Information Supply

Session 4

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Glossary

BSC	Balanced Scorecard
EVA	Economic Value Added
KPI	Key Performance Indicator
MA	Management Accounting
OKR	Objectives and Key Results
PMS	Performance Measurement System
ROCE	Return on Capital Employed
ROIC	Return on Invested Capital
VBM	Value Based Management

Agenda

I. **Overview of this session**

II. **Key Performance Indicators (KPIs)**

   i. Foundations to KPI use

   ii. Creative KPI formulation

   iii. Limits of KPI analysis

III. **Performance Measurement Systems (PMIs)**

   i. Overview of definitions, characteristics and purposes of PMIs

   ii. Financial Performance Measurement Systems

   iii. Hybrid Performance Measurement Systems

IV. **Concluding Remarks**

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I. Session Overview

Definition and use of KPIs and performance measurement systems

Key Performance Indicator (KPI): a measurable value as a basis for analysis and evaluation of and organizational fact

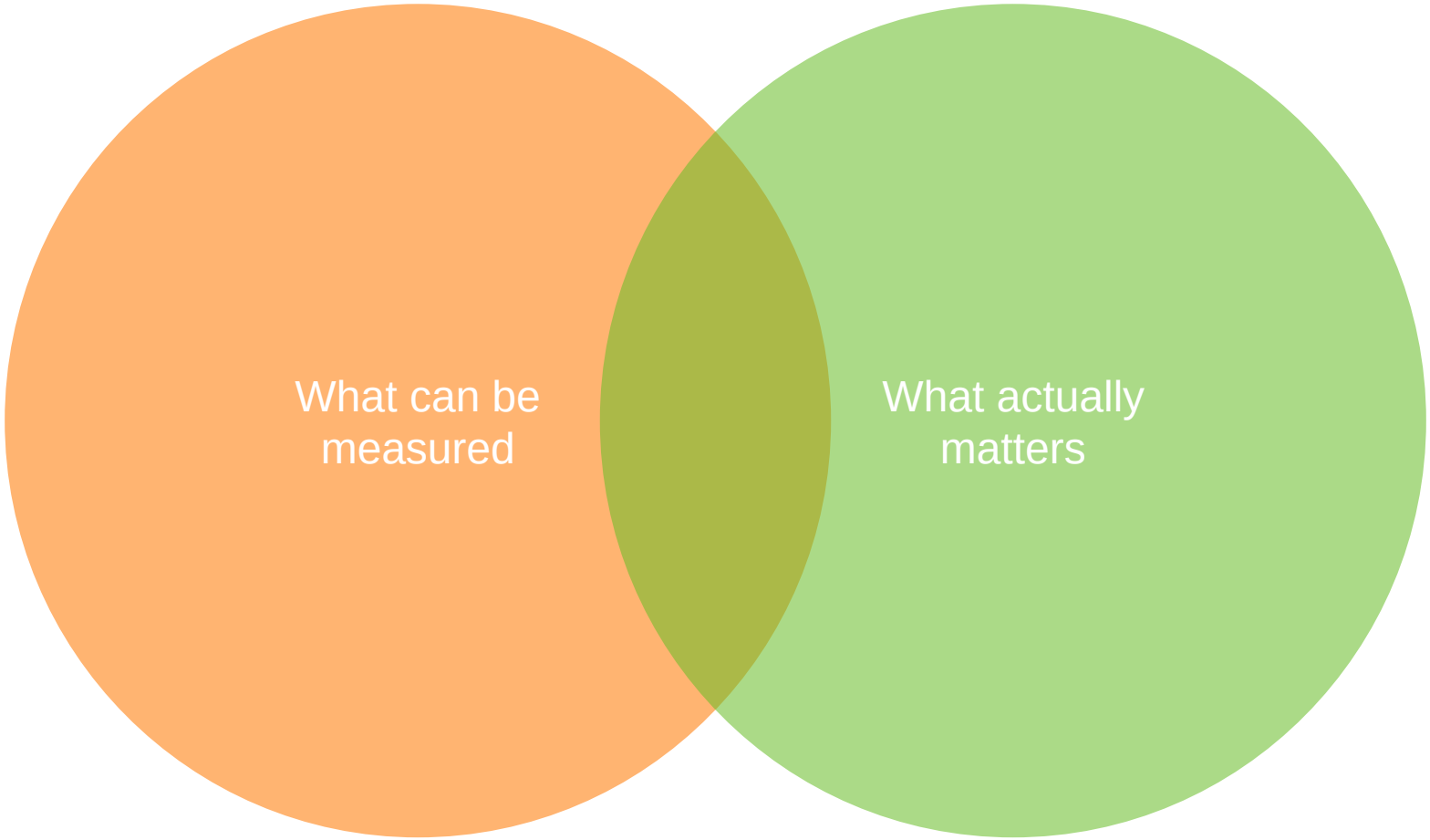
Performance Measurement System (PMS): A set of KPIs combined with the goal of achieving certain outcomes (e.g., initiatives)

KPIs and PMS present the **basis for effective Management Accounting**

- Reports often build on a set of logically structured KPIs
- KPIs are the basis for strategic and operational planning, performance improvement and control

Source: Behn (2003)

Measure with reason!



Source: van der Kolk (2021) Managerial Accounting

II. Key Performance Indicators (KPIs)

i. Foundations to KPI use
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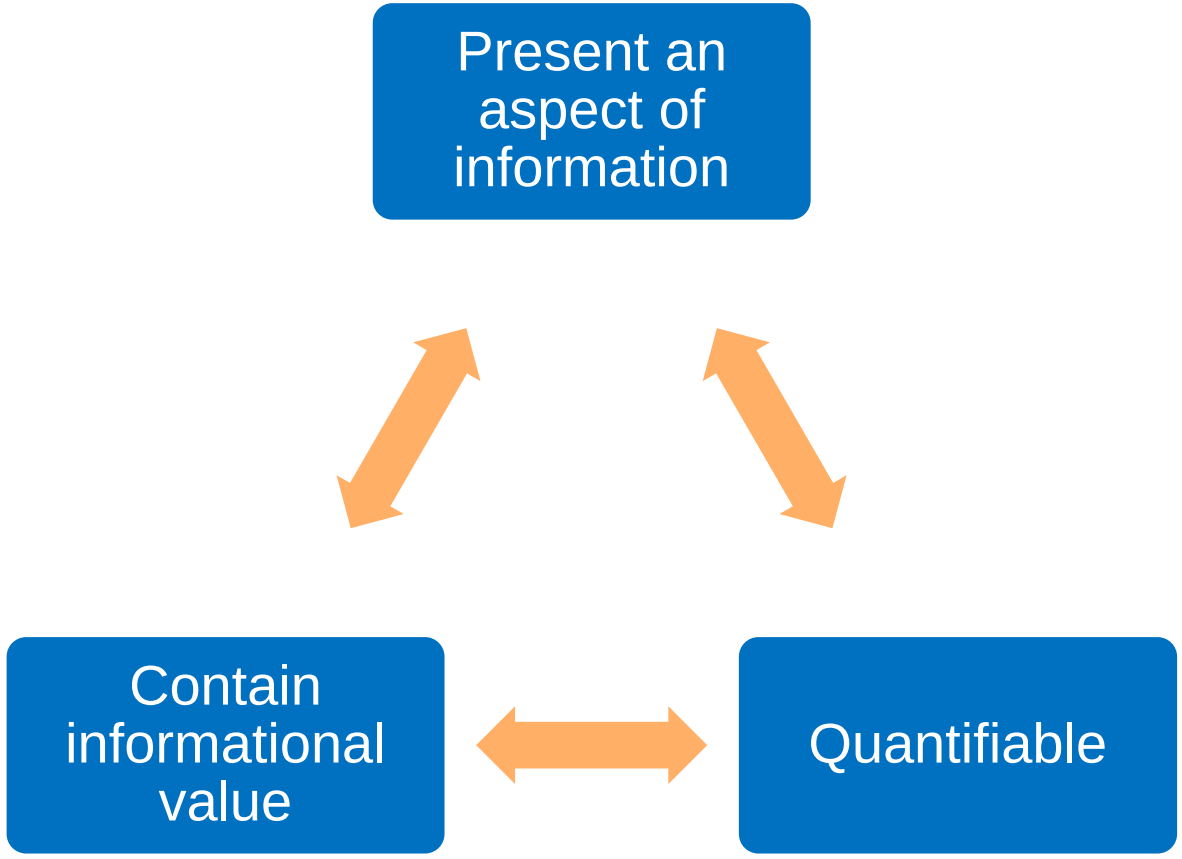
KPIs need to:



What are three advantages for why you should be using KPIs?

