P^3 Profitable Product Performance

Target Costing inside

Concept for the Reverse Calculation at MD

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SIEMENS

Introduction

- The purpose of this paper is to **explain the tool of the Reverse Calculation** within the Target Costing methodology.
- The paper is **one of 6 concept papers** in the Target Costing compendium for MD.
- The paper is divided into 3 chapters:
  - The first chapter gives a **methodological overview** of the tool.
  - The second chapter provides a view on how to **customize** the Reverse Calculation to the **specific situation of MD**.
  - The third chapter shows the defined **standard graphs.**

Agenda

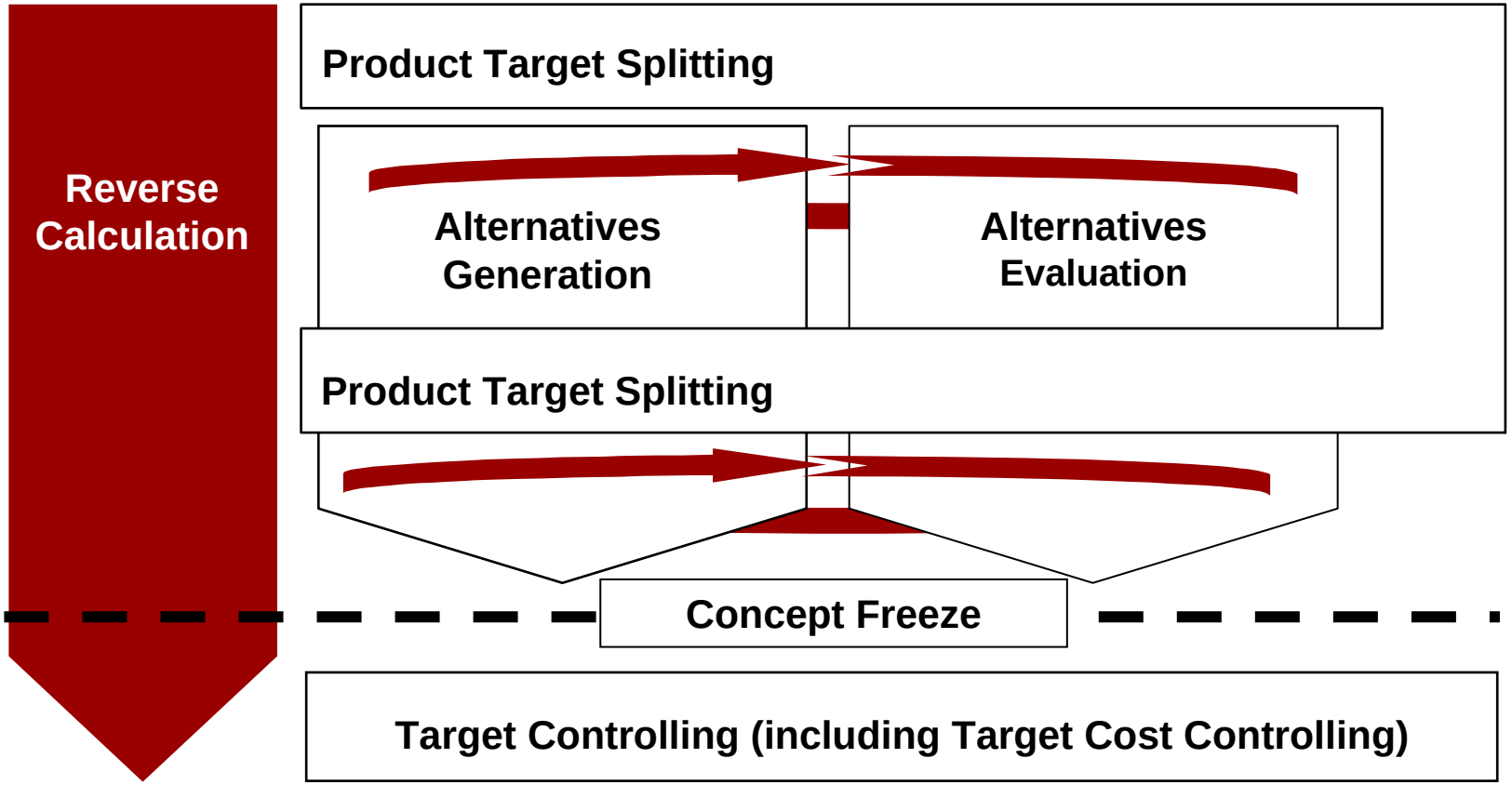
- **Methodology and benefits of the Reverse Calculation**
- The Reverse Calculation at Siemens MD
- Standard graphs at Siemens MD

