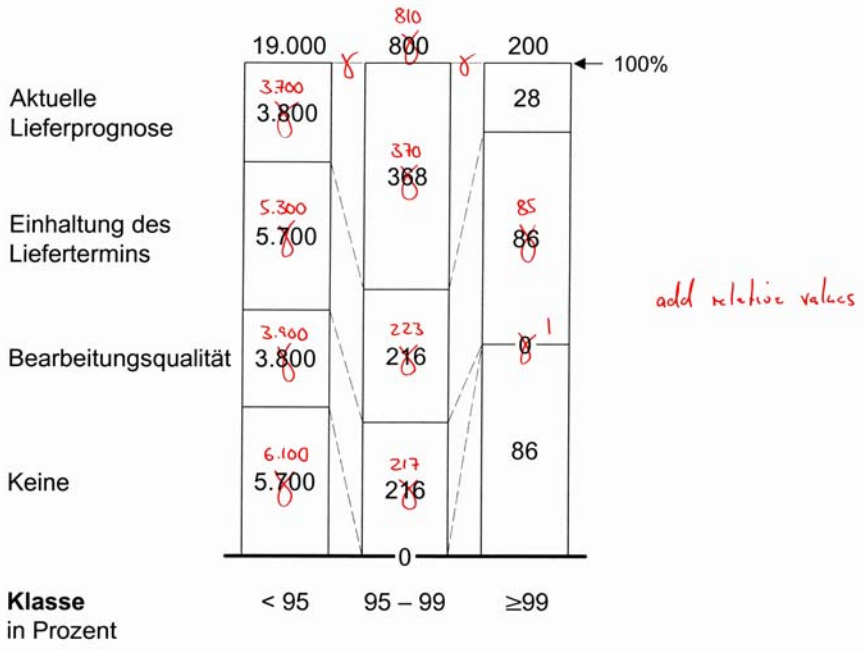
Creation 16

PPT 04:50
TC 03:52



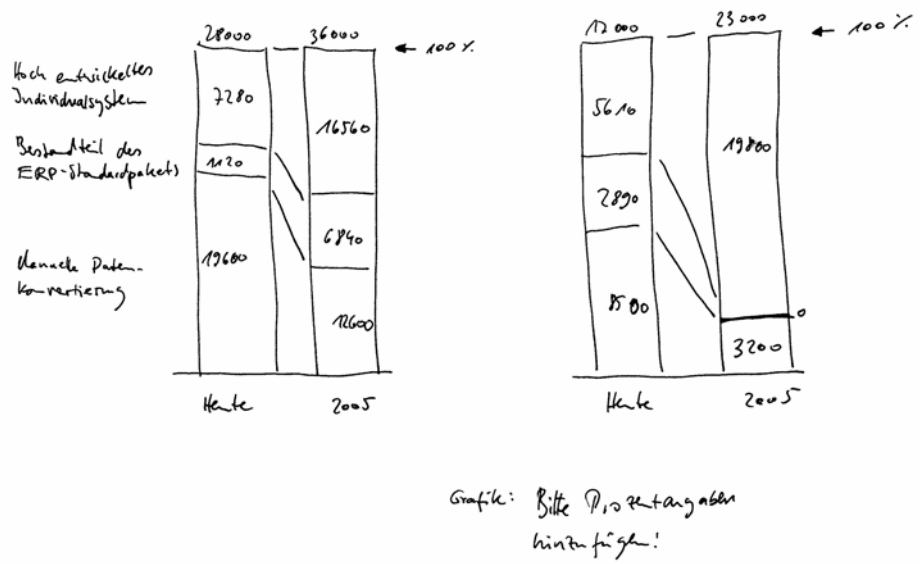
Alteration 16

PPT 05:42
TC 00:29



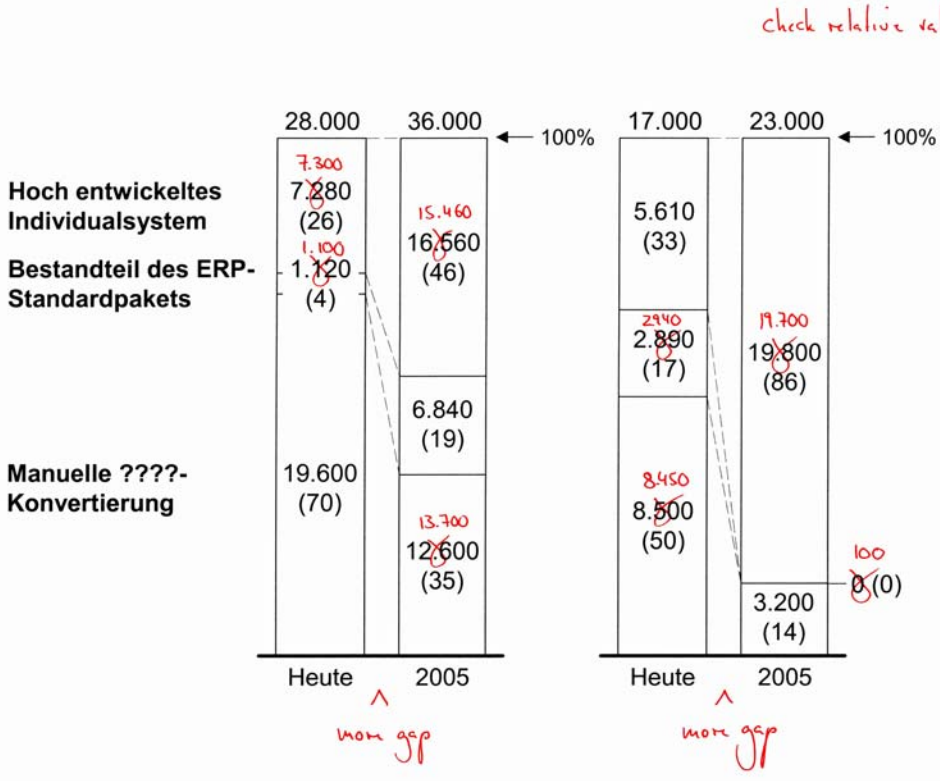
Creation 17

PPT 08:58
TC 02:44



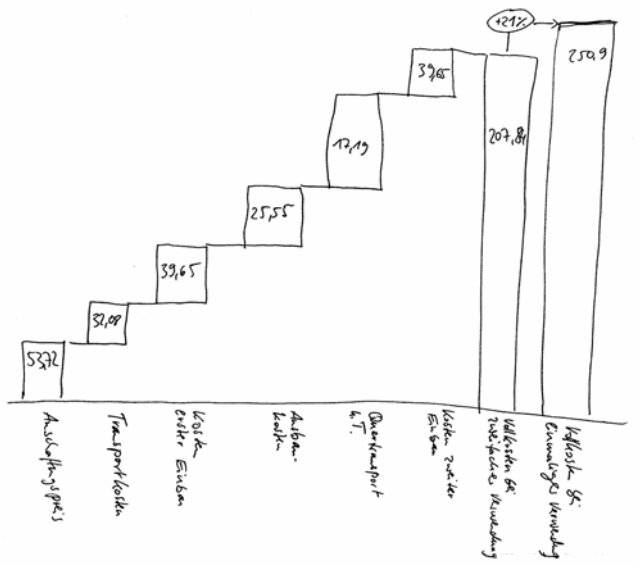
Alteration 17

PPT 00:52
TC 01:00



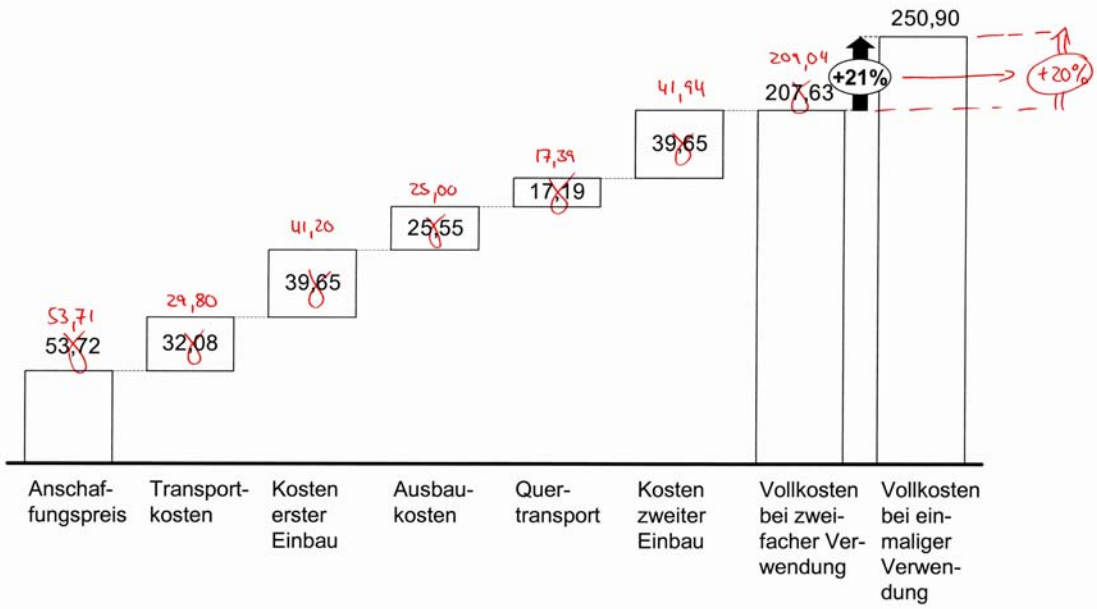
Creation 18

PPT 07:26
TC 02:53



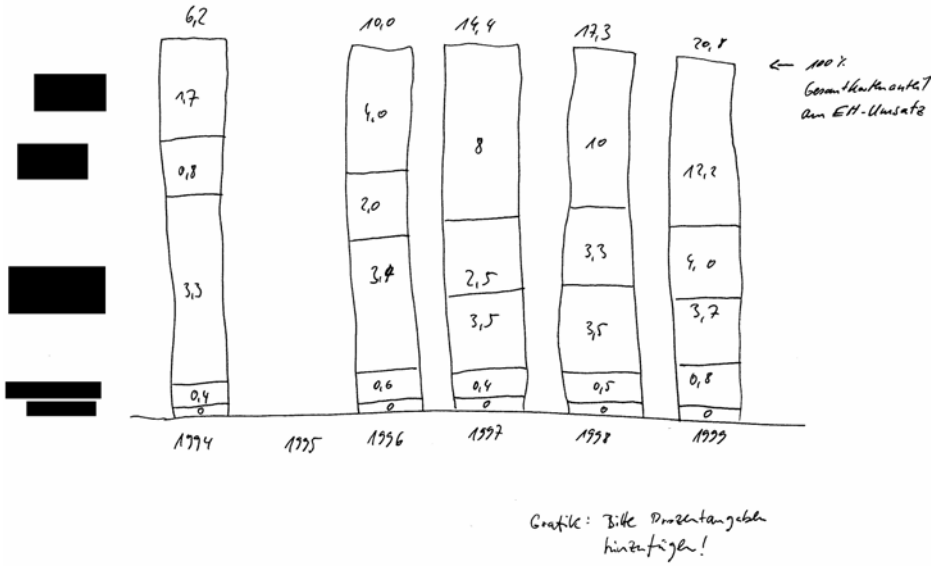
Alteration 18

PPT 08:40
TC 00:27



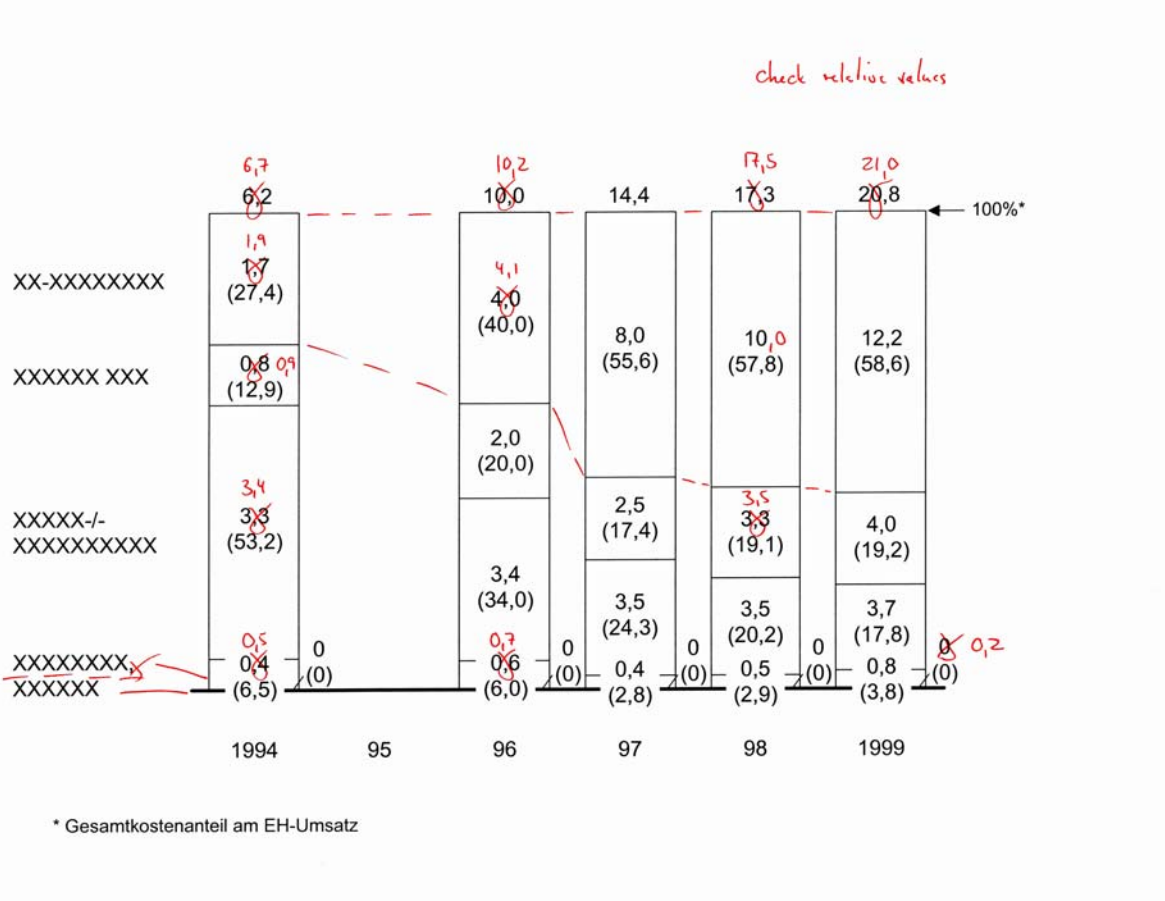
Creation 19

PPT 15:51
TC 03:21



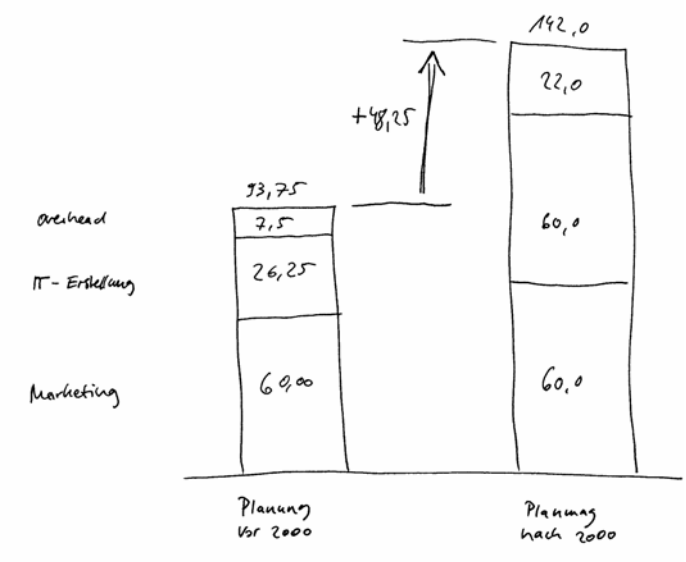
Alteration 19

PPT 06:43
TC 00:47