Categories of and relationships between KPIs

- **Categories of KPIs**:
  - Absolute figures (e.g., profit, equity value)
  - Relative figures
    - Relational figures (e.g., profitability)
    - Categorical figures (e.g., material costs, fixed costs)
    - Indexed figures (e.g., wage index)
- **Relationships between KPIs**:
  - Logical:
    - of definition
    - mathematical
  - Empirical:
    - Deterministic
    - statistical
  - Hierarchical:
    - matter-of-factly
    - subjective
- **Business oriented KPIs**
  - Leading vs. lagging
  - Local vs. global
  - Financial vs. non-financial

Source: Küpper et al (2013), Weber/Schäffer (2021)

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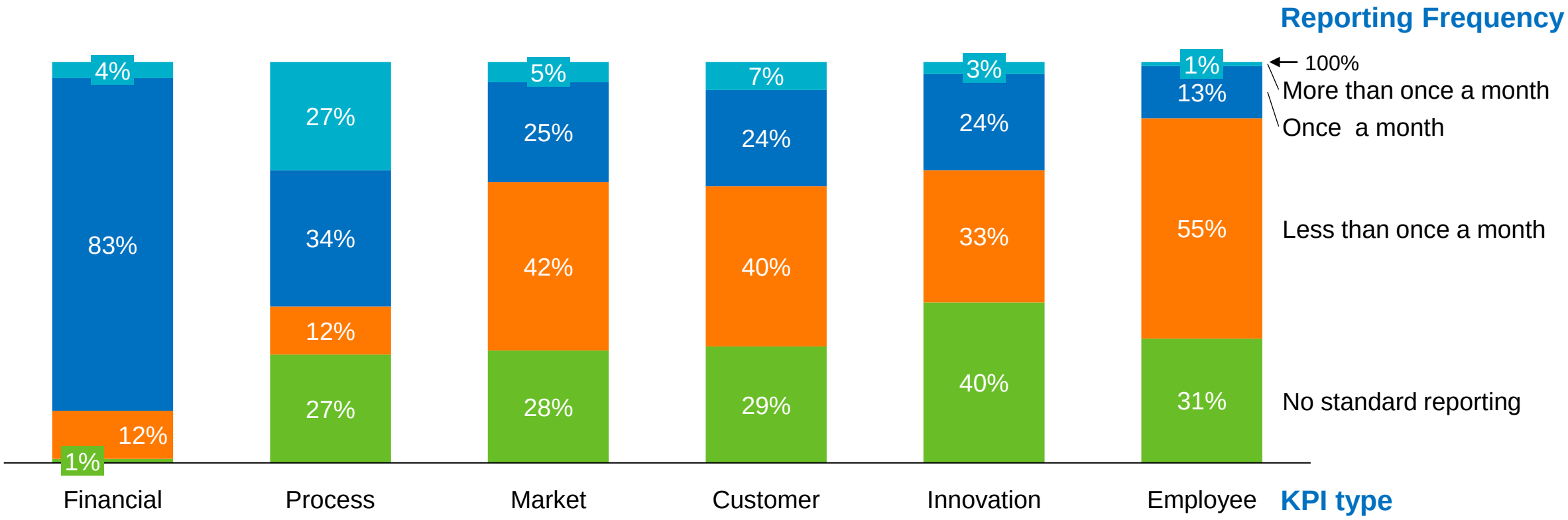
KPIs regularly provided to Managers by KPI topic



Source: Schäffer/Weber (2016)
Managerial Accounting

KPIs can be defined for different business areas - Examples [1/2]

- **Financial KPIs**
  - Return on Investment [%]: Success/Invested Capital x 100
  - Contribution margin [EURO]: revenue − individual costs − variable costs
  - Capital turnover: turnover/invested capital
- **Market and customer oriented KPIs**
  - Market share [%]: Turnover/sales volume total market x 100
  - Degree of cost pass-on [%]: price increase/cost increase x 100
  - Customer acquisition rate [%]: number of new customers/number of old customers x 100
- **Process-related (e.g., production) KPIs**
  - Error rate [%]: scrap of the period/production volume of the period x 100
  - Capacity utilization [%]: actual machine runtime/possible machine runtime x 100
  - Manufacturing Cycle Effectiveness: throughput time = processing time + inspection time + transport time + waiting or storage time)

Source: Weber/Schäffer (2021)

KPIs can be defined for different business areas - Examples [2/2]

- **HR-focused KPIs**
  - Sick leave [%]: number of days lost due to illness/annual amount x 100
  - Fluctuation rate [%]: Employees eliminated per period/Average number of employees x 100
  - Employee productivity [EURO]: success/average number of employees Capital turnover: turnover/invested capital
- **Innovation-focused KPIs**
  - Innovation rate [%]: turnover with newly launched products/total turnover x 100
  - Research intensity [%]: R&D expenditure/turnover x 100
  - Suggestion rate: Number of suggestions for improvement/number of employees

Source: Weber/Schäffer (2021)

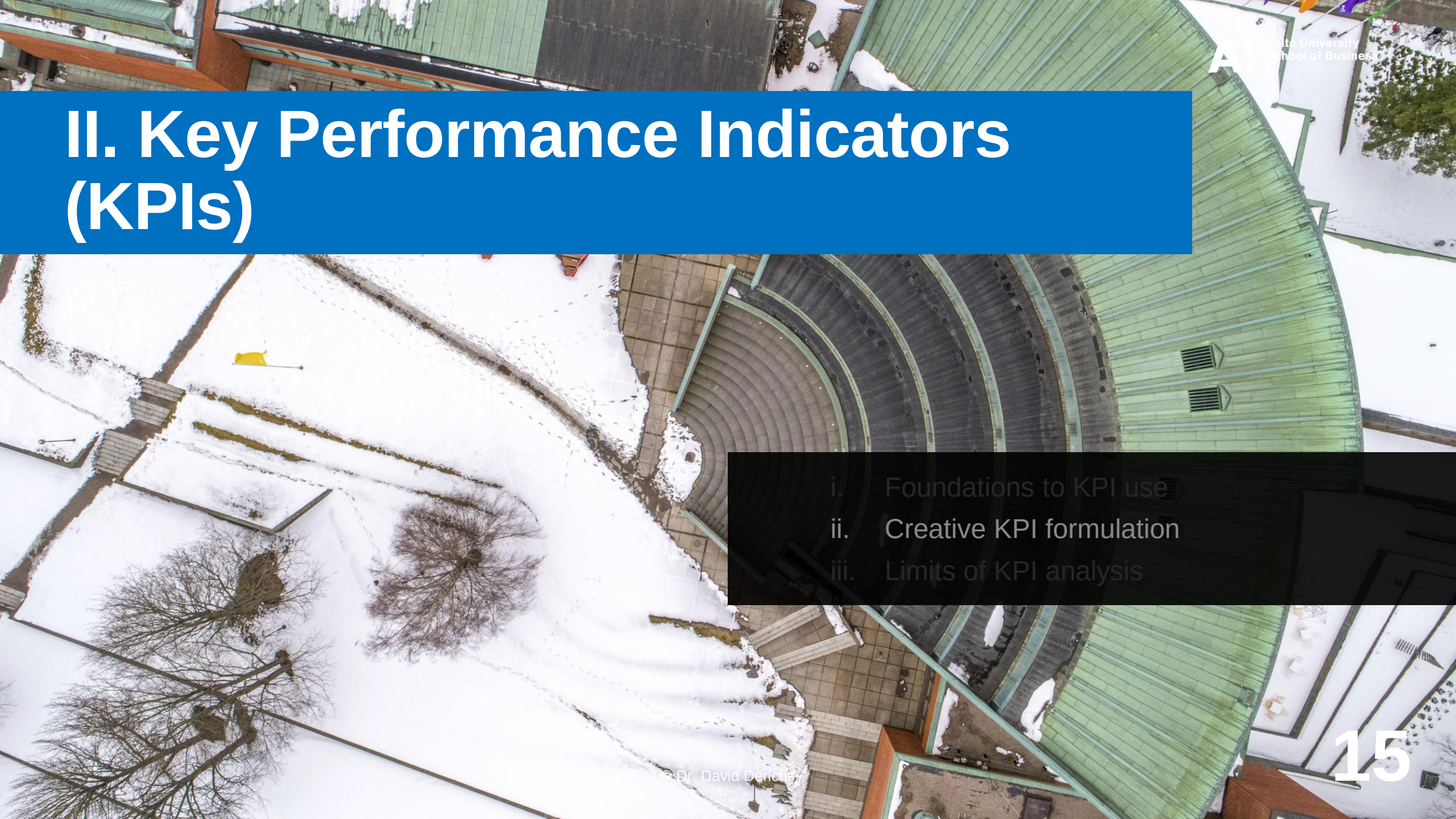
Tasks and purposes of KPIs

- **Excitation**
- **Operationalization**
- **Goal setting**
- **Steering**
- **Planning and control**