The Target Costing concept

The Reverse Calculation provides key financial data for all other Target Costing core tools

Market Research

Window of Opportunity and Enthusiasm Model



Definition Reverse Calculation

The Reverse Calculation helps to define cost targets derived from the market

The Reverse Calculation is a tool to allow a **market-oriented product calculation**. Therefore it starts with the relevant market data and profit targets to **derive the Allowable Costs**. This overall cost target is then **split into costs categories** that are structured according to their influenceability.

Benefits of the Reverse Calculation

- The Reverse Calculation supports the change from a cost-oriented price policy to a **market-oriented cost management**.
- Due to it's market orientation the Reverse Calculation offers an **improved acceptance** of management targets.
- The fixation of a necessary Target Profit secures the **commitment to profitability**.
- The Reverse Calculation shows a **transparent cost structure** for a product allowing the **identification of optimization potentials**.
- The Reverse Calculation allows to reveal **possible cost gaps** even at **very early stages** of the product development process and thus **secures the necessary profit orientation**.

Reverse Calculation versus traditional calculation

In comparison to the Cost Plus calculation which uses given product costs to calculate a sales price, the Reverse Calculation calculates allowable product costs based on a given price and volume

Cost Plus calculation
(period-oriented)

Material costs
Material overhead
Direct labor
Production overhead

PRODUCTION COSTS

Development overhead
Administration overhead
Sales overhead

TOTAL COSTS

Profit margin

SALES PRICE

How much will a product cost?
(And how can we transfer the cost to the customer?)

Reverse Calculation
(product lifecycle-related and before start of development)

Target Turnover
./. Target Profit (for each product)

= Allowable Costs

./. Target Overhead

./. Target Product Related Costs

= Target Directly Influenceable Costs

extended to the product lifecycle

What should the product cost?
(And how can we achieve these costs?)

according to: Seidenschwarz, W.: Nie wieder zu teuer!, Stuttgart 1997

The structure of Reverse Calculation

Reverse Calculation structures the Target Cost categories according to their influenceability and calculates a Target Cost Gap

Target Cost categories

Target Turnover ./. Target Profit	
./. Allowable Costs	
./. Target Overhead I	Comprises of costs allocated to the division from corporate functions.
./. Target Overhead II	Comprises of costs related to the division that accrue for processes not directly associated with the product.
./. Product Related Costs	Comprises of those costs that accrue by decisions of the product manager and his team. Cost transparency depends on cost allocation to processes.
= Directly Influenceable Costs	Made up of all costs that can be influenced by the product team if a Target Costing-friendly organizational structure exists.
TARGET COST GAP	
Actual cost projections	Product costs are calculated as if the concept was to be realized under actual conditions.

Reverse Calculation considers lifecycle information

according to: Seidenschwarz, W.; Niemand, S.; Huber, C.: Target Costing: Auf dem Weg zum marktorientierten Unternehmen, in: Franz, K.-P. (Hrsg. 2002): Kostenmanagement, Stuttgart 2002