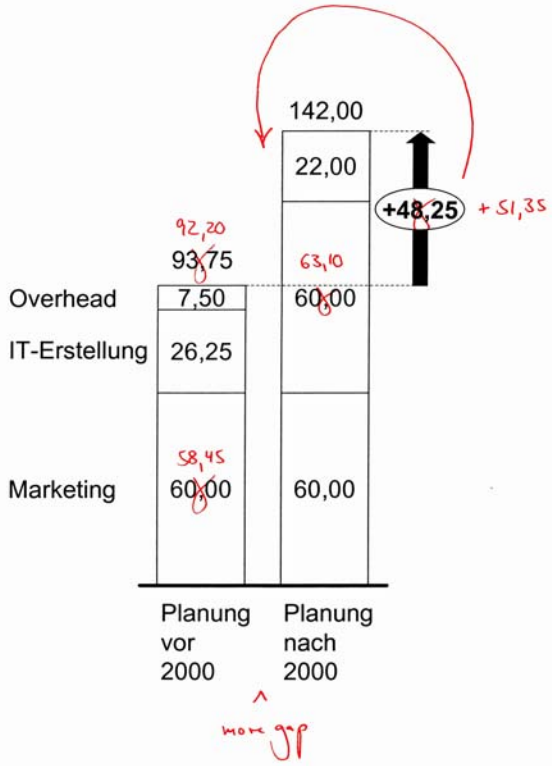
Creation 20

PPT 03:48
TC 01:42



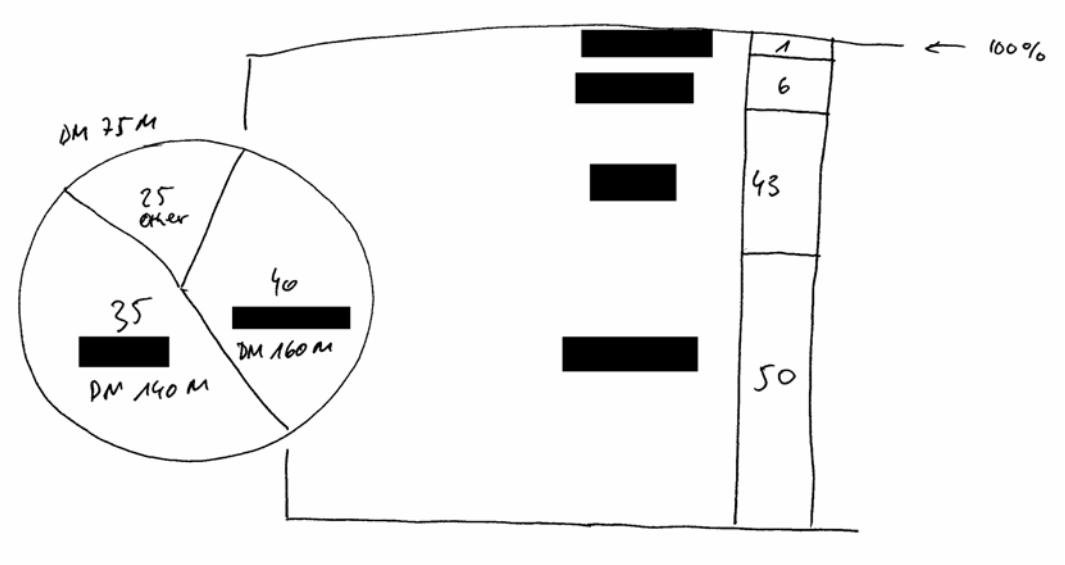
Alteration 20

PPT 03:22
TC 00:36



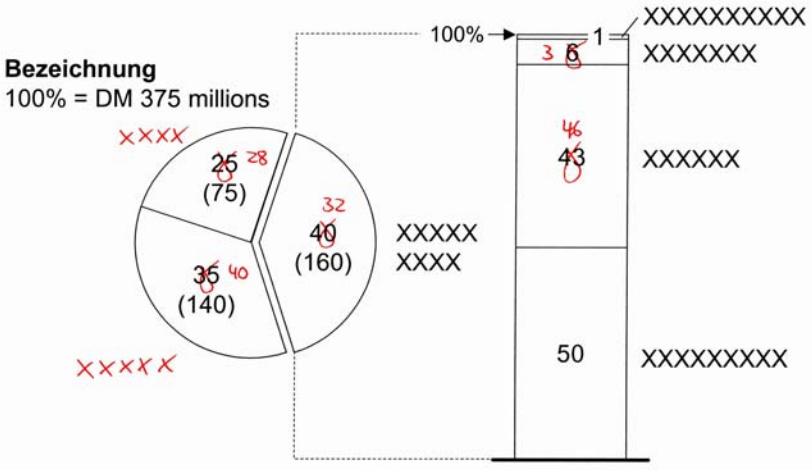
Creation 21

PPT 05:48
TC 02:40



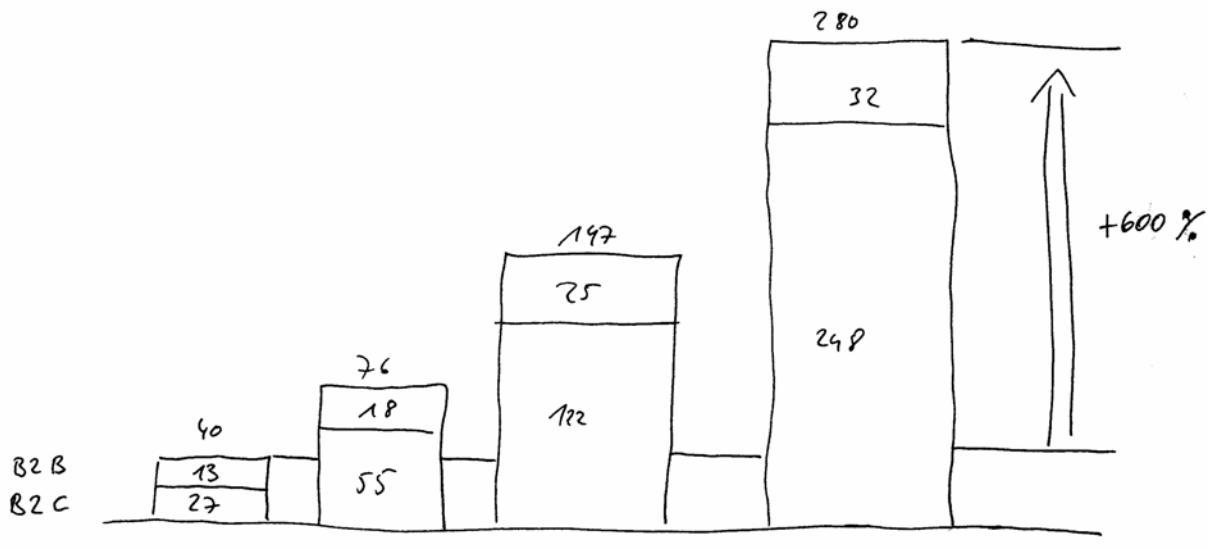
Alteration 21

PPT 05:13
TC 00:33



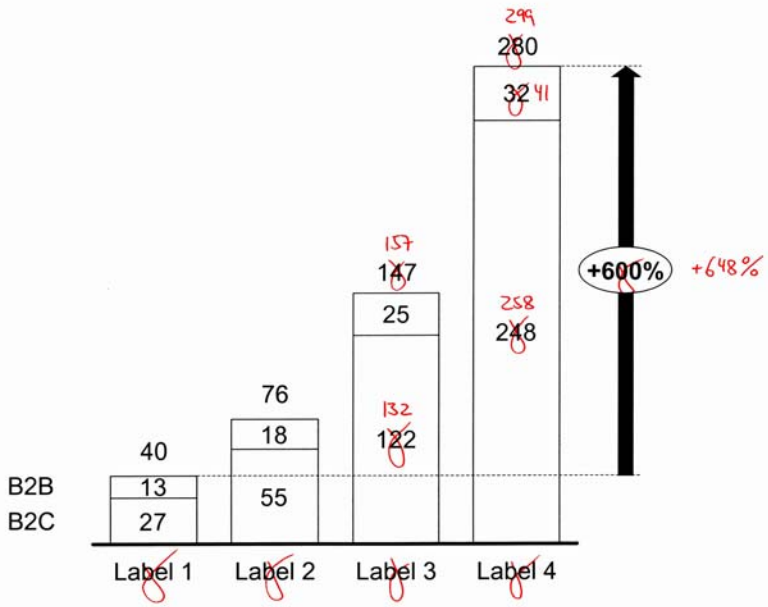
Creation 22

PPT 02:54
TC 01:22



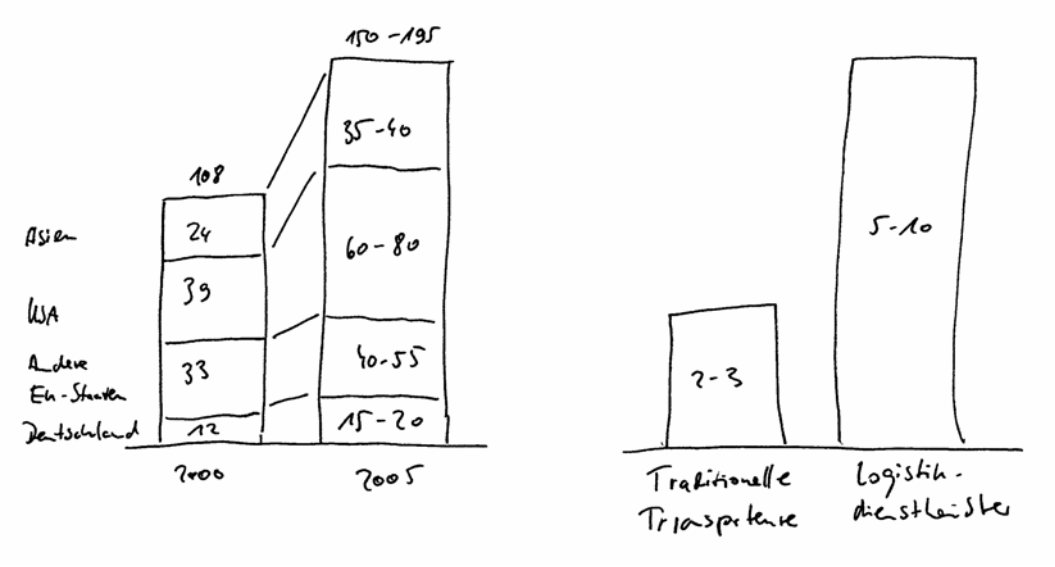
Alteration 22

PPT 02:41
TC 00:33



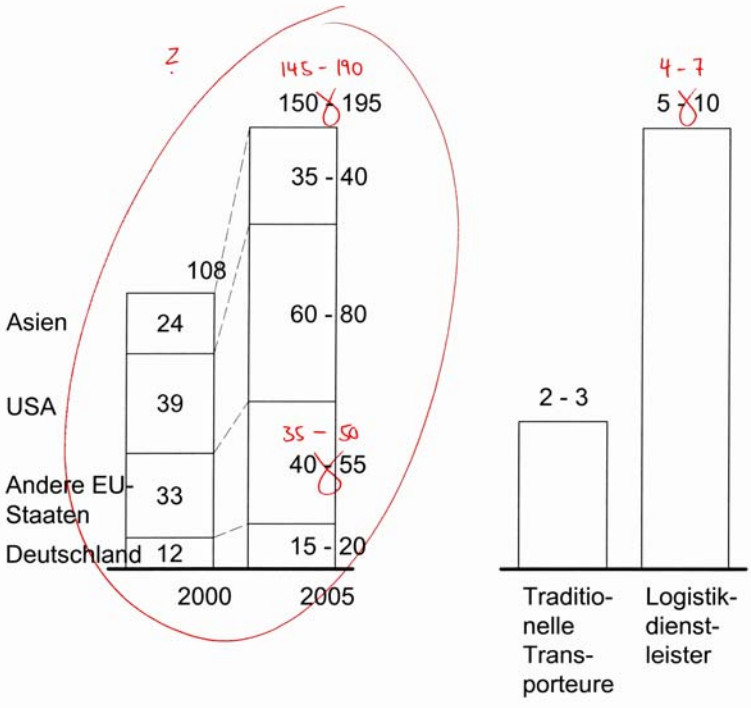
Creation 23

PPT 03:56
TC 02:43



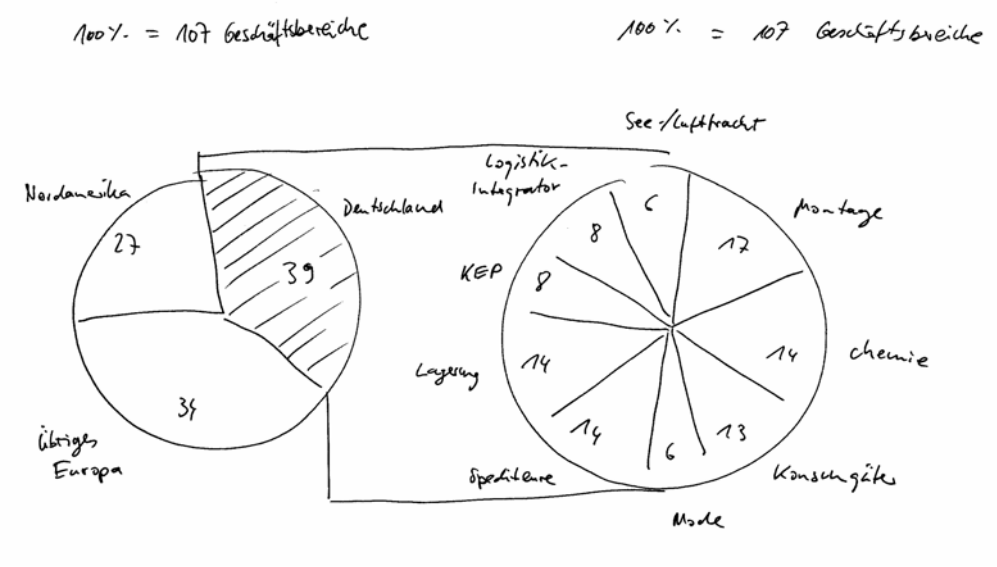
Alteration 23

PPT 02:06
TC 00:35