Preconditions for effective KPI development:

- Advanced accounting system
- Right selection
- Degree of relatedness between KPIs
- Correct determination (Reliability)
- Relevance
- Quality of Analysis

Source: Küpper et al (2013), Weber/Schäffer (2021)



II. Key Performance Indicators (KPIs)

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The basis to creative KPI analysis is financial statement analysis

- In general, a creative KPI is an indicator that is a modified version of a basic/common KPI
- Basic goal is to achieve comparability between different organizational units or companies

The financial statement analyst tries to accommodate specificities of the analyzed asset

Neutralizing certain accounting policies / earning management
e.g., adjustments for accruals

To accommodate the economic character of specific financial statement positions
e.g., operating vs. financing leases

- Creative KPI formulation is core to management accounting practice

Source: Petersen/Plenborg (2011)

A practical example of creating and using creative KPIs [1/2]

- Brain teaser and market sizing questions during job interviews:
  - How much revenue is produced in the Helsinki taxi industry in a single day?
  - How much money is lying on the seabed of the Helsinki habour basin?
  - Your organization plans to build an e vehicle charging station network along all highways in Finland – How high should the investment be?

- Example from business – fashion boutique:

Revenues (1)	5000000
COGS (2)	1000000
Gross Profit	**4000000**
Other costs (3)	3000000
Net income	**1000000**

Additional information: A comparable business has a gross profit of 85% and an overall profitability of 25%.

What questions could we ask to dig deeper?

A practical example of creating and using creative KPIs [1/2]

(1) Revenues
- Sales volume analysis
- Price analysis
- Price vs. list price
- Sales force productivity
- Customer mix

(2) COGS
- How high are returns?
- Split of products according to their gross margin and analysis of the mix thereof

(3) Other costs
- Step-wise fixed cost coverage calculation
- Break even analysis

→ By just looking at few KPIs one can identify a large list of potential underlying problems!

Creative KPIs as foundation for comparisons

- **Standard KPIs** from literature (the course book) function as a **good starting point**!
- **Adjustments need to be performed** (almost always) to adjust those figures to company specific circumstances
  → e.g., calculating the Economic Value added (EVA) can entail up to 160 adjustments to the basic accounting figures!

- **Comparison** as a necessity to **make sense** of a given **KPI**!
  - Time series comparison
  - Cross sectional comparison
  - Benchmarking
  - Variance analysis

II. Key Performance Indicators (KPIs)

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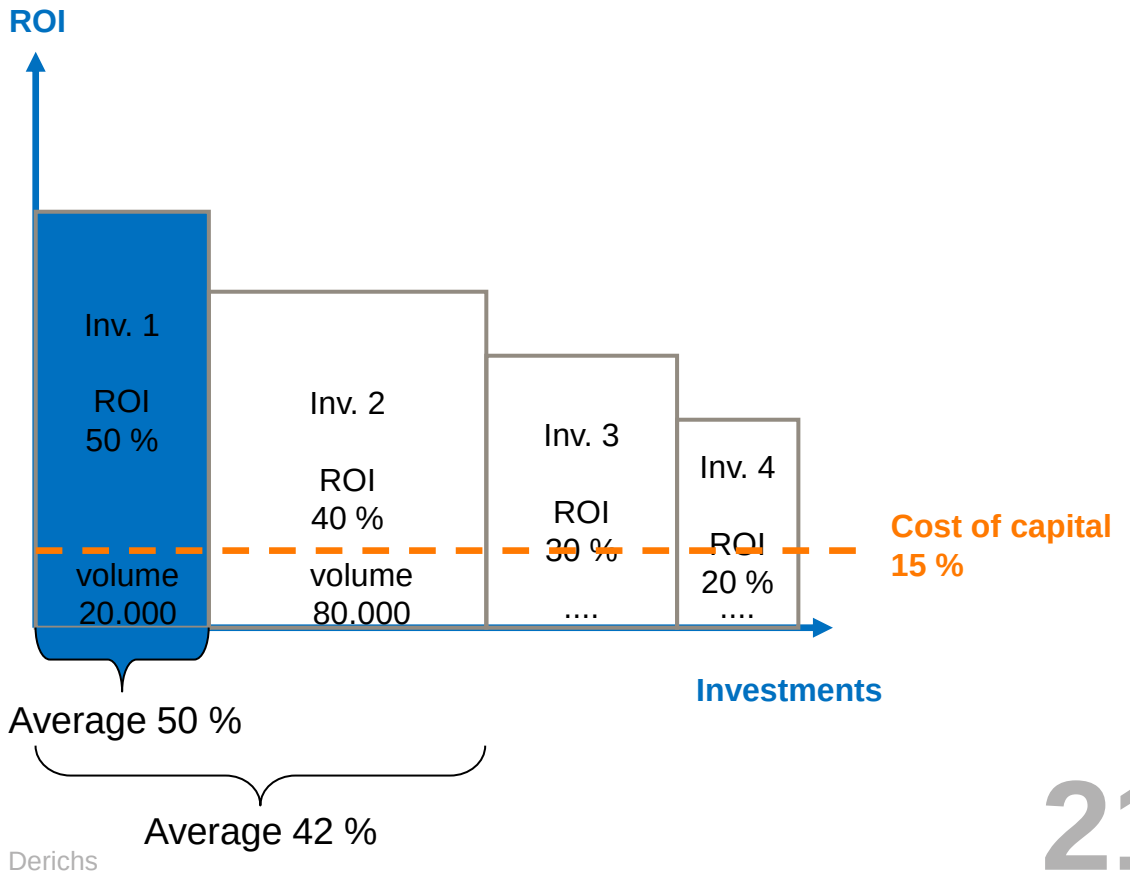
Application of KPI is not trivial – Example of manager remuneration [1/2]

ROI-based manager remuneration

- Compensation scheme:
  Fixed salary + bonus x (1+ROI)

- Example:
  100000 + 20000 x (1+ROI)

→ ROI leads to under investment!



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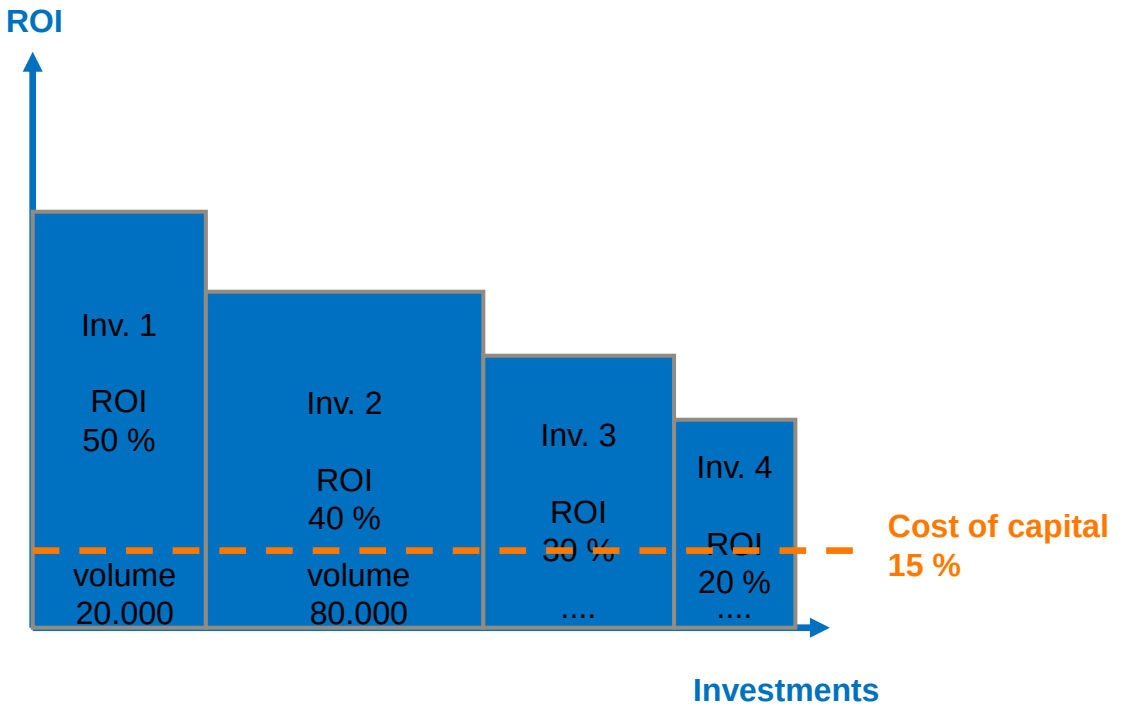
Application of KPI is not trivial – Example of manager remuneration [2/2]