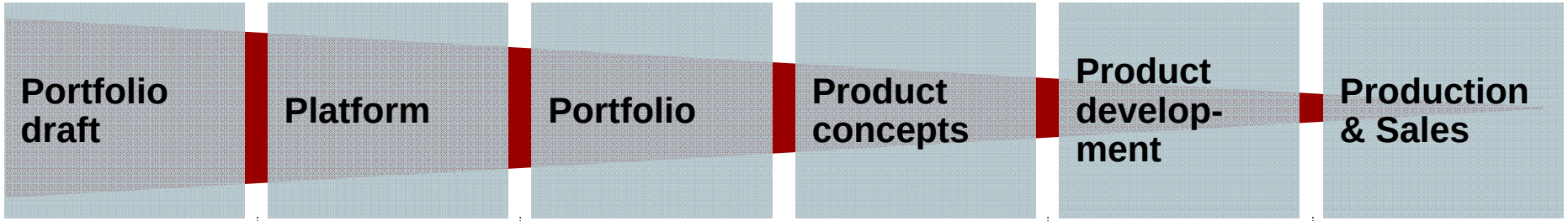
Possible actions to close the Target Cost Gap

To close the Target Cost Gap the product team can influence each category in various ways

	Target Turnover	
./.	**Target Profit**	▪ Clear competitive and regional positioning of the product ▪ Meeting time to market requirements ▪ Active marketing
=	**Allowable Costs**	
./.	**Overhead I**	▪ Not influenceable by Target Costing ▪ Can only be influenced by the corporate functions
./.	**Overhead II**	▪ Process management by the business unit headquarter ▪ Efficiency programs targeting administration process ▪ Subject for mid / long term overhead cost optimization
./.	**Product Related Costs**	▪ Establishment of a process view of the organization including cost drivers ▪ Introduction of process management programs together with product management teams
=	**Directly Influenceable Costs**	
=	**TARGET COST GAP**	
./.	**Actual cost projection**	▪ Changes in production processes and location ▪ Changes in the product/platform concept ▪ Changes in feature sets or technical specifications ▪ Reduction of material costs

Benefits of the Reverse Calculation during the product development process

With the given information the product development process benefits in different ways



- RC determines **Target Cost structures** at **target prices** including:
  - Target BOM
  - Target budgets for functions.
- RC information serves as **plausibility check** for profit targets.

- RC secures **profit focus**.
- RC enables **market orientation** in the allocation of resources for defined platform concepts by determining the **Target Costs** for segments.

- RC supports the Alternatives Evaluation by calculating the Target Cost Gap as **evaluation criteria** and is used as **input** for Product Target Splitting.
- Possible **profit scenarios** for different alternatives can be calculated.

- RC permanently controls the **Target Achievement** by checking cost positions and profitability.

- RC provides a review if the defined profit and cost targets are achieved.

Agenda

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- **The Reverse Calculation at Siemens MD**
- Standard graphs at Siemens MD

Actual MD Business Case

The Reverse Calculation is based on the existing Business Case structure

Business Case tool structure

Units
Units cumulated
Turn Over
Turn Over per unit
Manufacturing Costs
Manufacturing Costs per Unit
Sales Margin
Sales Margin %
Sales Margin per Unit
COGS
COGS %
COGS per Unit
Gross Margin
Gross Margin %
Gross Margin per unit
Overhead
Overhead %
Overhead per unit

EBIT
EBIT Cumulated
EBIT%
EBIT per unit

The MD calculation starts with market derived targets (price, volume and EBIT targets).

Costs are mainly directly budgeted (around 90% of all costs)
For all remaining cost categories the turnover is used as an overhead rate base.

These preconditions are taken into account for the design of the MD Reverse Calculation to align both, Business Case Tool and MD Reverse Calculation.

In addition to the Business Case Tool the MD Reverse Calculation structures costs according to their ability to be influenced and calculates a Target Cost Gap.

Transition of the Business Case to the Reverse Calculation

By rearranging the cost categories and considering a Target Profit, the Reverse Calculation provides a clear cost reduction target