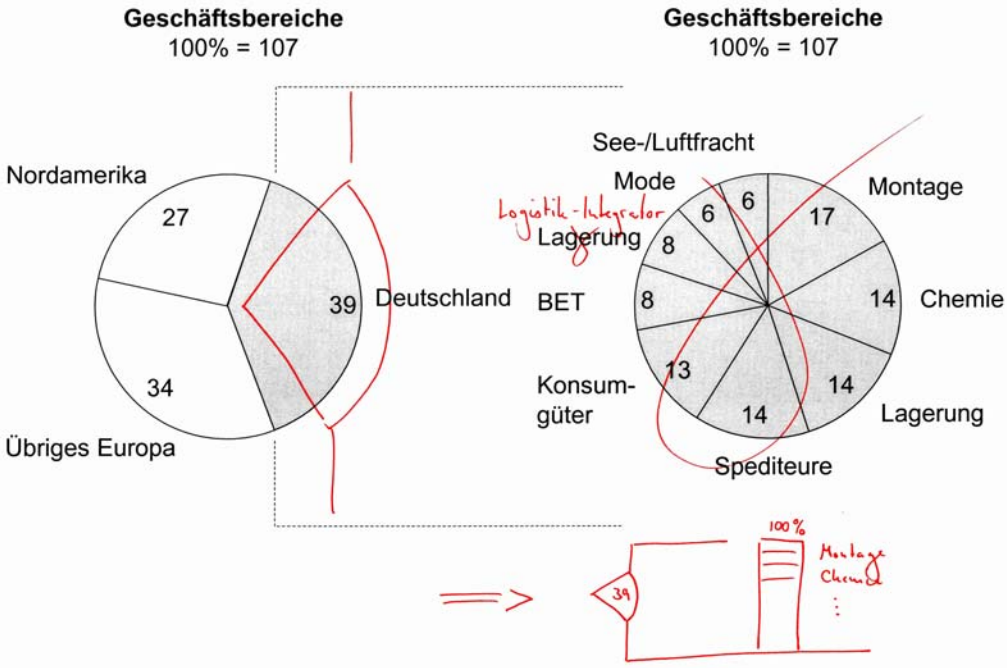
Creation 24

PPT 04:16
TC 03:11



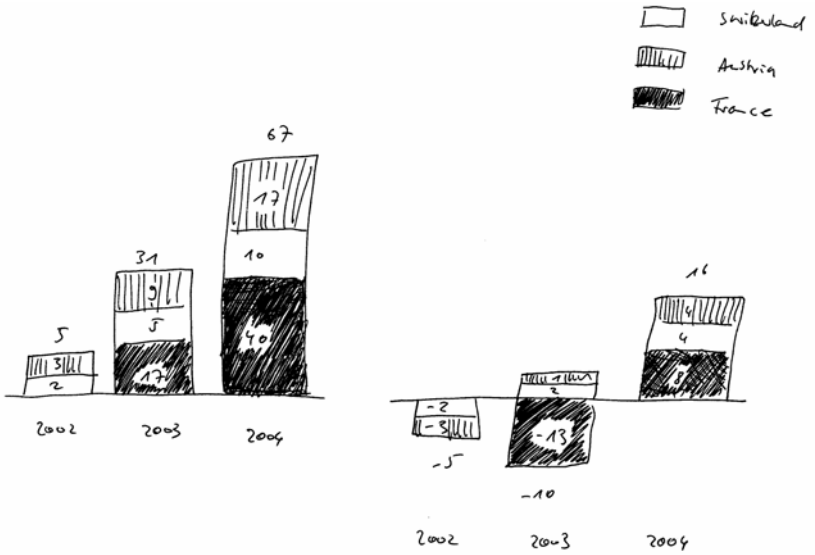
Alteration 24

PPT 04:35
TC 01:21



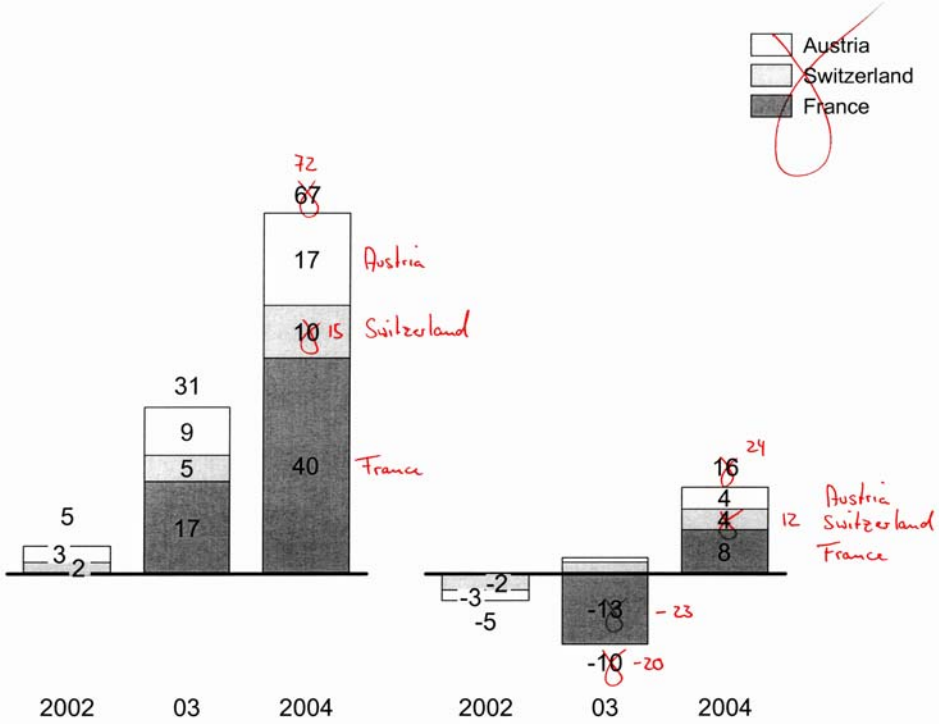
Creation 25

PPT 05:39
TC 02:18



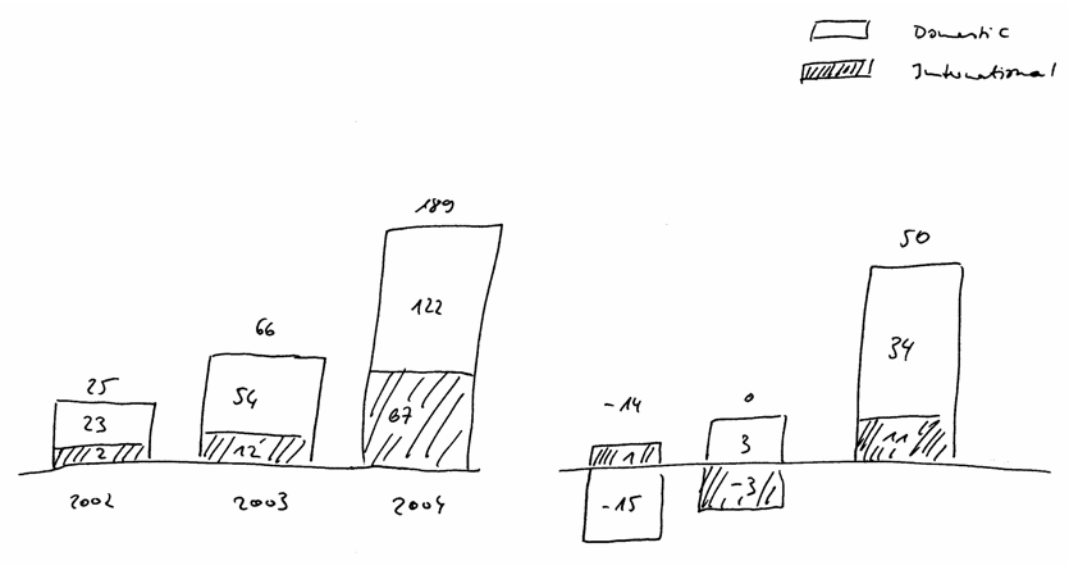
Alteration 25

PPT 02:52
TC 01:42



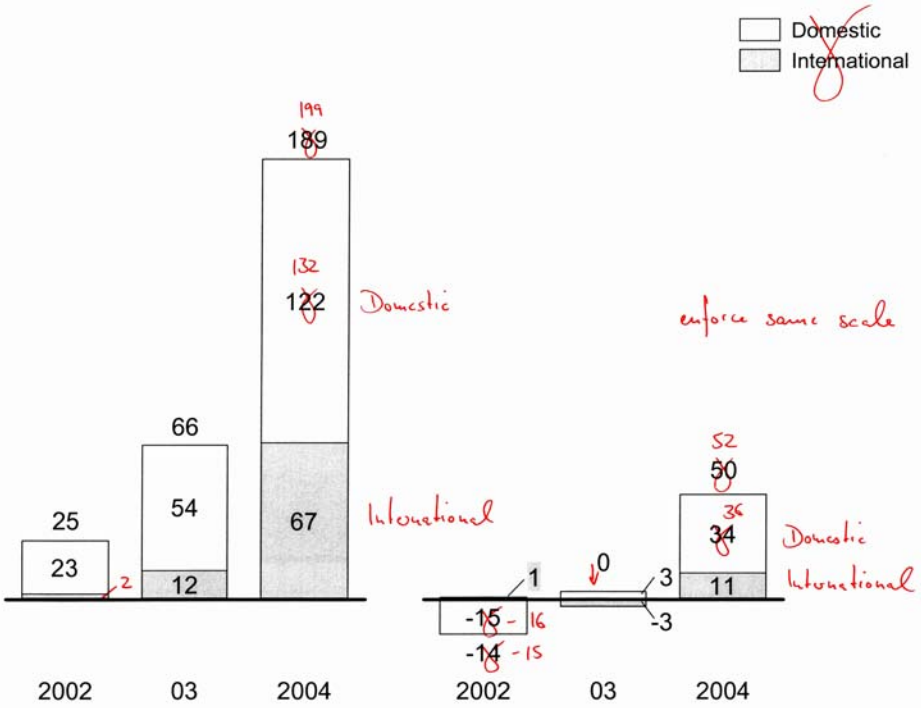
Creation 26

PPT 05:12
TC 01:47



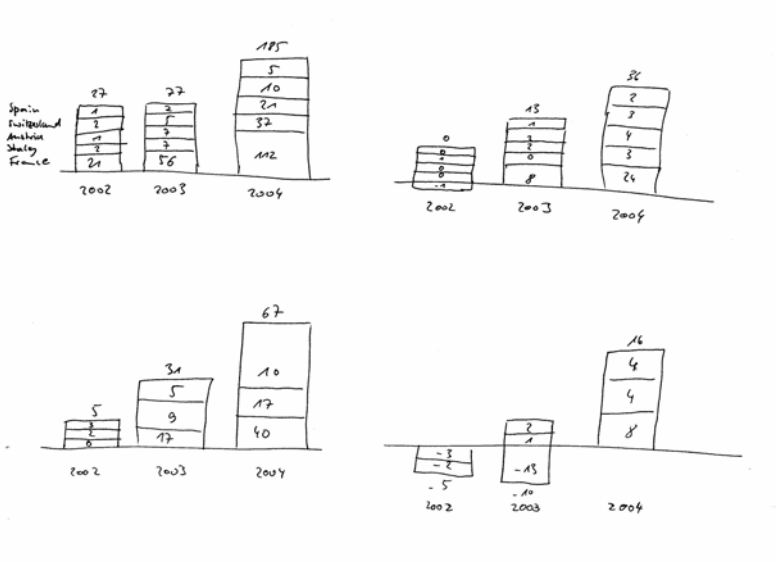
Alteration 26

PPT 02:12
TC 01:15



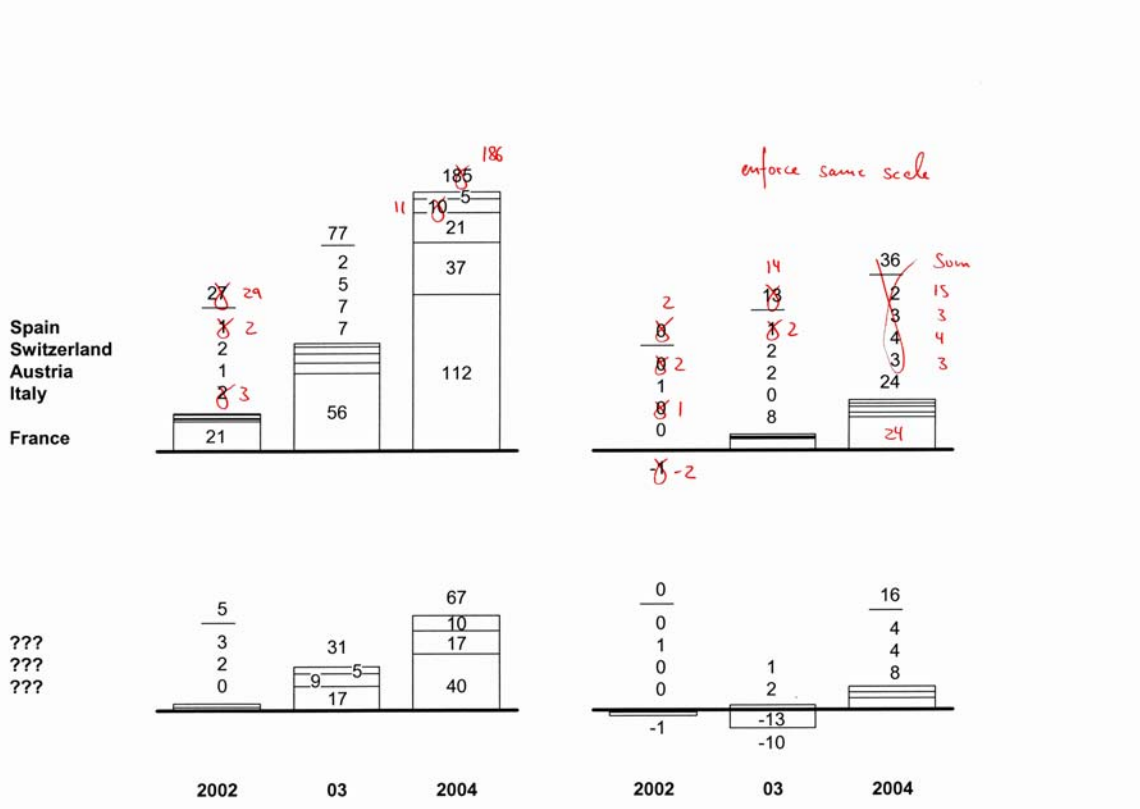
Creation 27

PPT 15:58
TC 03:15



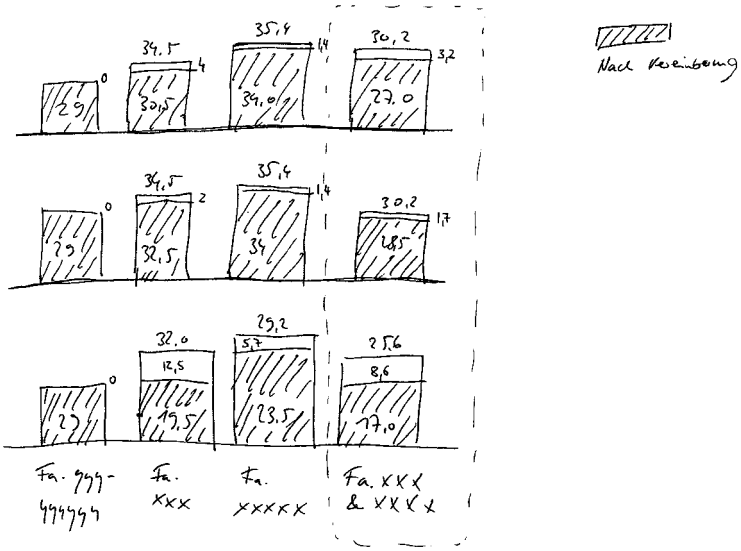
Alteration 27

PPT 04:23
TC 00:50



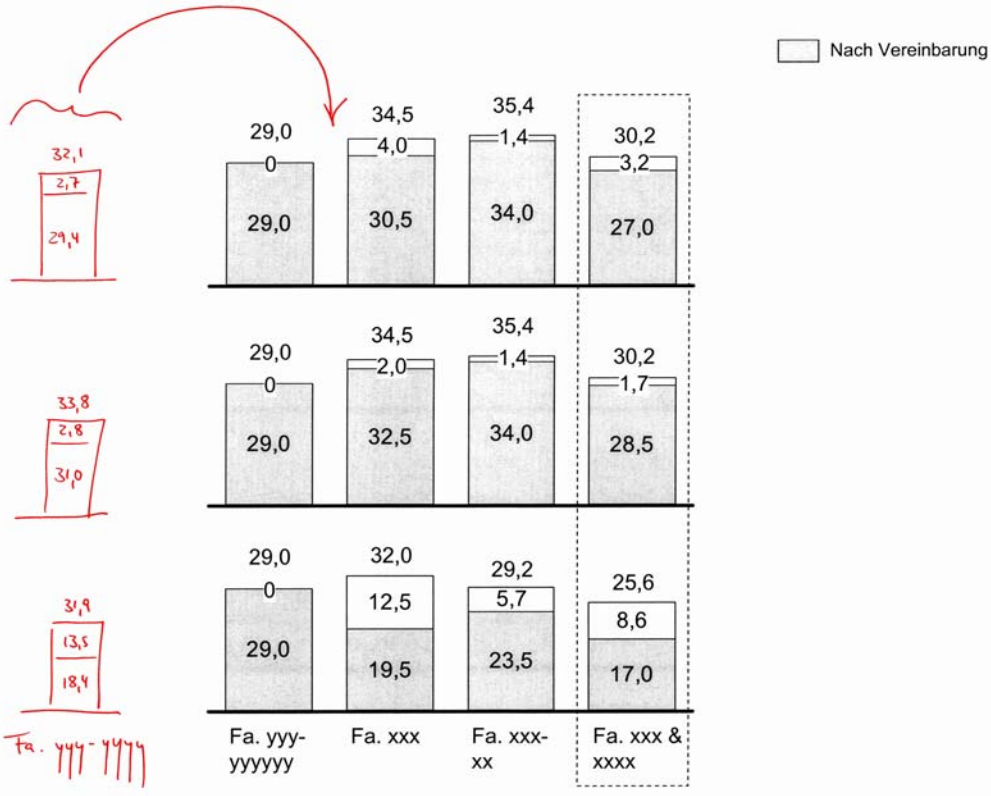