Cost of capital-based manager remuneration

- Compensation scheme:
  Fixed salary + Economic profit x (10%)

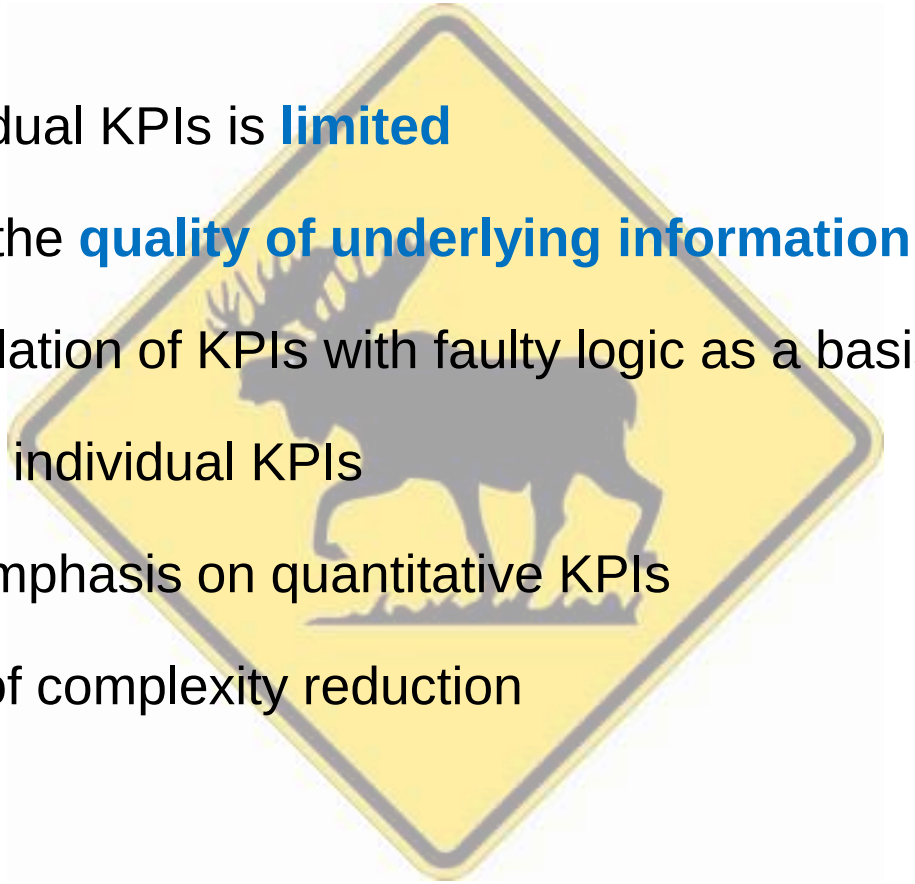
- Example:
  100000 + (50%-15%) x 20000 x 10%
  + (40%-15%) x 80000 x 10%
  + … + xxx



→ **Optimal resource allocation from company perspetive**

Limits of individual KPIs suggest use of performance measurement systems

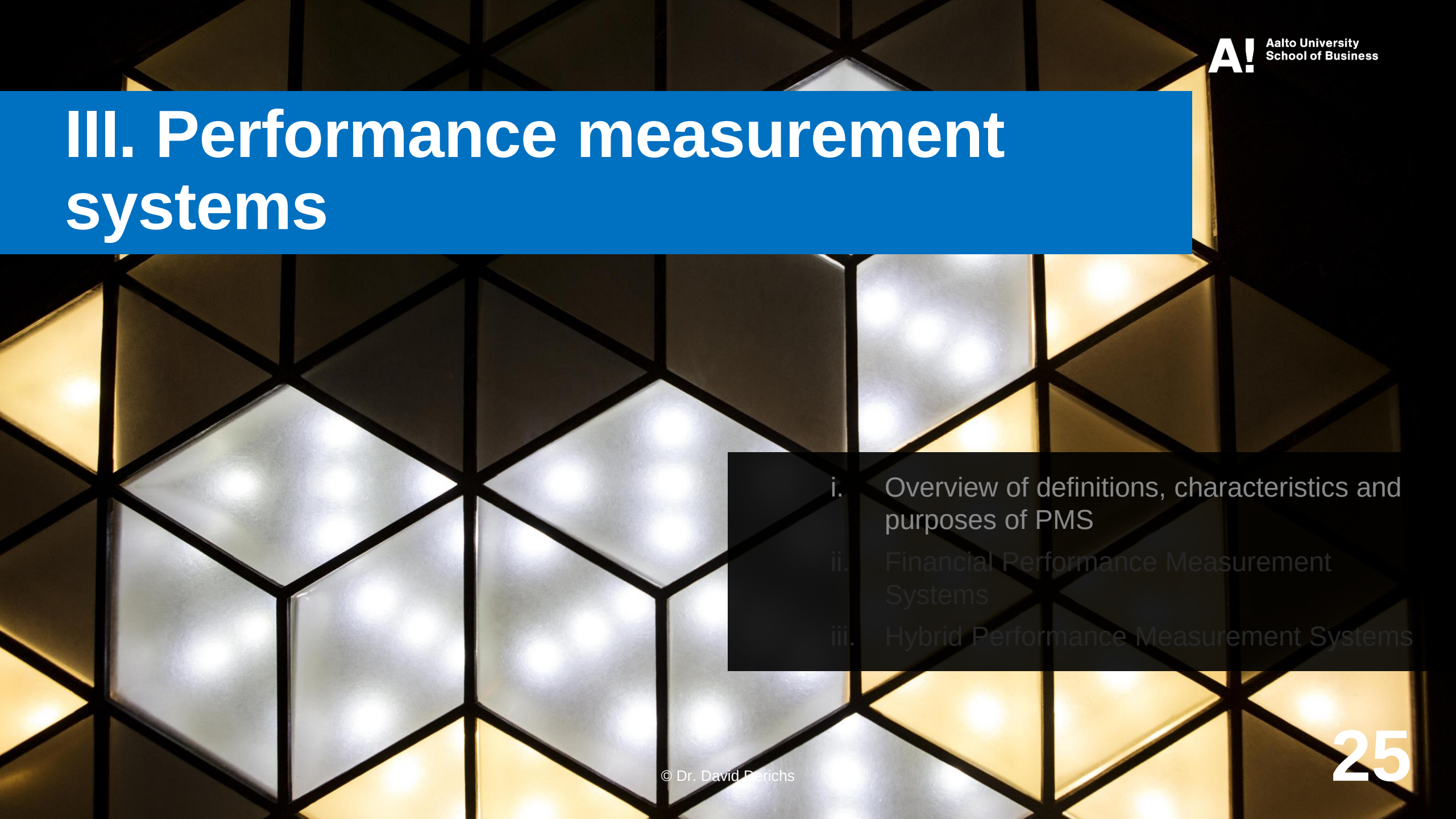
- **Informational value** of individual KPIs is **limited**
- **KPI usefulness** depends on the **quality of underlying information**
- **Risk of "too creative"** formulation of KPIs with faulty logic as a basis
- **Inadequate interpretation** of individual KPIs
- **Missing information** / overemphasis on quantitative KPIs
- **Opportunistic exploitation** of complexity reduction