Business Case tool structure

Units	2.000.000
Units cumulated	2.000.000
Turn Over	200.000.000
Turn Over per unit	100,00
Manufacturing Costs	130.000.000
Manufacturing Costs per Unit	65,00
Sales Margin	70.000.000
Sales Margin %	35,00%
Sales Margin per Unit	35,00
COGS	14.000.000
Other COGS	2.000.000
SCM Costs	4.000.000
Service Costs	8.000.000
COGS %	7,00%
COGS per Unit	7,00
Gross Margin	56.000.000
Gross Margin %	28,00%
Gross Margin per unit	28,00
Overhead	45.600.000
Administration	2.600.000
Development (direct)	7.000.000
Development (indirect)	6.000.000
Marketing (direct)	10.000.000
Marketing (indirect)	8.000.000
Selling Expenses	12.000.000
Overhead %	22,80%
Overhead per unit	22,80
EBIT	10.400.000
EBIT Cumulated	10.400.000
EBIT%	5,20%
EBIT per unit	5,20

MD Reverse Calculation

Units	2.000.000
Target Turnover	200.000.000
Price (average)	100
Target Profit Total	15.000.000
Allowable Costs	185.000.000
Overhead I	2.600.000
Administration	2.600.000
Overhead II	32.000.000
Development (indirect)	6.000.000
Marketing (indirect)	8.000.000
Selling Expense	12.000.000
SCM Costs	4.000.000
Other COGS	2.000.000
Directly Influenceable Costs (DIC)	150.400.000
Product Related Costs (PRC)	25.000.000
Development (direct)	7.000.000
Marketing (direct)	10.000.000
Service Costs	8.000.000
Manufacturing Costs per unit	65,00
BOM per unit	50,00
Variant Adder per unit	0,00
CC per unit	10,00
Licences per unit	5,00
Target Cost Gap	-4.600.000
Target Cost Gap per unit	-2,30
EBIT (for comparison purpose)	10.400.000

Possible actions to close the Target Cost Gap at MD

To close the Target Cost Gap the MD product team should focus on Product Related Costs and Manufacturing Costs

	Target Turnover	▪ With an efficient time to market and lifecycle management the product teams can influence volume developments and the price erosion of a product with the help of Marketing and Sales.
./.	**Target Profit**	
=	**Allowable Costs**	
./.	**Overhead I**	
./.	**Overhead II**	▪ MP management can influence the OH II costs by infrastructural changes (e.g. reorganization of global sales structures)
=	**Directly Influenceable Costs**	▪ **Direct R&D** costs can be influenced by the technical product concept (e.g. reuse of components) ▪ **Service costs** can be influenced by the product specifications & warranty ▪ **Marketing costs** can be influenced by the advertising approach
./.	**Product Related Costs (PRC)**	
./.	**Manufacturing Costs** Bill of Material (BOM) Conversion Costs (CC) Licenses Costs	▪ **BOM** can be influenced by component specifications (e.g. display brilliance guarantee) ▪ **Conversion Costs** can be influenced by the product construction concept (e.g. number of components) ▪ **Licenses** can be influenced by feature changes or own developments
=	**TARGET COST GAPS**	

Reverse Calculation for Target BOM I

Additional to the calculation of the Target Cost Gap the Target BOM can be calculated

- In the **early phases** of the product development processes **a BOM estimation is not available**. Thus the Target Cost Gap can **not** be calculated.
- Therefore a **Target BOM** is calculated as a **first estimate on material costs** for the development process. The Target BOM reflects the **maximum available amount for material costs.**
- To calculate the Target BOM, prices, volumes, Overhead Costs and Product Related Costs are market derived or base on MD business planning.
- The Target BOM is also used in later phases of the product development process
  - In the **later phases** of the product development process the Target BOM is used as **target value for cost reductions**.
  - The Target BOM is used in **all phases** as an **input for the Product Target Splitting** to calculate target component costs.
- To **reach the Target BOM**, the product development team can **influence** the **Product Related Costs** and the actual **BOM** (prices and volumes are market derived and Overhead costs are already planned including targeted cost reductions).