Creation 28

PPT 07:33
TC 02:53



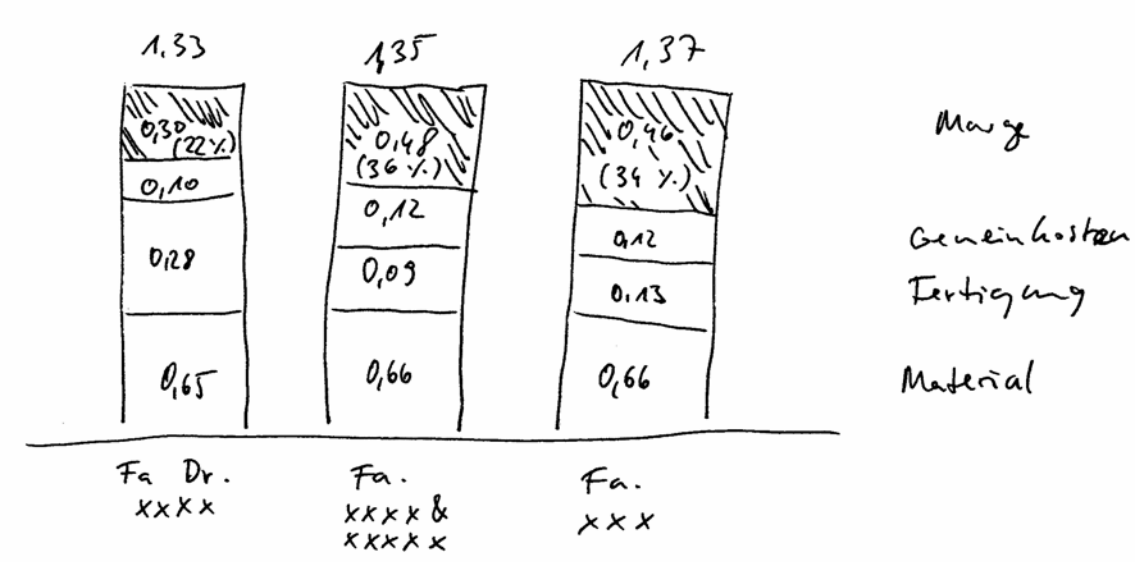
Alteration 28

PPT 07:12
TC 01:07



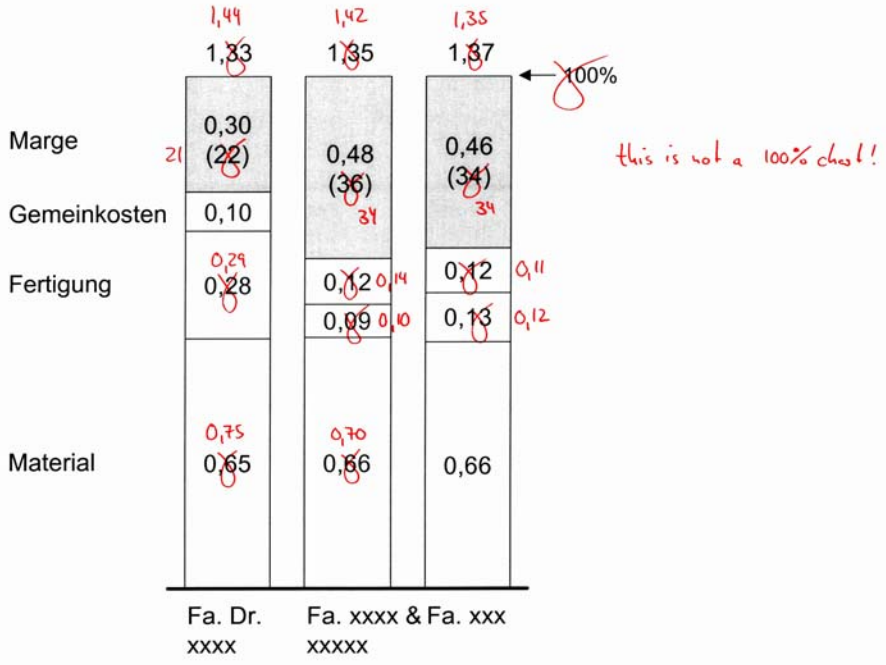
Creation 29

PPT 04:40
TC 01:56



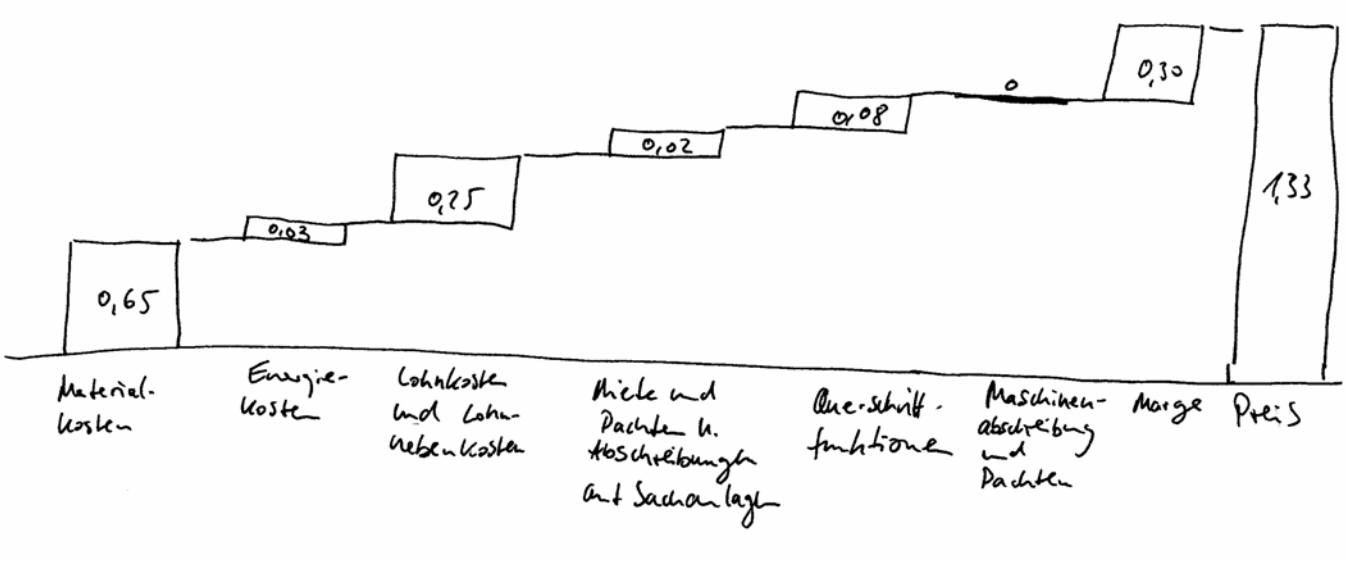
Alteration 29

PPT 01:10
TC 00:35



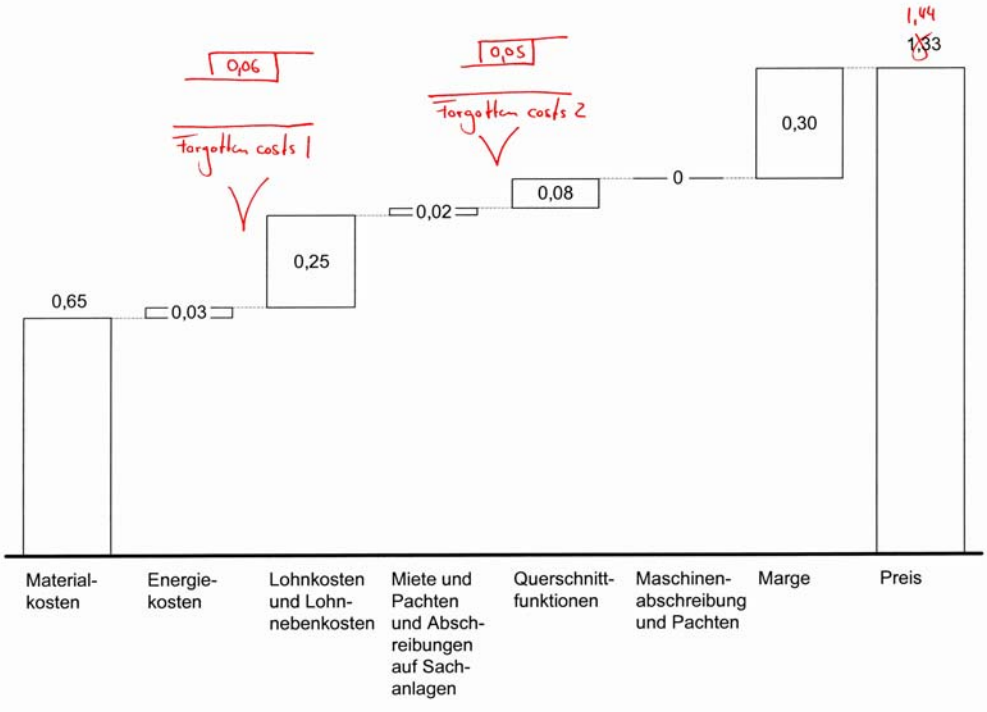
Creation 30

PPT 04:37
TC 02:01



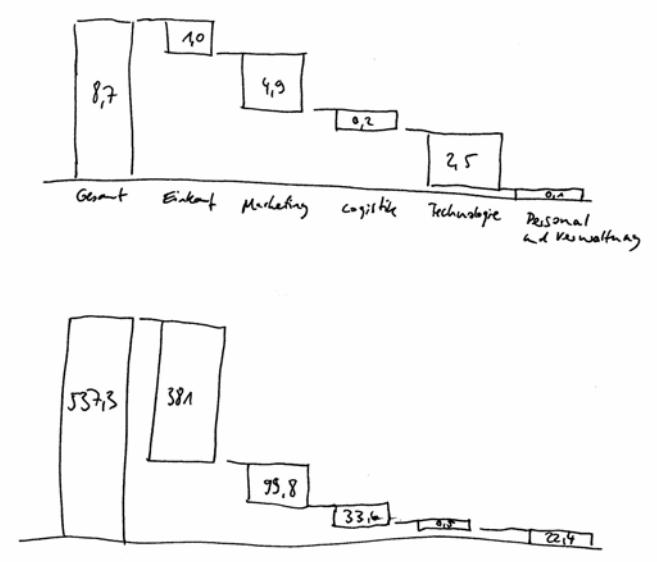
Alteration 30

PPT 06:06
TC 00:58



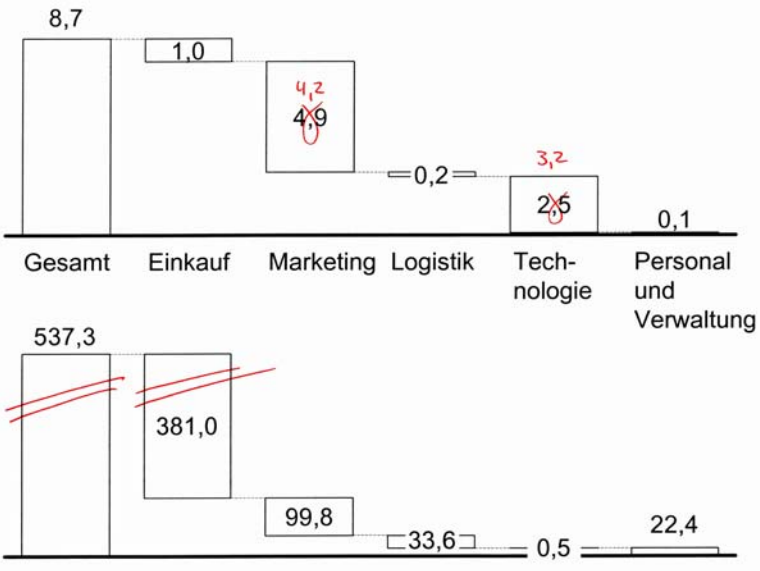
Creation 31

PPT 06:31
TC 00:51



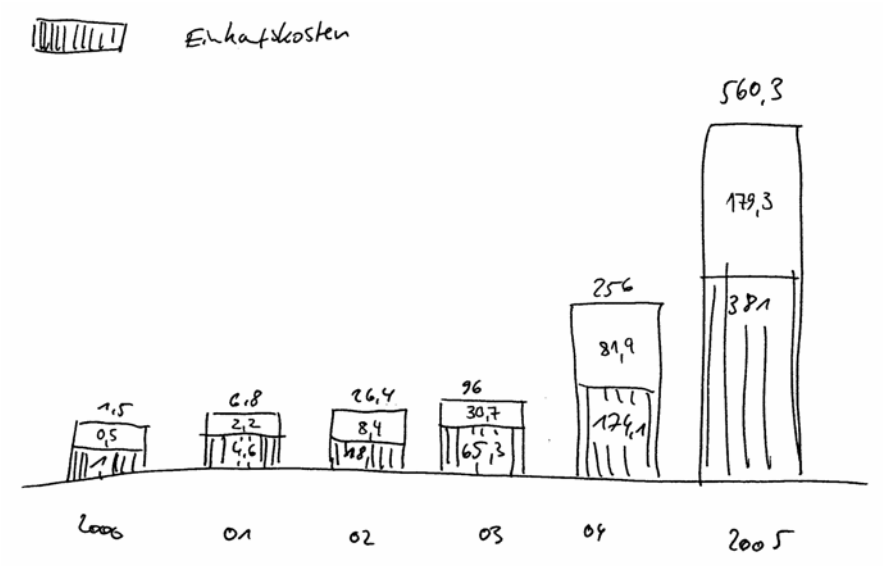
Alteration 31

PPT 04:02
TC 00:15



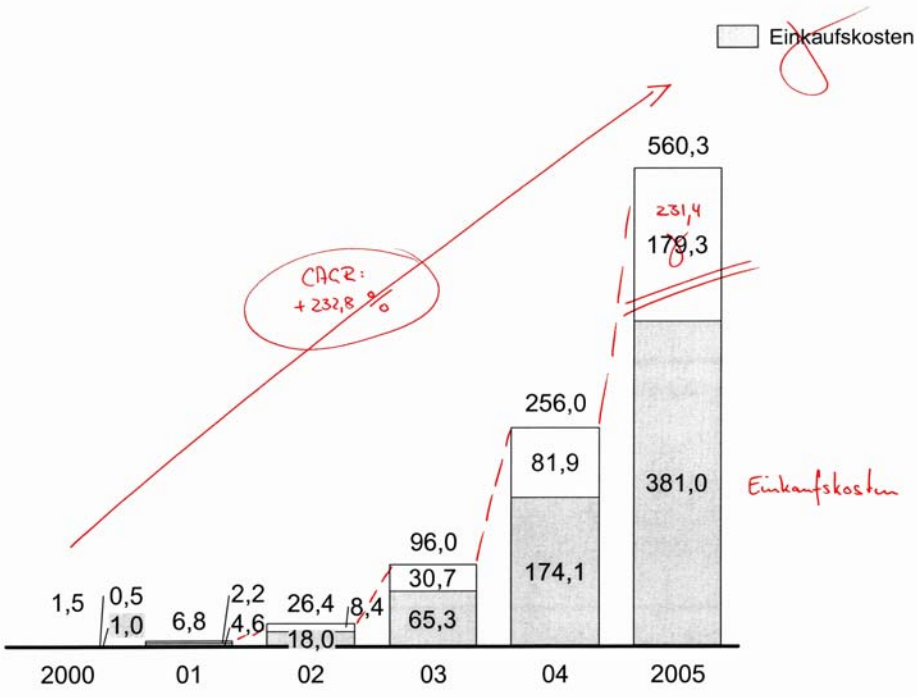