III. Performance measurement systems

i. Overview of definitions, characteristics and purposes of PMS

ii. Hybrid Performance Measurement Systems



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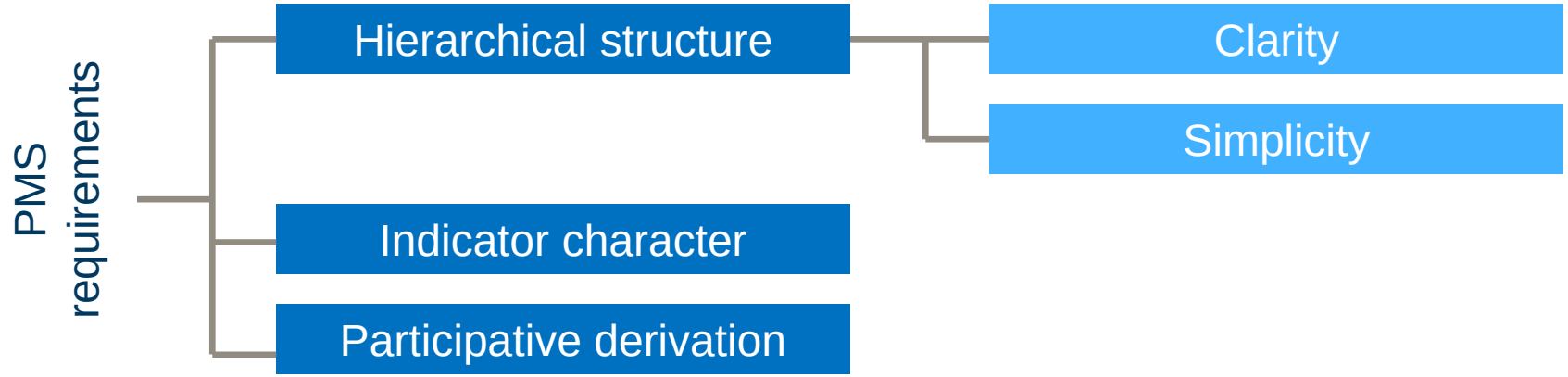
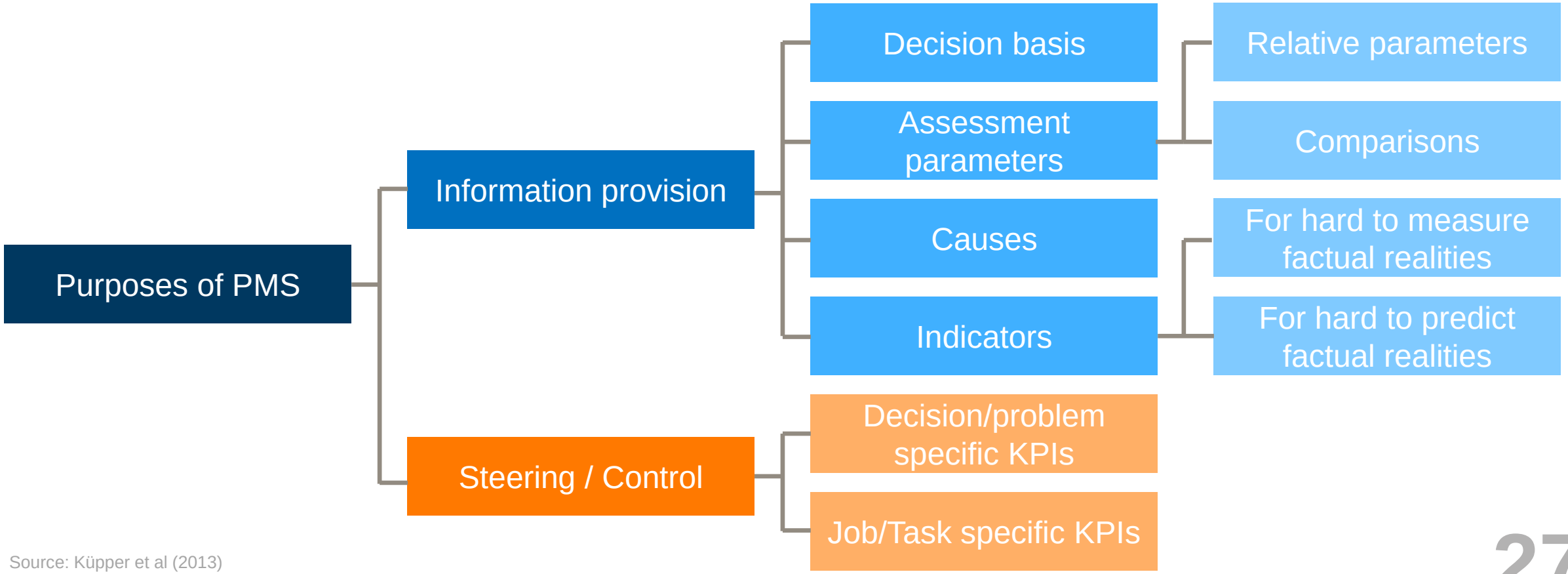
Definition and requirements of a performance measurement system (PMS)

- A **PMS** presents an **ordered** and **holistic combination of KPIs**, which are related to each other and strive to inform holistically about an economic reality
- Different types of **KPIs** (**financial** and **non-financial**) are combined to increase the **informational value** over an economic reality. Information is structured and hence easily digestible
- PMS offer information over the **causes** and **effects of changes** in certain KPIs



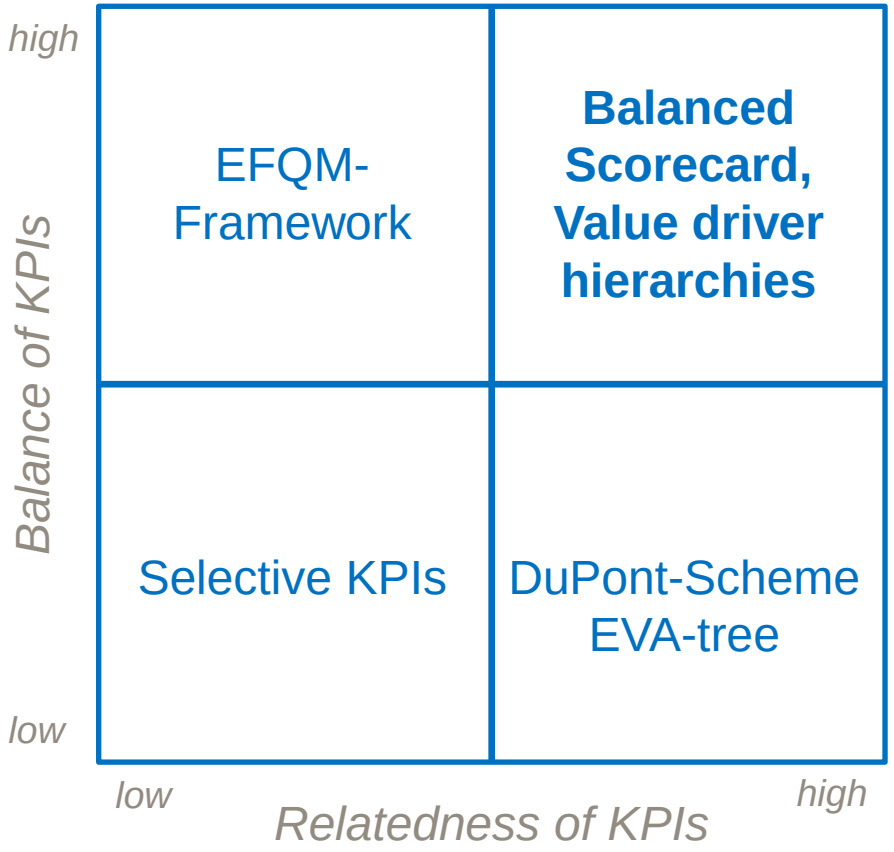
Source: Malmi/Brown 2008, Küpper et al (2013)

Purposes of PMS: Decision facilitating vs. decision influencing roles



Source: Küpper et al (2013)
Managerial Accounting

KPIs can be presented individually or grouped differing in balance and relatedness



Source: Weber/Sandt 2001

Information provided as KPIs can be used with different purposes

KPI use	
Instrumental	Direct use of the information provided for the solution of concrete problems of formation or enforcement
Conceptual	Promoting a general understanding of the business and the situation in which the manager(s) find themselves Influencing the thought processes and attitudes of managers
Symbolic	Use of the information after making a decision not based on this information as a tool for communicating and enforcing these decisions with third parties ("sham rationalization")
Diagnostic	Use of an information set in the sense of a confirmation of a predetermined target state (action only in case of deviations)
Interactive	Use of an information set in the sense of bundling management's attention to operational and strategic bottlenecks

Source: Simons (1995)
Managerial Accounting

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   i. BSC

STRATEGY 2025

We Deliver Excellence in a Digital World

Deutsche Post DHL Group has made significant progress with Strategy 2020. Due to its geographical spread and wide range of logistics offerings the Group is now better positioned than ever before. With **"Strategy 2025 – Delivering Excellence in a Digital World"** the company is laying the groundwork to continue its successful growth trajectory beyond 2020.