Reverse Calculation for Target BOM II

The Target BOM is calculated by setting the Target Cost Gap to zero

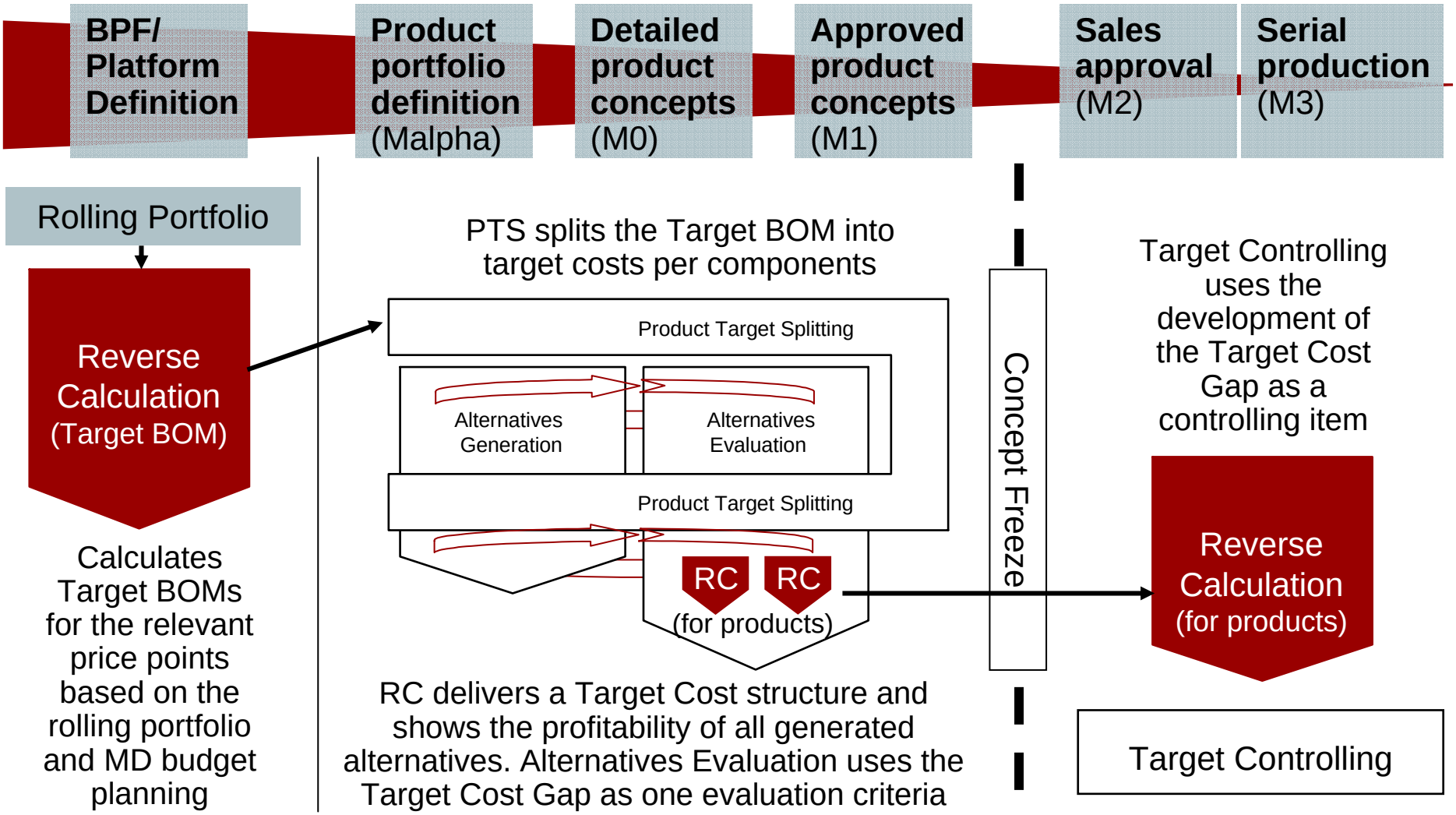
Target BOM ⟷ Reverse Calculation ⟷ Target Cost Gap