Creation 32

PPT 04:50
TC 01:38



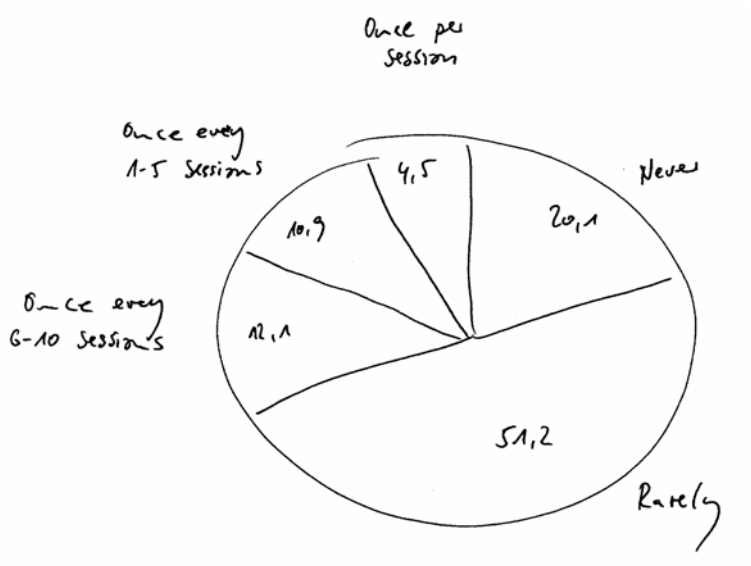
Alteration 32

PPT 04:51
TC 00:36



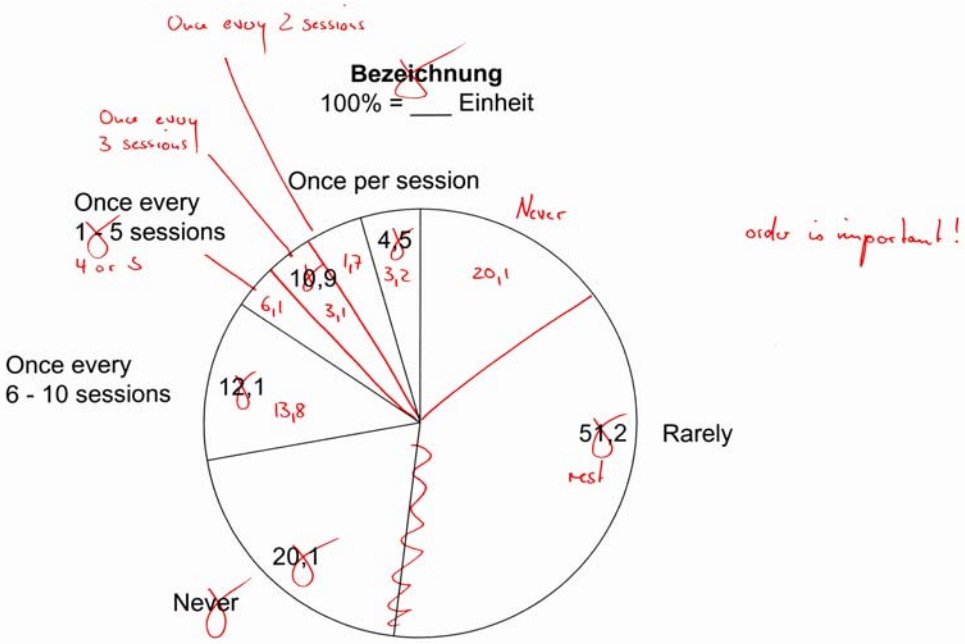
Creation 33

PPT 02:01
TC 01:10



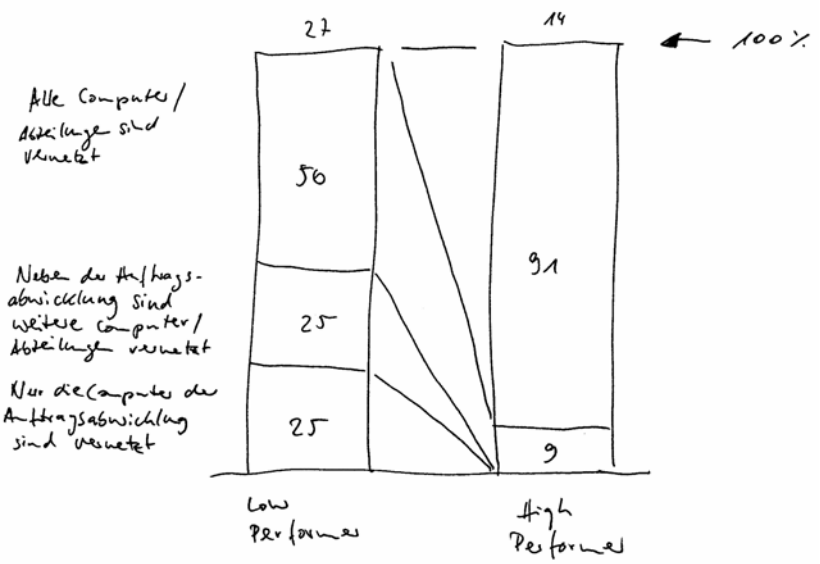
Alteration 33

PPT 04:38
TC 02:13



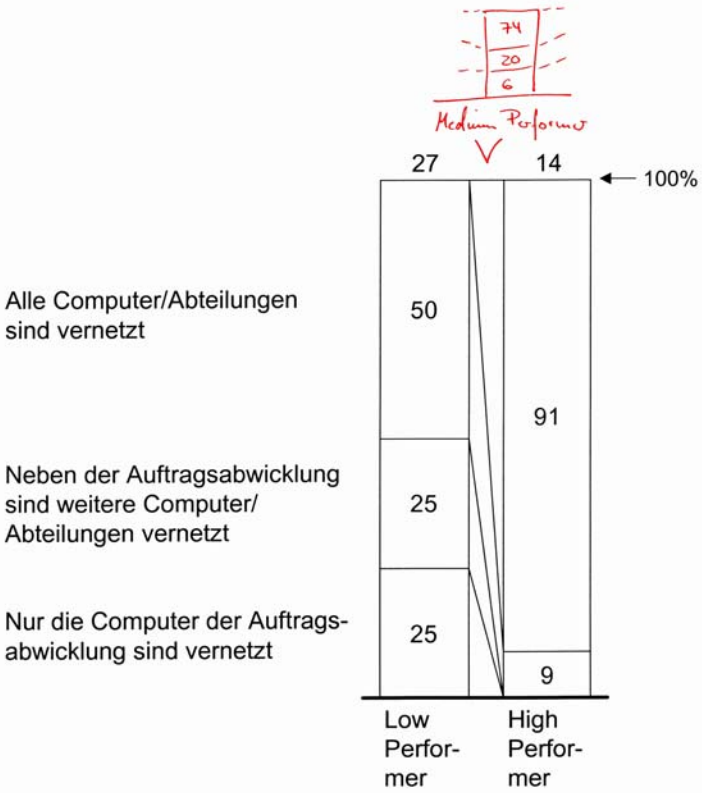
Creation 34

PPT 03:00
TC 02:13



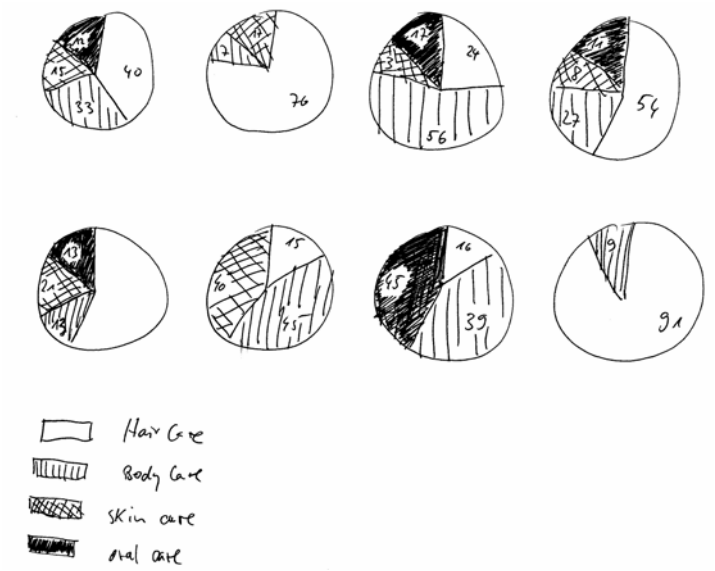
Alteration 34

PPT 03:47
TC 00:40



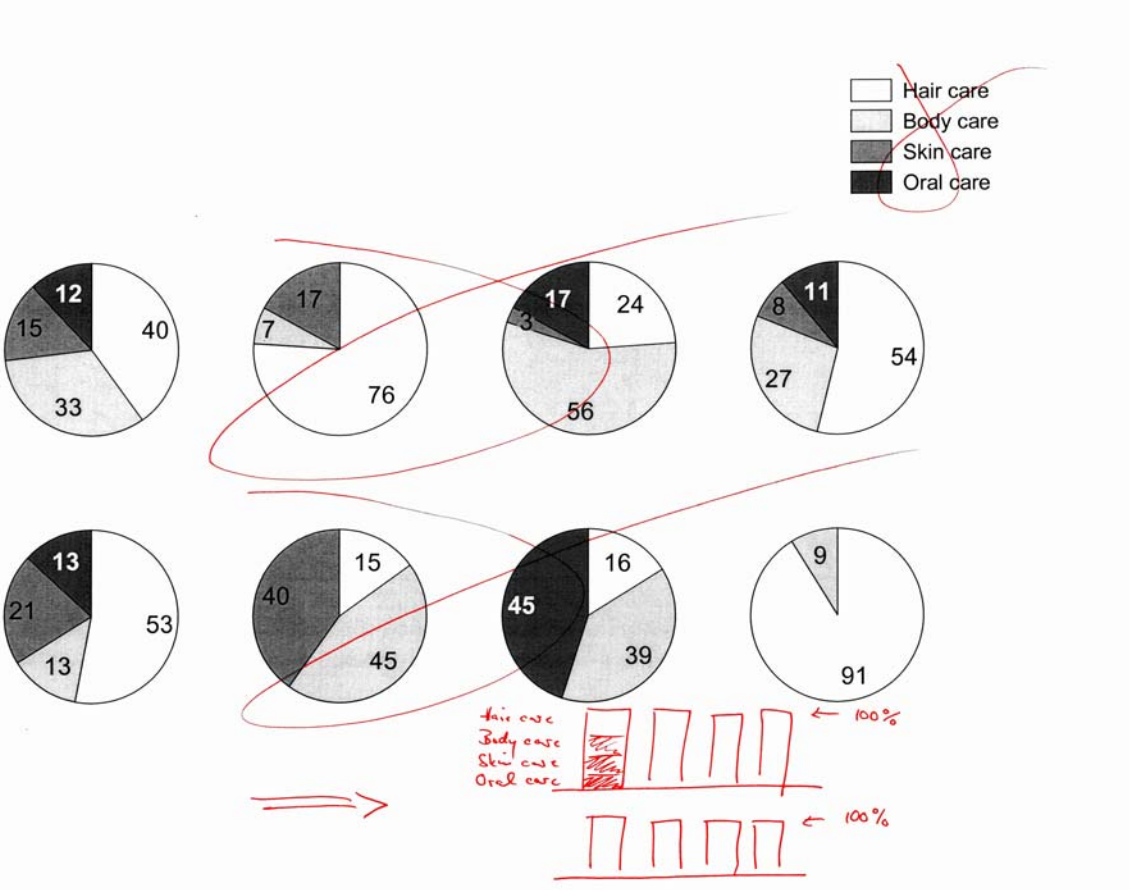
Creation 35

PPT 04:18
TC 02:46



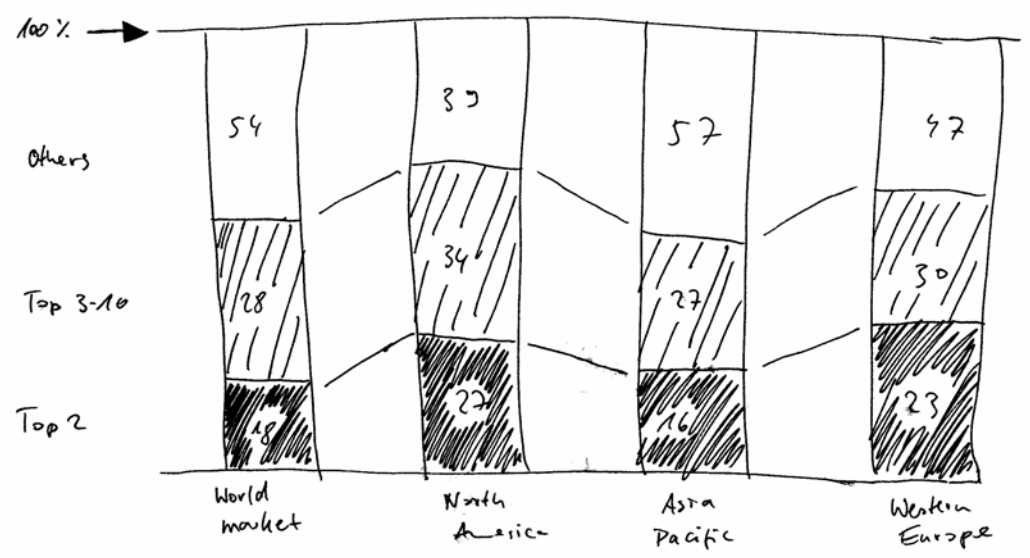
Alteration 35

PPT 04:52
TC 02:01



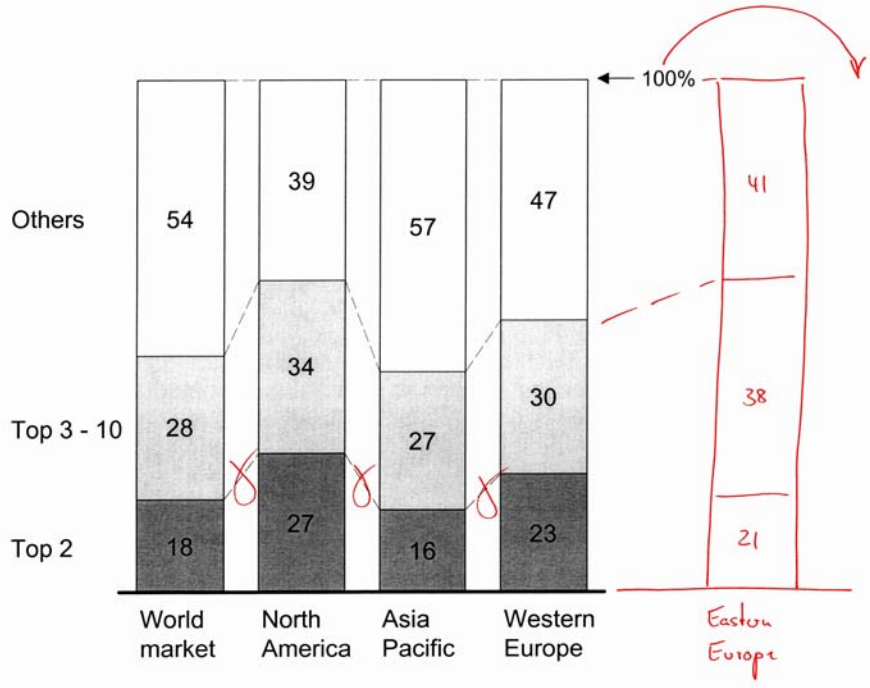