The four most important trends that have been impacting logistics in recent years will also shape the industry going forward: **Globalization**, **Digitalization**, **E-Commerce** and **Sustainability**. Strategy 2025 is the Group's response to these. The company will build on these trends to harness the potential for profitable long-term growth within in its core logistics businesses, at the same time stepping up the digital transformation that is already underway across the entire Group.

All efforts are focused on the established three bottom lines of Strategy 2020, which continue to provide the foundation for Strategy 2025. Accordingly, Deutsche Post DHL Group aims to be regarded as **Employer**, **Provider**, and **Investment of choice** in all its activities.

Source: DHL (2021)

Can the financial dimension capture vision and strategy?

III. Performance measurement systems

i. Overview of definitions, characteristics and purposes of PMI

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   i. BSC

The BSC as a tool to translate strategy into action

Source: Kaplan/Norton (1997), S. 29.

Principles central to the connection of the strategy to operational KPIs

Cause-and-effect chains

- A **strategy always** consists of **many cause-and-effect relationships** that can be formulated as if-then hypotheses.
- A **performance measurement** system should therefore **always disclose these hypotheses** about the relationships between key performance indicators and performance drivers (possibility of strategy control)

Result variables and performance drivers

- Each BSC uses certain common (generic) outcomes that reflect the related strategies of many companies
- Performance drivers, on the other hand, show **which special company-specific goals must be pursued**.
- Result variables without a performance driver do not show how the targeted results can and will be achieved

Alignment with financial targets

Features of a good Scorecard

1. **Tells the story of a firms strategy**, articulating a sequence of cause-and-effect relationships—the links among the various perspectives that align implementation of the strategy.
2. **Helps to communicate the strategy to all members** of the organization by translating the strategy into a coherent and linked set of understandable and measurable operational targets.
3. **Must motivate managers** to take actions that eventually result in improvements in financial performance.
   - Applies primarily to for-profit entities but has some application to not-for-profit entities as well
4. **Limits the number of measures**, identifying only the most critical ones.
5. **Highlights less-than-optimal trade-offs** that managers may make when they fail to consider operational and financial measures together.

Pitfalls in Implementing a Balanced Scorecard

- Managers should not assume the **cause-and-effect linkages** are precise: They are merely **hypotheses**.
- Managers should **not seek improvements across all of the measures all of the time**.
- Managers should **not use only objective measures**; subjective measures are important as well.
- Despite challenges of measurement, top management should **not ignore nonfinancial measures** when evaluating managers and other employees.

Balanced Scorecard: Concepts

CITIZEN PERSPECTIVE	Government Service Delivery	Govt. Transparency & Accountability	Equity	Employment	Health and Education
INTERNAL PROCESS PERSPECTIVE	Automation & Efficiency	Program Management	Scenario Planning	Decision Support	Policy Coherence
LEARNING & GROWTH PERSPECTIVE	Organizational Change Management	Learning & Promotion Opporunities	Adequate Compensation	Job Satisfaction	Empowerment
FINANCIAL PERSPECTIVE	Budget Credibility	Debt Management	Value of Money	Taxation	Public Investments

Example of selected KPIs by perspective

FINANCE

- Profitability
- Return on investment
- Investment security
- Portfolio optimizing
- Optimization of cost structure
- Manage business risks
- Optimized service level and contract management

CUSTOMERS

- Customer orientation
- Service culture
- Price level
- Product availability
- Service performance
- Cost optimization
- Product quality
- Reliability
- Delivery time

PROCESSES

- Target orientation
- Busines conform
- Integration of value chains
- Productivity
- Flexibility & stability
- Compliance
- Transparency
- Process maturity
- Process security

POTENTIAL

- Innovation behaviour
- Business understanding
- Target orientation
- Flexibility of employees
- Learning ability
- Quality orientation
- Self management
- Communication
- Talent management

Not like this!

"Did you say Balanced Scorecard?"

Balancing the contrasting aspects of operational and strategic management

• Quantifiable monetary KPIs	⟷	• Subjective, judgment-dependent performance drivers
• Measures of the results of past activities	⟷	• Key figures that drive future performance
• Internal metrics for critical business processes, learning, and growth	⟷	• Externally oriented metrics for shareholders and customers
• Aggregated financial metrics for tactical feedback on short-term operations at the lower- and mid-level mgmt.	⟷	• Aggregated financial key figures for strategic management at the highest corporate level
• Non-financial key figures at the operational level	⟷	• Non-financial metrics at the strategic level

Source: Reichmann (2011) p.552, Kaplan/Norton (1997) p.8-10

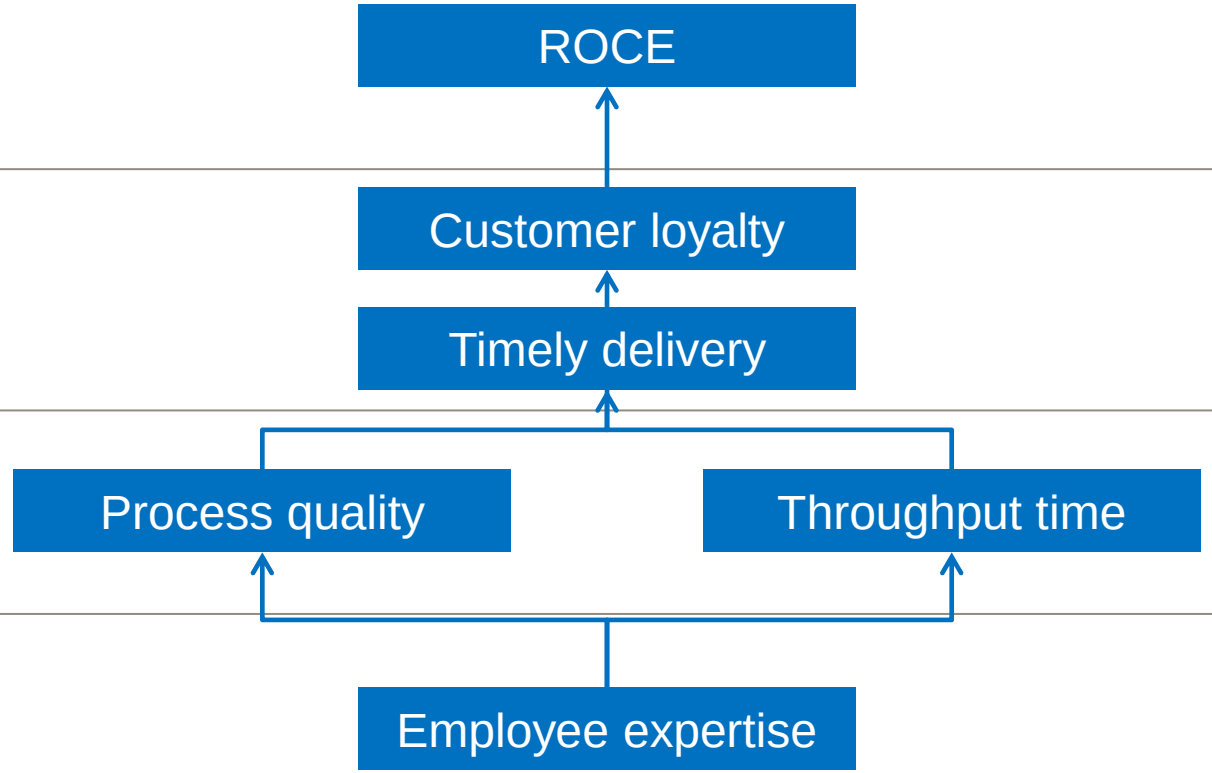
Cause- and effect-relationships as connecting element to vision/strategy