	2.000.000	Units	2.000.000
	200.000.000	Target Turnover	200.000.000
	100	Price (average)	100
./.	15.000.000	Target Profit Total	15.000.000
=	185.000.000	Allowable Costs	185.000.000
	2.600.000	Overhead I	2.600.000
	2.600.000	Administration	2.600.000
	32.000.000	Overhead II	32.000.000
	6.000.000	Development (indirect)	6.000.000
	8.000.000	Marketing (indirect)	8.000.000
	12.000.000	Selling Expense	12.000.000
	4.000.000	SCM Costs	4.000.000
./.	2.000.000	Other COGS	2.000.000
	150.400.000	Directly Influenceable Costs (DIC)	150.400.000
	25.000.000	Product Related Costs (PRC)	25.000.000
	7.000.000	Development (direct)	7.000.000
	10.000.000	Marketing (direct)	10.000.000
	8.000.000	Service Costs	8.000.000
	62,70	Manufacturing Costs per unit	65,00
=	48,08	BOM per unit	50,00
	0,00	Variant Adder per unit	0,00
	9,62	CC per unit	10,00
./.	5,00	Licences per unit	5,00
	0	Target Cost Gap	-4.600.000 =
	0,00	Target Cost Gap per unit	-2,30
	15.000.000	EBIT (for comparison purpose)	10.400.000

- The **same calculation scheme** and cost positions are used.
- The **target value** changes from the Target Cost Gap to the **(Target) BOM**.
- The **Target Cost Gap** is set to **zero** (the point where the product reaches exactly its Target Profit).

The role of the Reverse Calculation during the product development process

With the Target BOM and the Target Cost Gap the Reverse Calculation supports all phases of the product development process in various ways



Management Templates of the Reverse Calculation I

The first management template shows the deviations between the original targets out of the Target BOM calculation and the actual status of the Reverse Calculation