Creation 36

PPT 01:56
TC 01:35



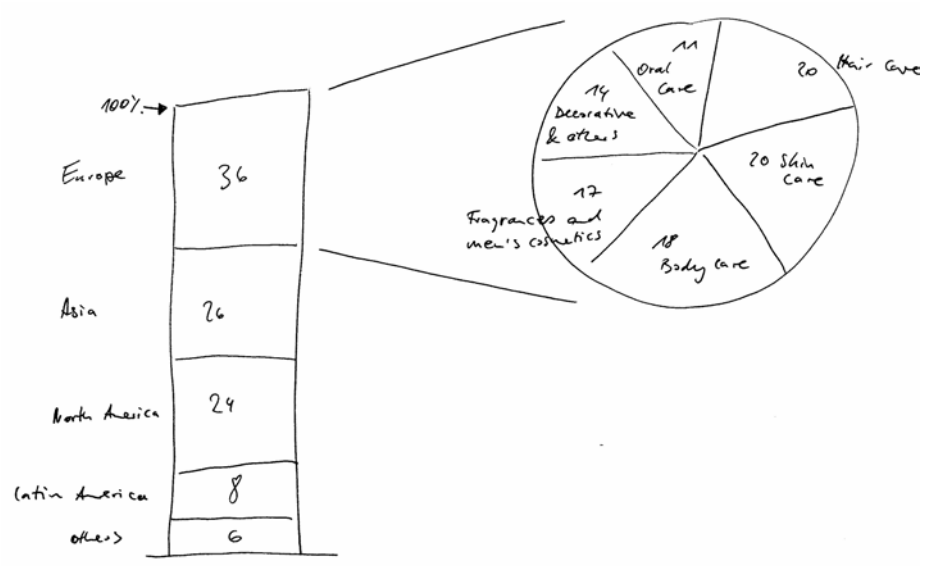
Alteration 36

PPT 01:44
TC 00:20



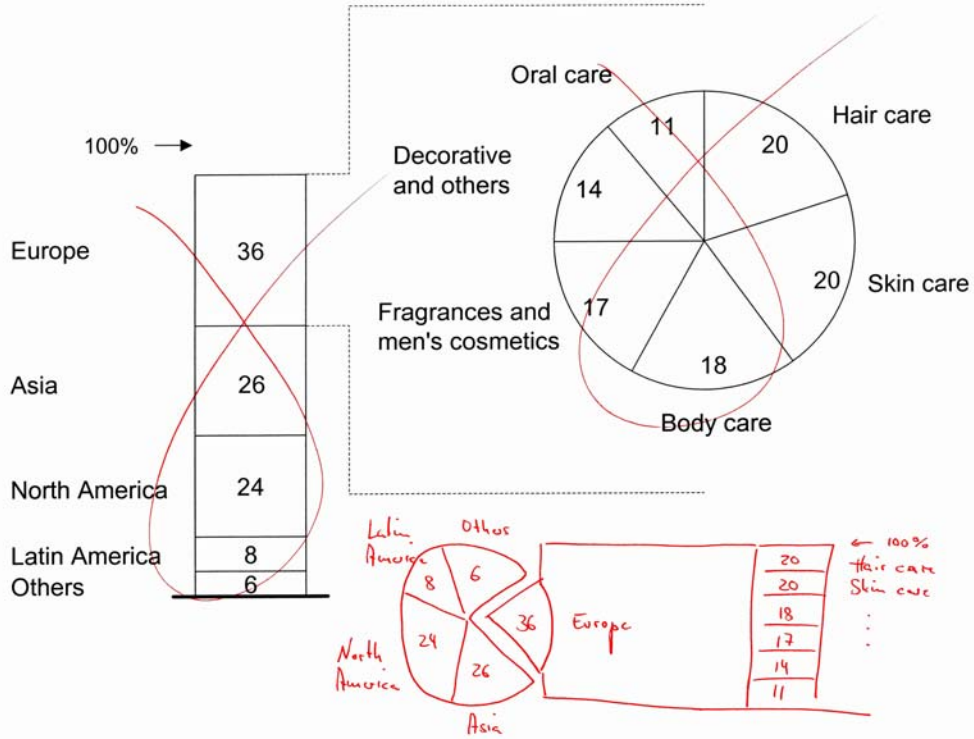
Creation 37

PPT 05:10
TC 02:32



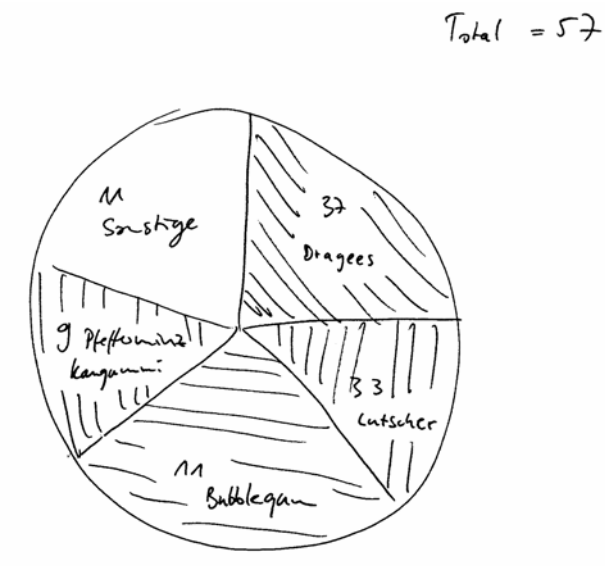
Alteration 37

PPT 03:54
TC 01:26



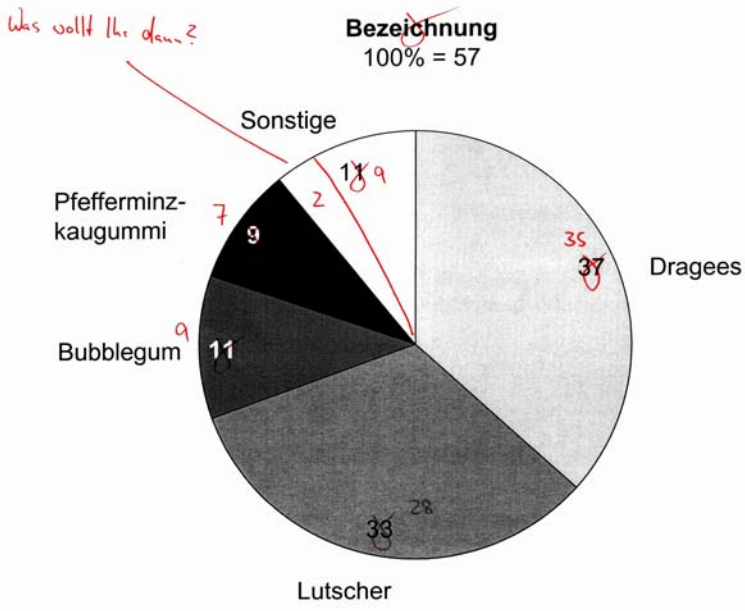
Creation 38

PPT 02:06
TC 01:25



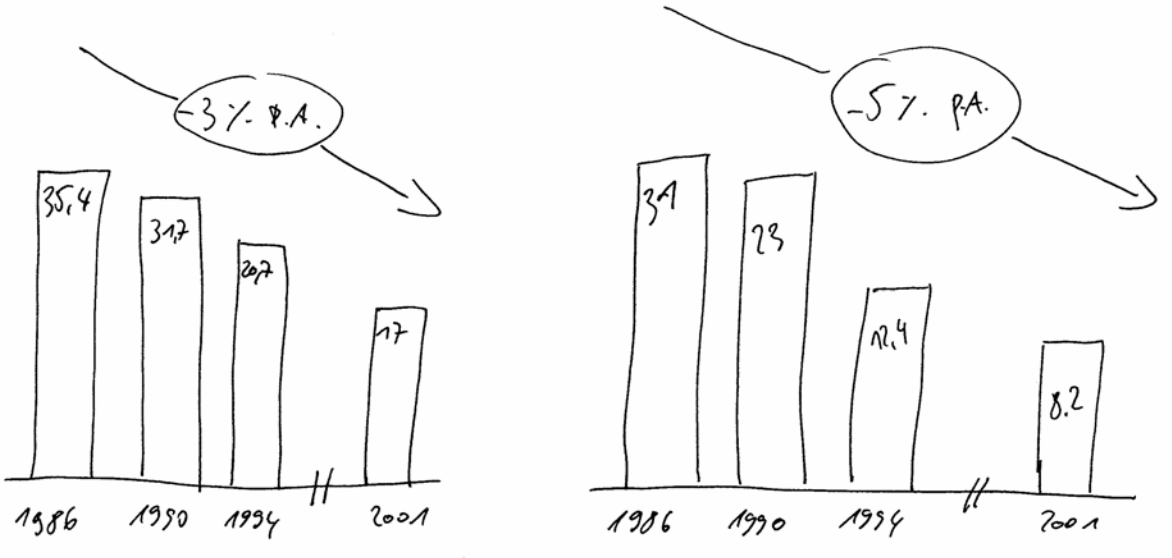
Alteration 38

PPT 02:03
TC 00:37



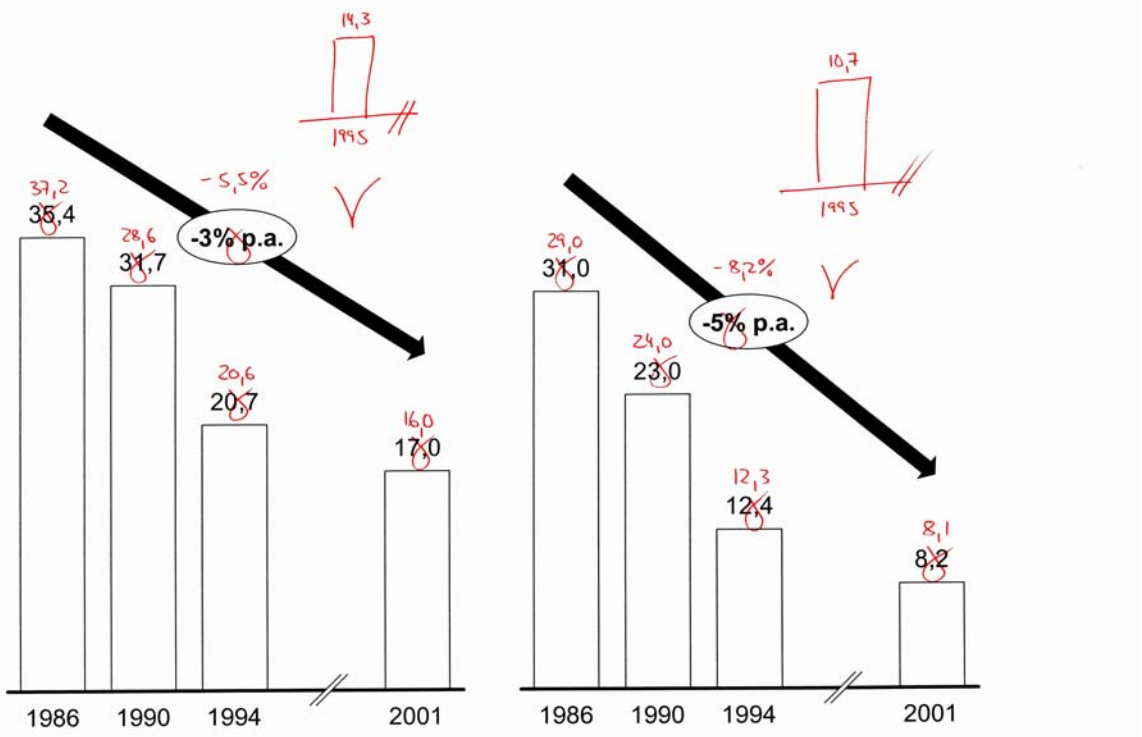
Creation 39

PPT 04:15
TC 01:46



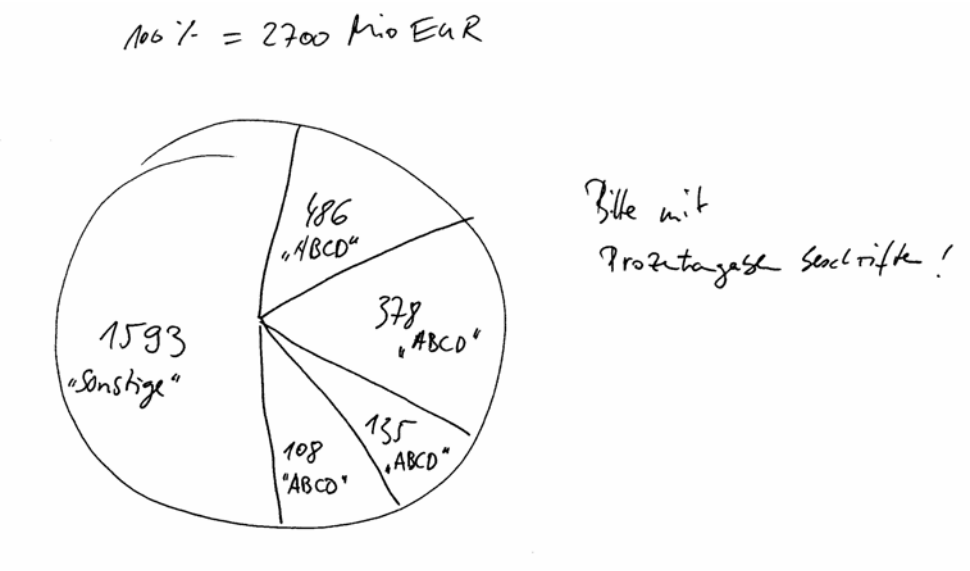
Alteration 39

PPT 02:43
TC 01:26



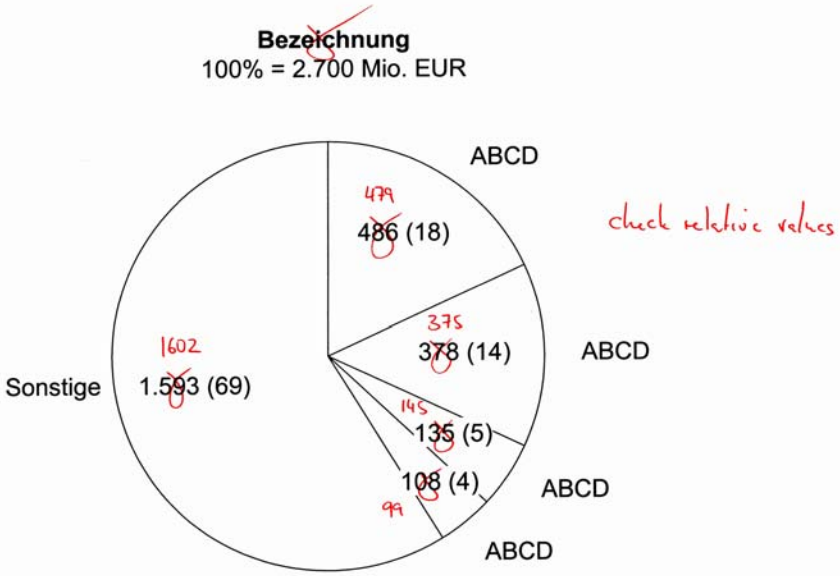
Creation 40