Financial perspective

Customer perspective

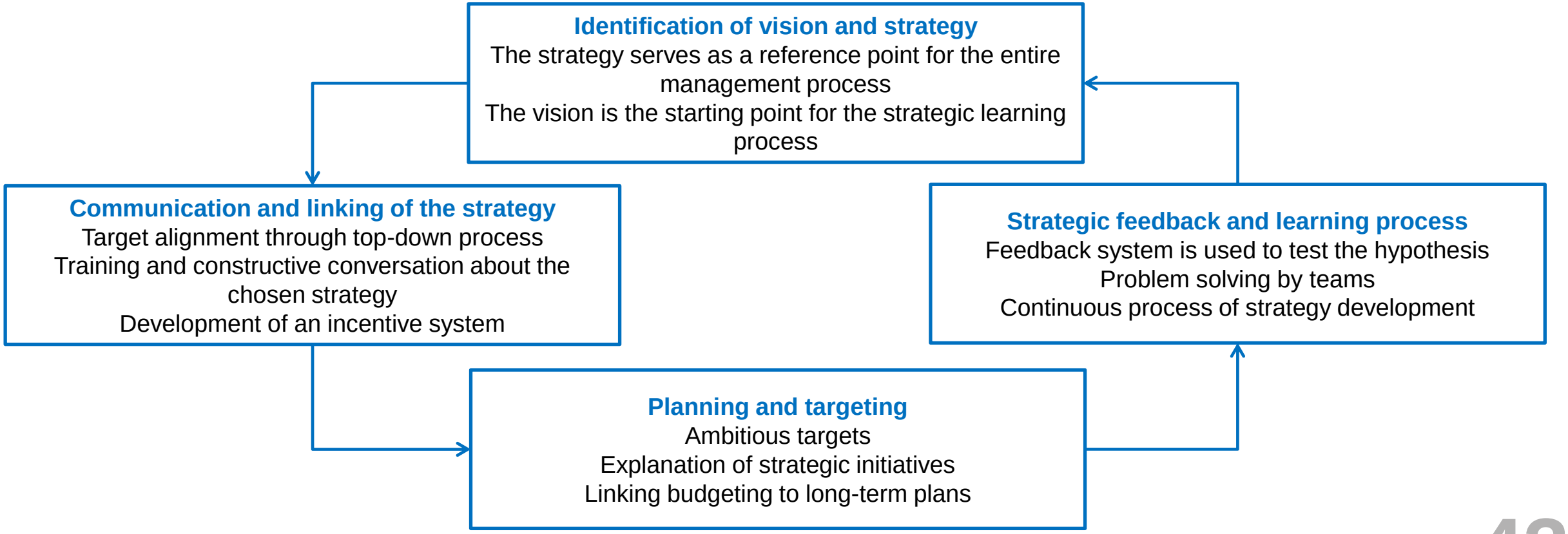
Internal processes

Learning and growth



Source: Kaplan/Norton (1997), S. 29.

The BSC is implemented as a continuous process



Source: Kaplan/Norton (1997), S. 29.

Frequently cited measures

Financial Perspective
Income measures: Operating income, gross margin percentage
Revenue and cost measures: Revenue growth, revenues from new products, cost reductions in key areas
Income and investment measures: Economic value added[a] (EVA®), return on investment

Customer Perspective
Market share, customer satisfaction, customer-retention percentage, time taken to fulfill customers' requests, number of customer complaints

Internal-Business-Process Perspective
Innovation Process: Percentage of processes with advanced controls, number of new products or services, new-product development times, and number of new patents
Operations Process: Yield, defect rates, percentage of on-time deliveries, average time taken to respond to orders, setup time, manufacturing downtime
Post-sales Service Process: Time taken to replace or repair defective products, hours of customer training for using the product

Learning-and-Growth Perspective
Employee measures: Employee education and skill levels, employee-satisfaction ratings, employee turnover rates, percentage of employee suggestions implemented, percentage of compensation based on individual and team incentives
Technology measures: Information system availability, percentage of processes with real-time feedback

Exercise Time – E1

Example of a strategy map [1/2]

STRATEGIC OBJECTIVES AND STRATEGY MAP	MEASURES	TARGETS	INITIATIVES
Financial Increase Revenue Increase Profitability Decrease Operating Costs	• Net Profit • Operating Costs • Revenue in Target Markets	• ↑5% per year • ↓3% Per year • ↑12% per year	• Implement new financial accounting system • Simplify billing operations
Customer Improve Clarity of Offering Improve Market Perception Improve End-User Experience	• % Market Share index • % Customer Satisfaction Index	• ↑3% per Year • ↑5% increase in index next period the stabilize	• Competitive end user requirements market studies for new UK regions • "Improve the offering" two year program
Internal Improve Offering Selection Improve Integrated Service Improve Ease of Use for End Users	• New products as % of sales • Brand Awareness score • End user experience score	• 12% this year • ↑5% per year • >90% every reporting period	• Create improved offering selection process • Hook into "Improve the Offering" program • Training program for new offerings and user interface
Organizational Capacity Improve Knowledge and Skills Improve Telecoms Network Improve Technology	• Employee development plans • Technology training index • Network Efficiency Index	• 95% in place • 90% efficient • 99.99% Uptime	• Product and marketing training program • 2 year renew the network staged plan and roll-out • Technology improvement program

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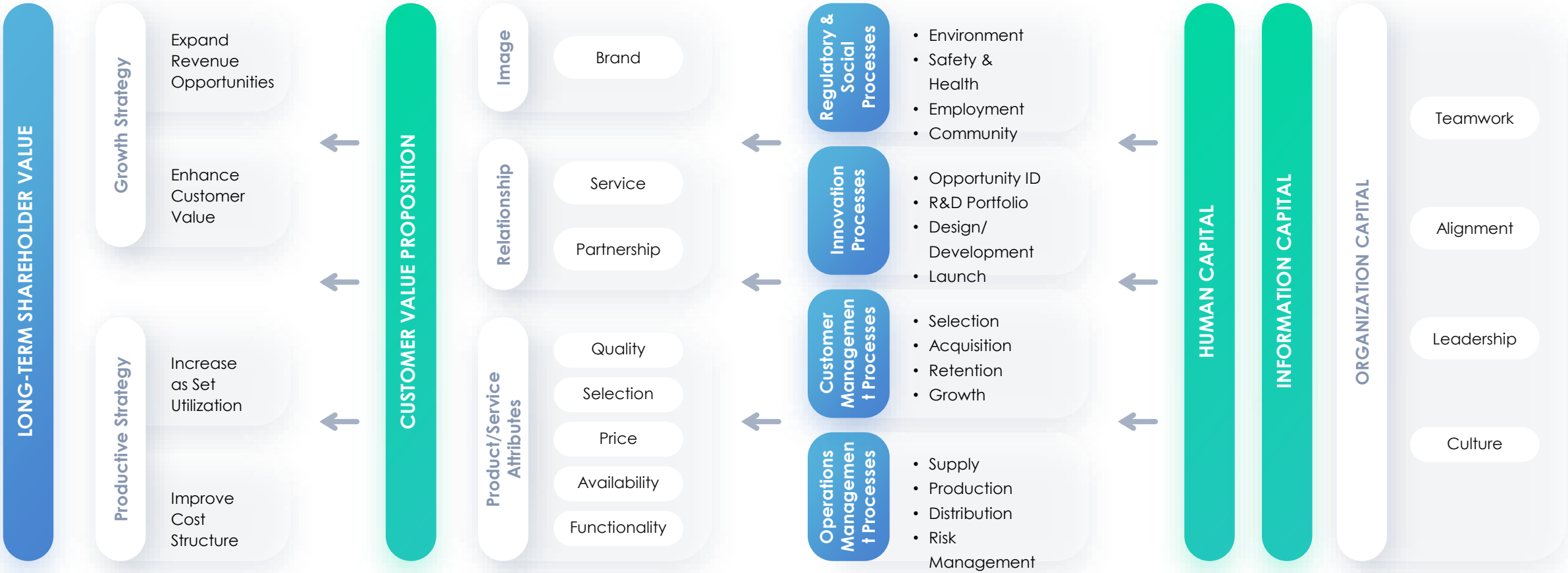
Example of a strategy map [2/2]



FINANCIAL PERSPECTIVE
(IT Value)