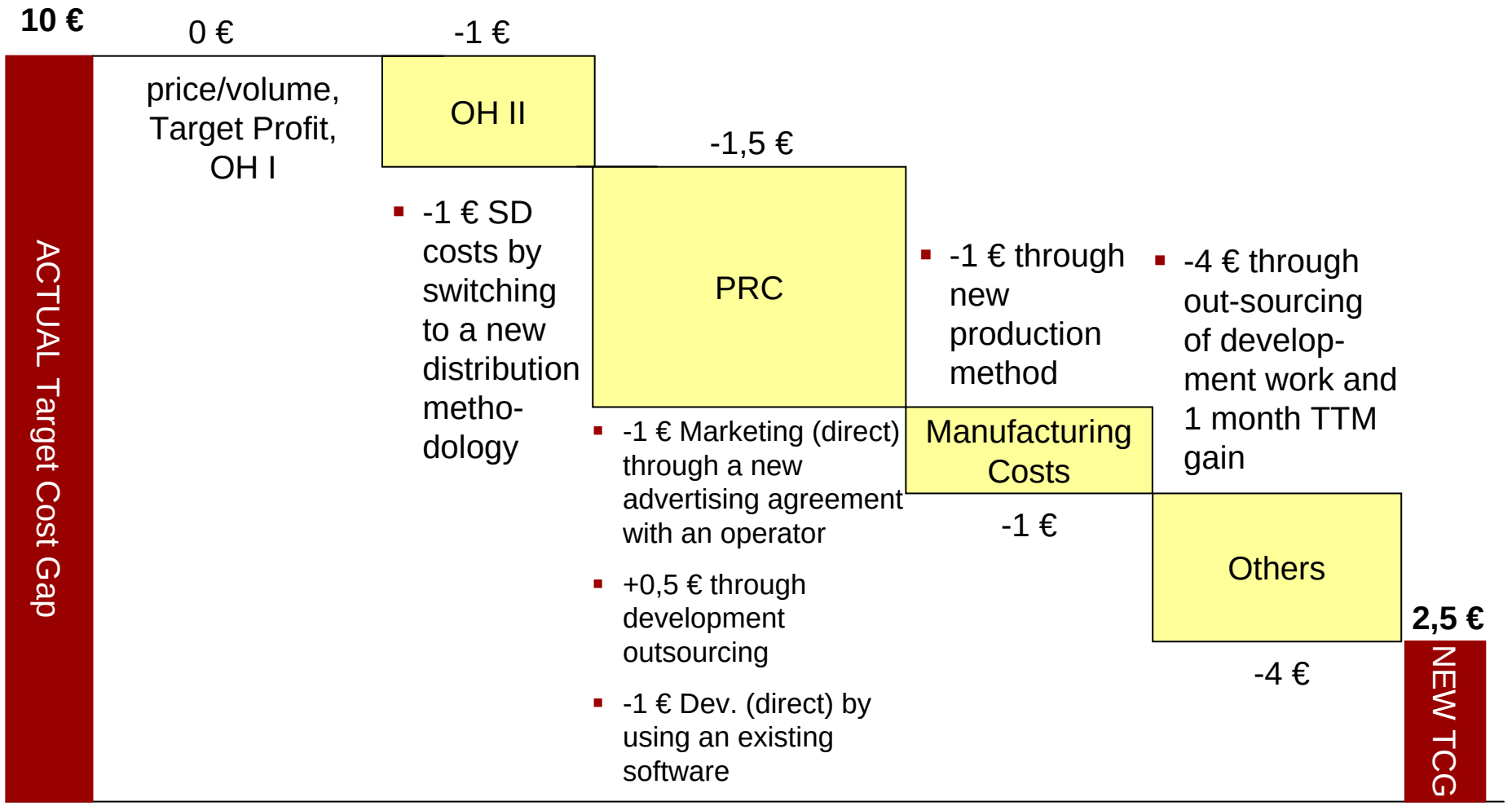
	Target BOM Reverse Calculation	M1 Reverse Calculation	M3 Reverse Calculation	Actual	Life-Cycle to Date
Life Cycle (months)	**13**			**13**	
Units	3.500.000			3.500.000	
Target Turnover *ASP*	603.000.000 *172,29*			603.000.000 *172,29*	
Target Profit Total	45.225.000			45.225.000	
Allowable Costs	557.775.000			557.775.000	
Overhead I *Administration*	7.839.000 *7.839.000*			7.839.000 *7.839.000*	
Overhead II *Development (indirect)* *Marketing (indirect)* *Selling Expense* *SCM Costs* *Other COGS*	83.376.500 *7.700.000* *24.662.700* *28.160.100* *16.642.800* *6.210.900*			83.376.500 *7.700.000* *24.662.700* *28.160.100* *16.642.800* *6.210.900*	
Directly Influenceable Costs	466.559.500			466.559.500	
Product Related Costs *Development (direct)* *Marketing (direct)* *Service Costs*	30.870.000 *7.000.000* *8.575.000* *15.295.000*			30.870.000 *7.000.000* *8.575.000* *15.295.000*	
Manufacturing Costs per unit *thereof (Target) BOM*	120,36 *99,49*			120,36 *95,56*	
Target Cost Gap *per unit*	0 *0,00*			14.437.900 *4,13*	
EBIT	45.225.000			59.662.900	

Deviation Analysis

- The actual Reverse Calculation can not yet meet the set targets.
- The deviation in the Target Cost Gap has to be closed by the product team.

Management Templates of the Reverse Calculation II

The second management template shows the measure taken to close the deviations and the respective Target Cost Gap shown in the first management template



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Management Templates of the Reverse Calculation II