PPT 03:19
TC 01:28



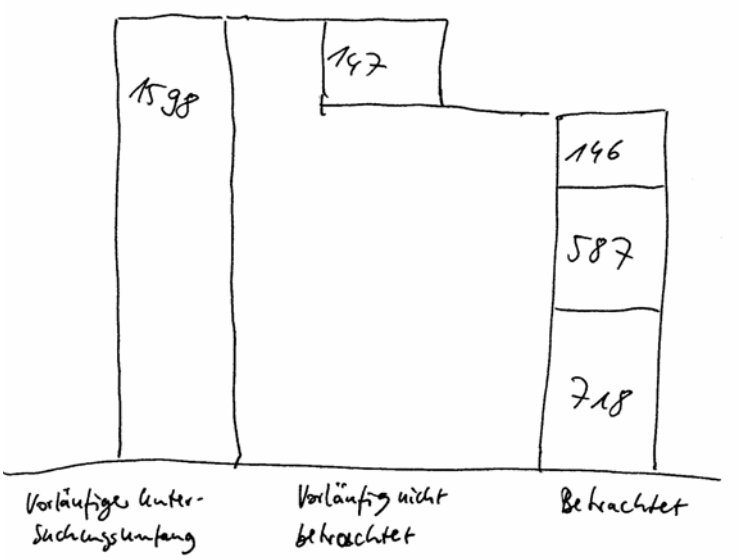
Alteration 40

PPT 01:20
TC 00:26



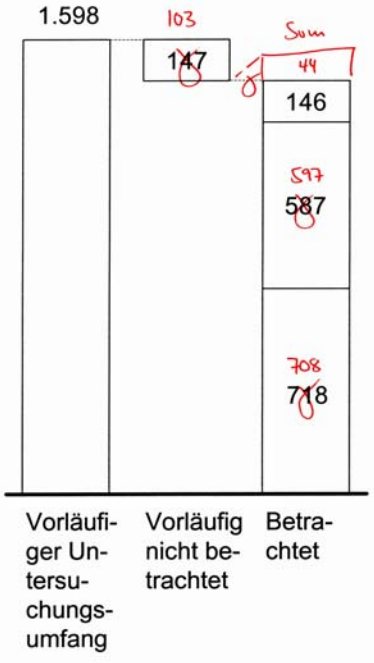
Creation 41

PPT 01:59
TC 01:47



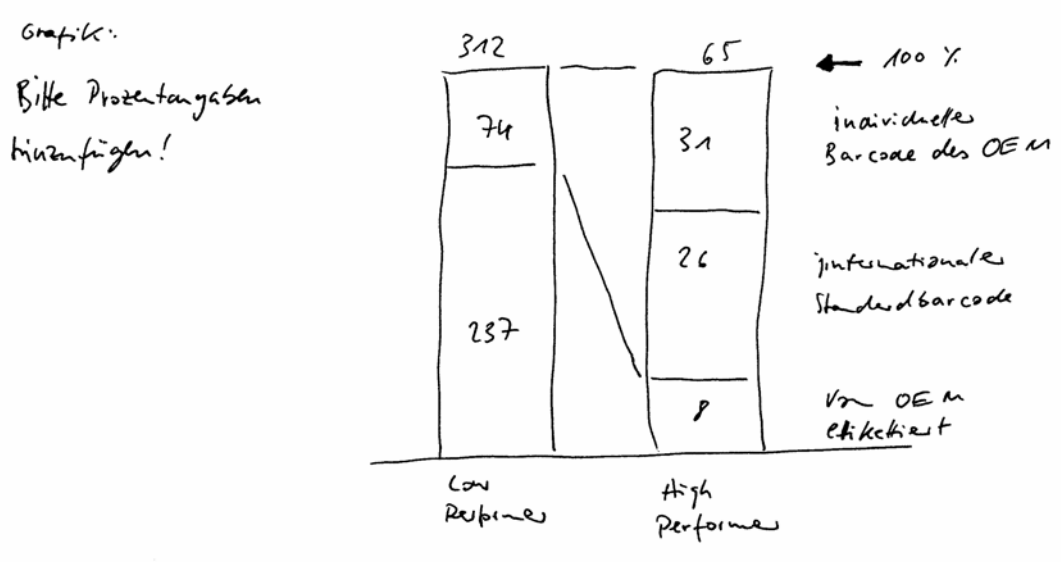
Alteration 41

PPT 02:00
TC 00:33



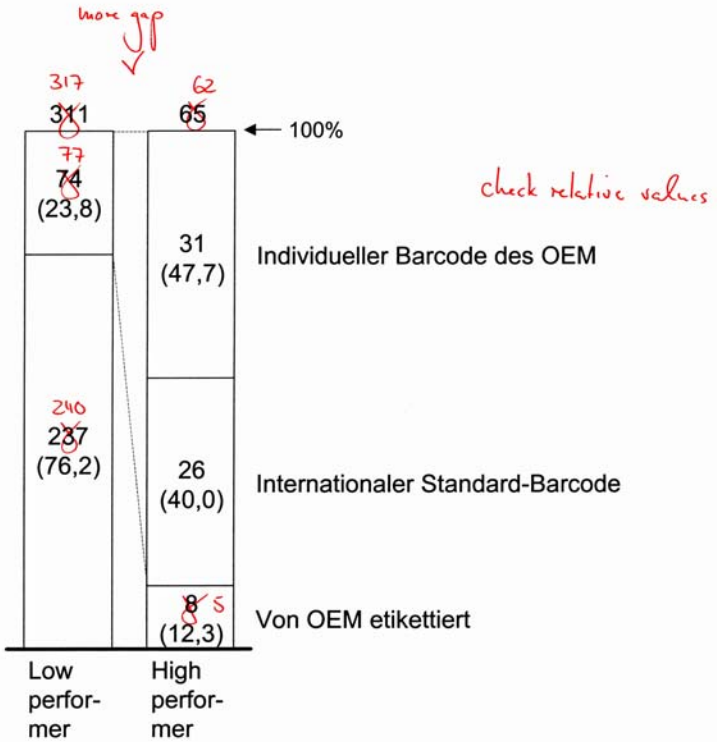
Creation 42

PPT 06:28
TC 01:39



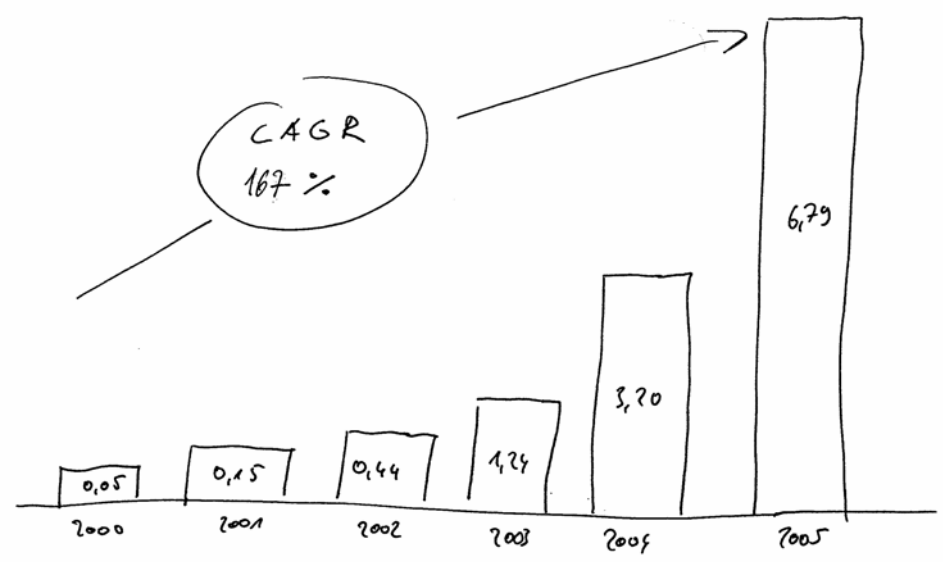
Alteration 42

PPT 03:14
TC 01:15



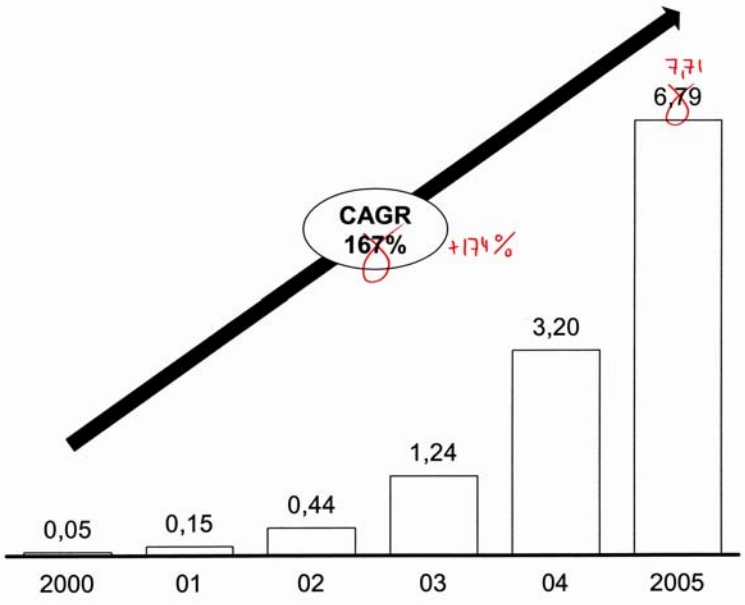
Creation 43

PPT 02:09
TC 00:50



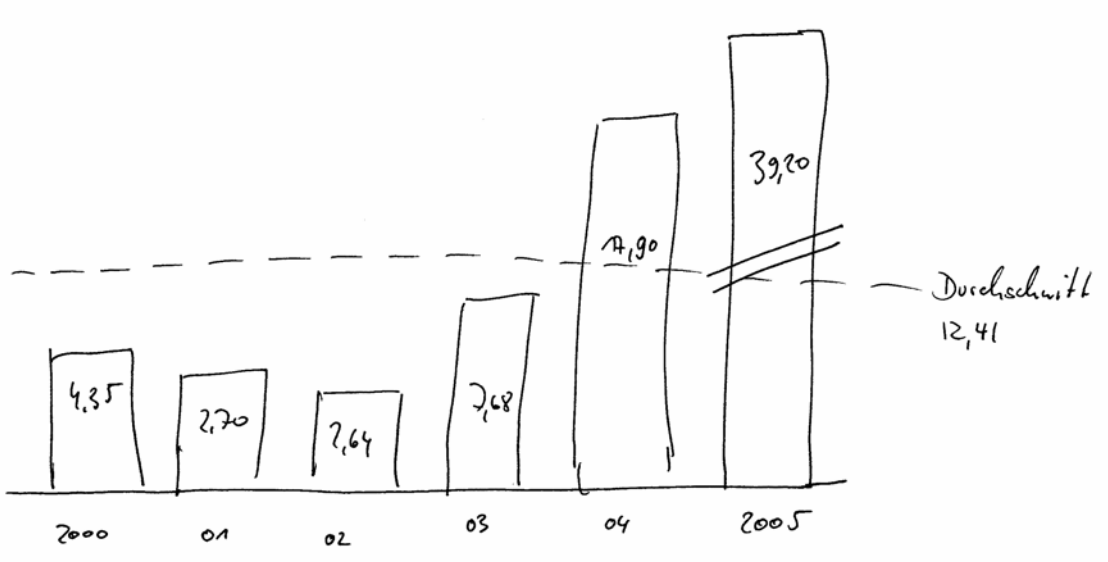
Alteration 43

PPT 01:46
TC 00:10



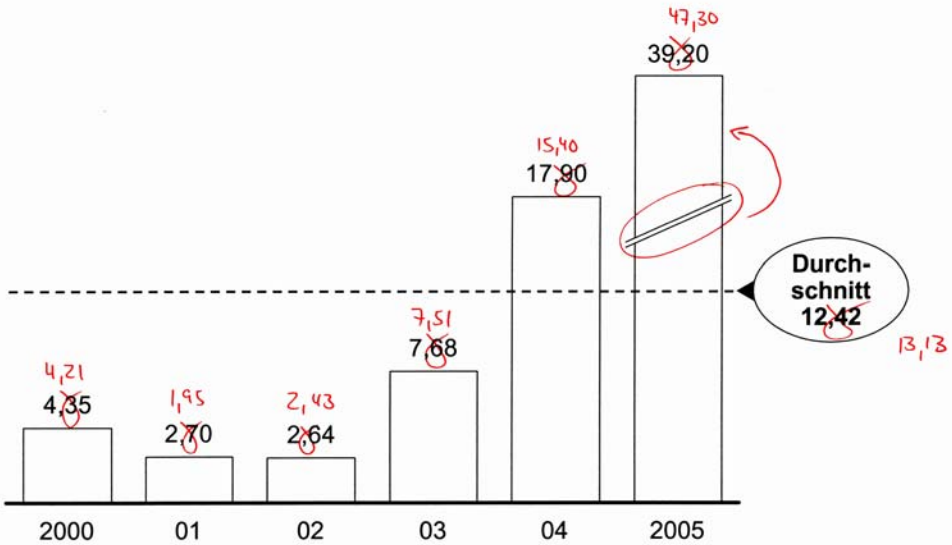
Creation 44

PPT 03:58