The third template shows six standard simulations

Reverse Calculation - Standard Simulations -	Base Case Finch Music	TCG = 0	EBIT = 0	Hist. ASP 0 €	TTM delay 1 month	Volume -10%	Volume +10%	Volume -30%	Volume +30%
	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total	Lifecycle Total
Units	**2.285.000**	**2.285.000**	**2.285.000**	**2.285.000**	**1.985.000**	**2.056.500**	**2.513.500**	**1.599.500**	**2.970.500**
Target Turnover	**173.350.000**	**181.787.606**	**173.823.198**	**0**	**155.350.000**	**156.015.000**	**190.685.000**	**121.345.000**	**225.355.000**
Price (average)	**75,86**	**79,56**	**76,07**	**0,00**	**78,26**	**75,86**	**75,86**	**75,86**	**75,86**
Target Profit Total 4,0%	**6.934.000**	**7.271.504**	**6.952.928**	**0**	**6.214.000**	**6.240.600**	**7.627.400**	**4.853.800**	**9.014.200**
Allowable Costs	**166.416.000**	**174.516.102**	**166.870.270**	**0**	**149.136.000**	**149.774.400**	**183.057.600**	**116.491.200**	**216.340.800**
Overhead I	**2.080.200**	**2.181.451**	**2.085.878**	**0**	**1.864.200**	**1.872.180**	**2.288.220**	**1.456.140**	**2.704.260**
Administration	2.080.200	2.181.451	2.085.878	0	1.864.200	1.872.180	2.288.220	1.456.140	2.704.260
Overhead II	**20.051.250**	**20.684.070**	**20.086.740**	**7.050.000**	**18.701.250**	**18.751.125**	**21.351.375**	**16.150.875**	**23.951.625**
Development (indirect)	7.050.000	7.050.000	7.050.000	7.050.000	7.050.000	7.050.000	7.050.000	7.050.000	7.050.000
Marketing (Pull + SF)	2.080.200	2.181.451	2.085.878	0	1.864.200	1.872.180	2.288.220	1.456.140	2.704.260
Selling Expense	5.200.500	5.453.628	5.214.696	0	4.660.500	4.680.450	5.720.550	3.640.350	6.760.650
SCM Costs	3.467.000	3.635.752	3.476.464	0	3.107.000	3.120.300	3.813.700	2.426.900	4.507.100
Other COGS	2.253.550	2.363.239	2.259.702	0	2.019.550	2.028.195	2.478.905	1.577.485	2.929.615
Directly Influenceable Costs (DIC)	**144.284.550**	**151.650.580**	**144.697.652**	**-7.050.000**	**128.570.550**	**129.151.095**	**159.418.005**	**98.884.185**	**189.684.915**
Product Related Costs (PRC)	**20.082.600**	**20.082.600**	**20.082.600**	**20.082.600**	**18.430.618**	**18.824.340**	**21.340.860**	**16.307.820**	**23.857.380**
Development (direct)	7.500.000	7.500.000	7.500.000	7.500.000	7.500.000	7.500.000	7.500.000	7.500.000	7.500.000
Marketing (Push + HQ)	6.342.000	6.342.000	6.342.000	6.342.000	5.509.352	5.707.800	6.976.200	4.439.400	8.244.600
Service Costs	6.240.600	6.240.600	6.240.600	6.240.600	5.421.265	5.616.540	6.864.660	4.368.420	8.112.780
Manufacturing Costs	**131.567.980**	**131.567.980**	**131.567.980**	**131.567.980**	**114.294.285**	**118.411.182**	**144.724.778**	**92.097.586**	**171.038.374**
Manufacturing Costs per unit	**57,58**	**57,58**	**57,58**	**57,58**	**57,58**	**57,58**	**57,58**	**57,58**	**57,58**
BOM per unit	52,79	52,79	52,79	52,79	52,79	52,79	52,79	52,79	52,79
Variant Adder per unit	0,63	0,63	0,63	0,63	0,63	0,63	0,63	0,63	0,63
CC per unit	4,16	4,16	4,16	4,16	4,16	4,16	4,16	4,16	4,16
Licences per unit	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Target Cost Gap	**-7.366.030**	**0**	**-6.952.928**	**-158.700.580**	**-4.154.352**	**-8.084.427**	**-6.647.633**	**-9.521.221**	**-5.210.839**
Target Cost Gap per unit	**-3,22**	**0,00**	**-3,04**	**-69,45**	**-2,09**	**-3,93**	**-2,64**	**-5,95**	**-1,75**
EBIT (for comparison purpose)	**-432.030**	**7.271.504**	**0**	**-158.700.580**	**2.059.648**	**-1.843.827**	**979.767**	**-4.667.421**	**3.803.361**
EBIT in % of T/O	**-0,25%**	**4,00%**	**0,00%**	**0,00%**	**1,33%**	**-1,18%**	**0,51%**	**-3,85%**	**1,69%**

Standard graphs for the Reverse Calculation

The second management template shows the measure taken to close the deviations and the respective Target Cost Gap shown in the first management template