TC 01:09



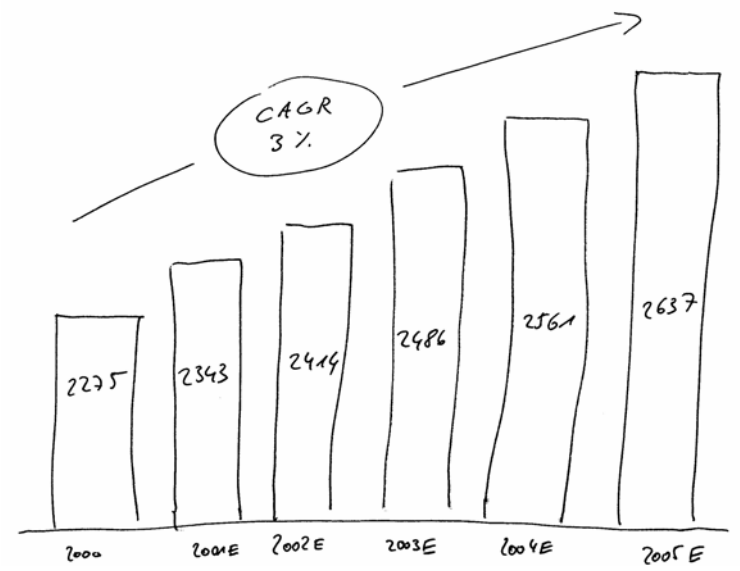
Alteration 44

PPT 01:57
TC 00:36



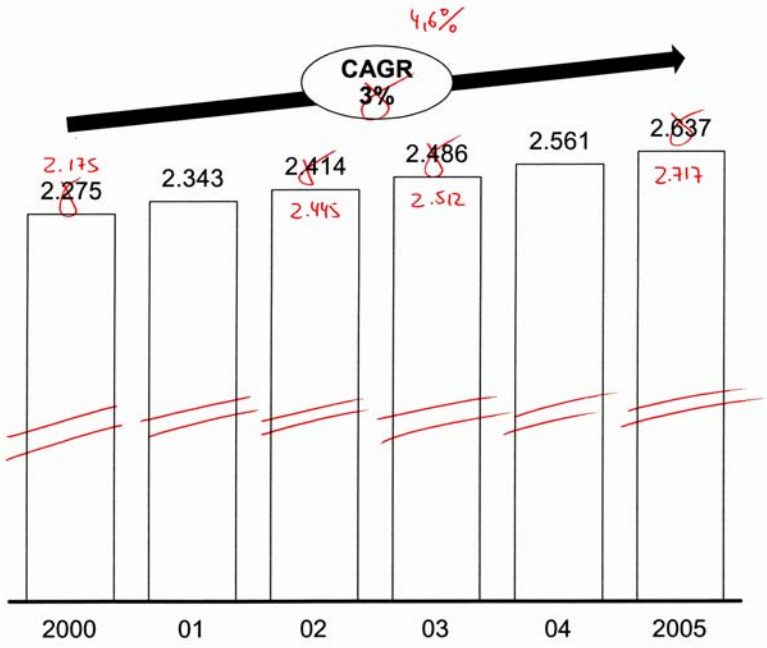
Creation 45

PPT 01:37
TC 01:01



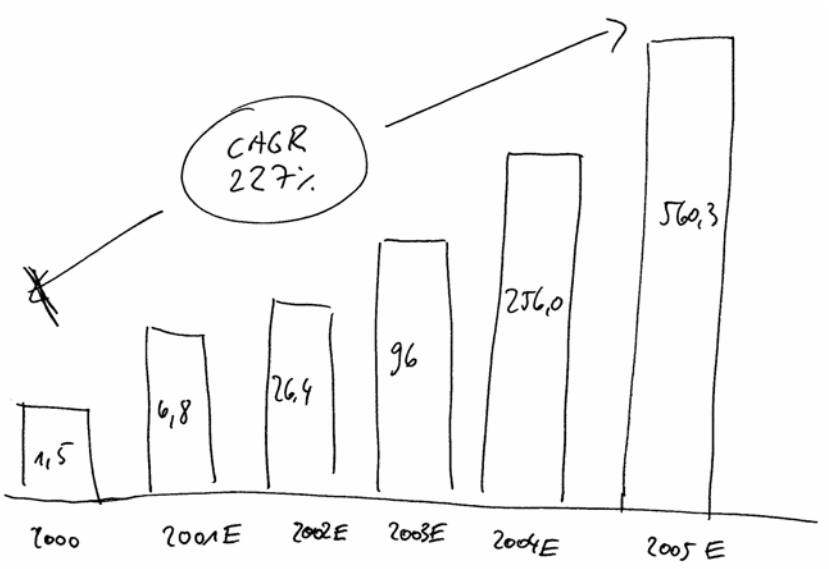
Alteration 45

PPT 02:07
TC 00:14



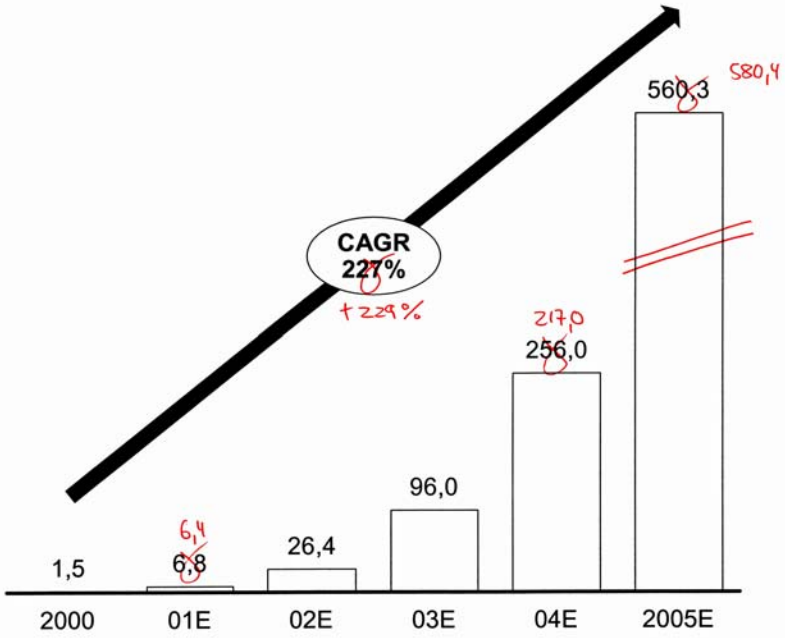
Creation 46

PPT 02:04
TC 00:52



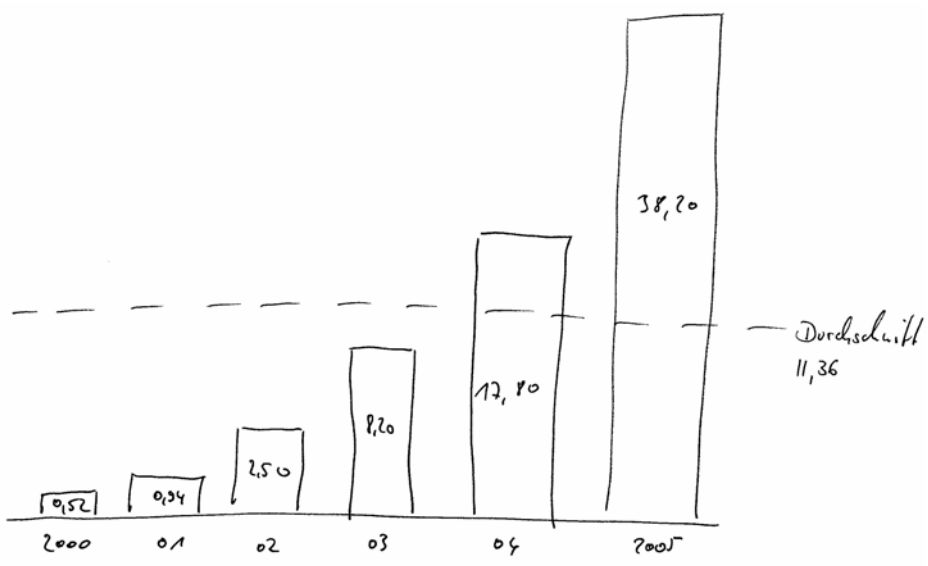
Alteration 46

PPT 03:28
TC 00:22



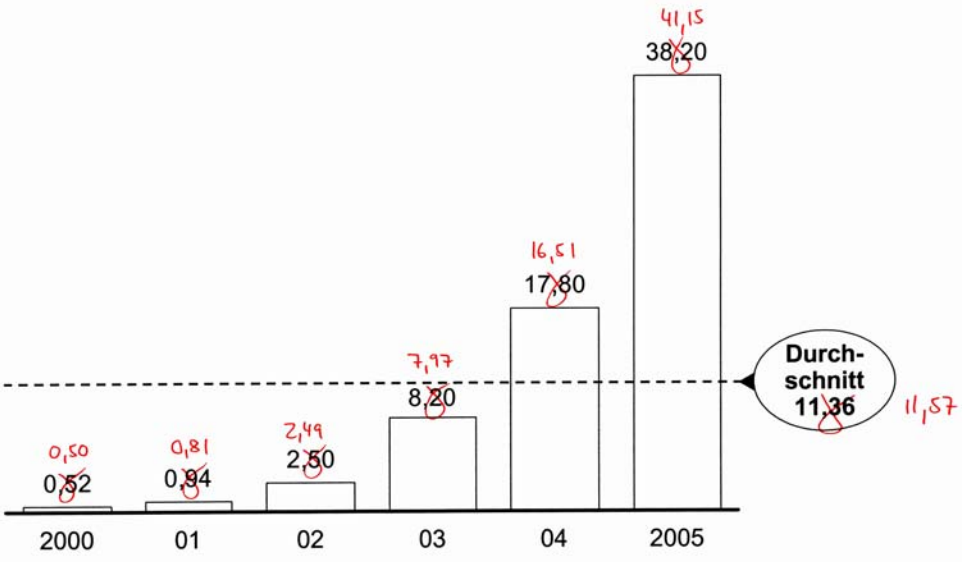
Creation 47

PPT 02:36
TC 00:58



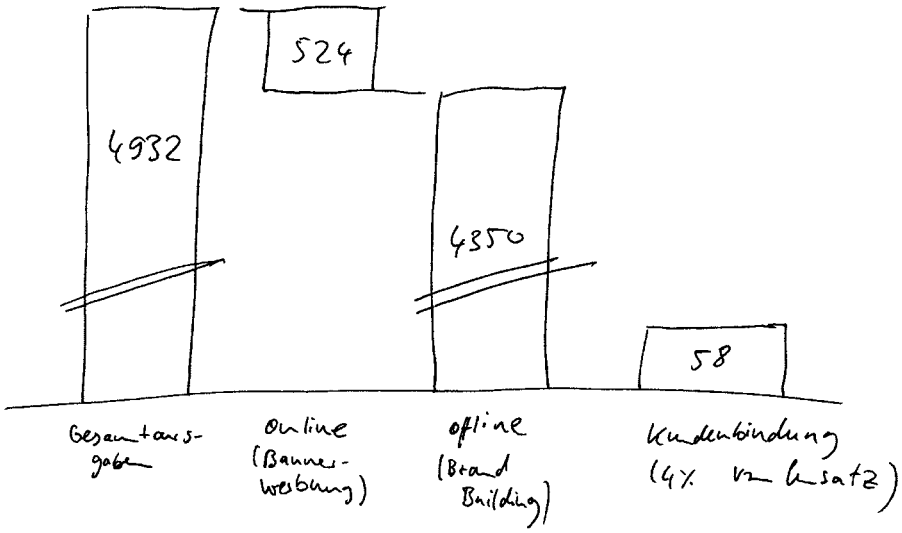
Alteration 47

PPT 01:15
TC 00:19



Creation 48

PPT 04:30
TC 01:36



Alteration 48

PPT 04:02
TC 00:23