CUSTOMER PERSPECTIVE
(User)

INTERNAL PERSPECTIVE
(Operational Excellence)

GROWTH PERSPECTIVE
(Future Orientation)

Elements of a Structural Analysis of Strategy Maps

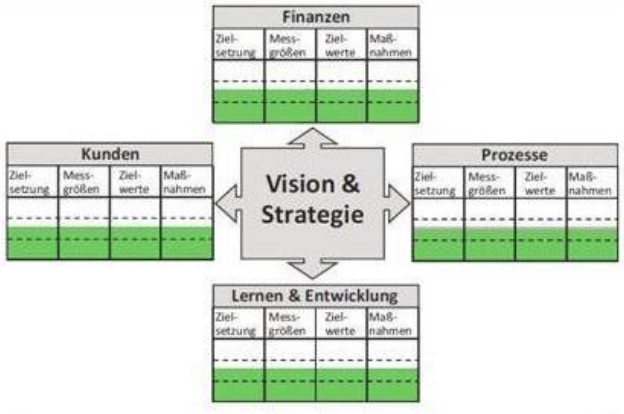
1. **Strength of ties**—Ties are the causal links between strategic objectives and can be qualified as strong, moderate, or weak.
2. **Orphan objectives**—An orphan objective has only weak ties leading out of it to other strategic objectives.
3. **Focal points**—A focal point is a strategic objective that has many other links funneling INTO it.
4. **Trigger points**—A trigger point is a strategic objective where many ties spur OUT from it, resulting in the achievement of many strategic objectives.
5. **Distinctive objectives**—These are strategic objectives that distinguish an organization from its competitors, based on the organization's strategy.

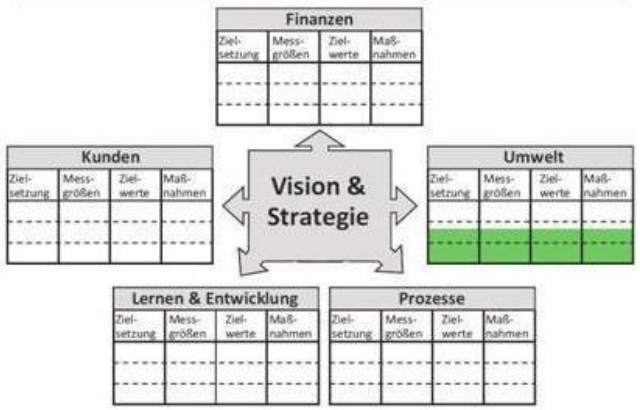
Three ways to integrate sustainability into the BSC framework:

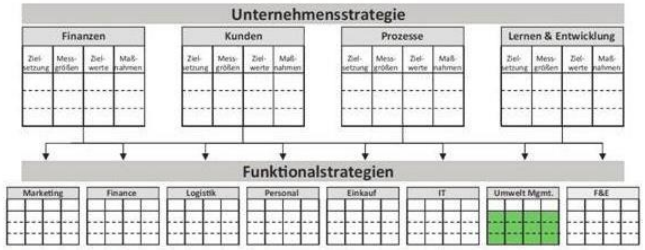
1 Integration into BSC perspectives

2 Extension by sustainability perspective

3 Separate sustainability scorecard







Source: Cosman 2016, Schrader/Vollmar 2013, Schaltenegger 2004

Limits of BSC implementation

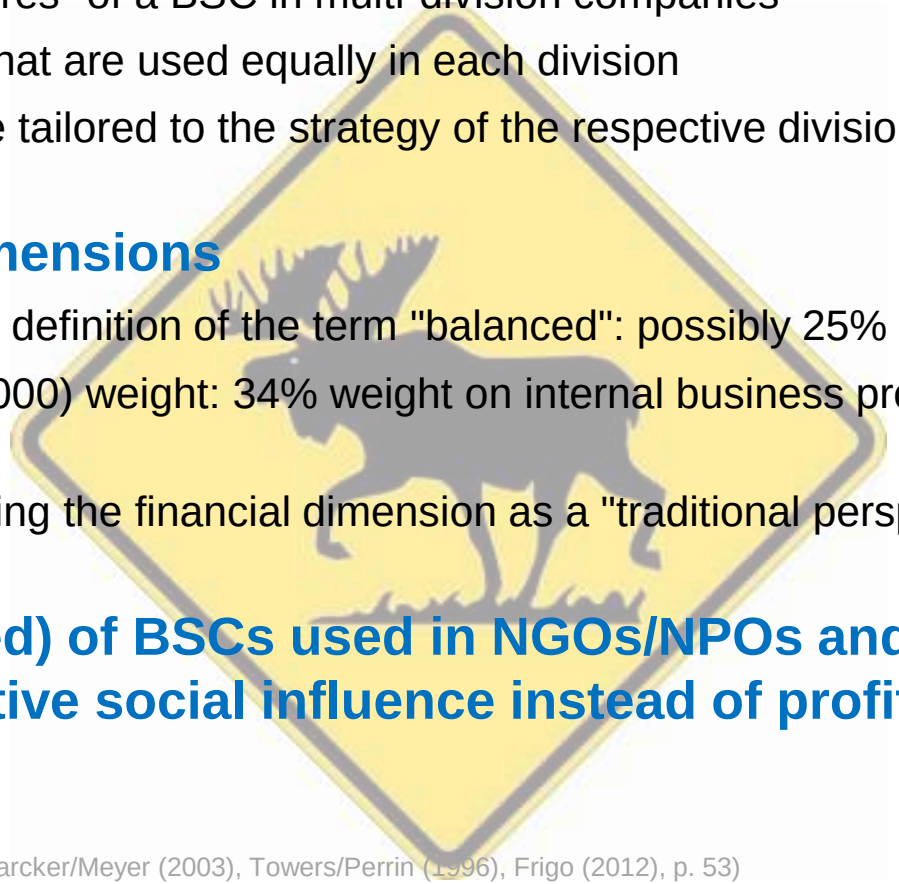
Common measure bias (Lipe/Salterio (2000))

- Overvaluation of "common measures" of a BSC in multi-division companies
- Common measures = measures that are used equally in each division
- Ignore "unique measures" that are tailored to the strategy of the respective division and thus potentially more meaningful for strategy tracking

Weighting of perspectives/dimensions

- Kaplan and Norton (1992) give no definition of the term "balanced": possibly 25% weighting of each dimension (?)
- In contrast, Kaplan and Norton (2000) weight: 34% weight on internal business processes and 22% each on the other dimensions
- Practical observation: Overweighting the financial dimension as a "traditional perspective" (Ittner/Larcker/Meyer (2003); Towers Perrin (1996))

Increasing use (partly modified) of BSCs used in NGOs/NPOs and in the public sector (e.g. FBI, U.S. Army) Mission: positive social influence instead of profit maximization (Frigo (2012), p. 53)



Source: Lipe/Salterio (2000), Kaplan/orton (1992, 2000), Ittner/Larcker/Meyer (2003), Towers/Perrin (1996), Frigo (2012), p. 53)

Example of an NGO scorecard with individualized dimensions

Financial
What financial framework conditions do we have to comply with in order to fulfil our mission?

Beneficiaries
How should we act towards service recipients in order to realize our mission?

Vision / Strategy

Priority
What objective do we need to achieve?

Learning and Growth
What requirements do we have to meet in order to ensure continuous improvements in terms of order fulfilment?

Internal processes
Which processes require excellent performance from us in order to fulfill our mission?

Source: Bono (2006)
Managerial Accounting

IV. Evaluating Strategic Success

Evaluating the Success of Strategy and Implementation

- To evaluate the success of a company's strategy and implementation, management must compare the target and actual performance columns in the balanced scorecard.
- If a company does not meet its targets on the two perspectives that are more internally focused (learning and growth and internal business processes), it would conclude that it did not implement its strategy because it did not implement the activities that would give it competitive advantage.
- If a company performs well in the internally focused perspectives but not customer and financial measures, it may conclude that the strategy was faulty because there was no effect on customers or on long-run financial performance and value creation.

Strategic Analysis of Operating Income (1 of 2)

- To evaluate the success of a strategy, managers and management accountants need to link strategy to the sources of operating-income increases.
- To do this evaluation, management accountants start by analyzing three main factors:

Strategic Analysis of Operating Income (2 of 2)

1. The **growth component** measures the change in operating income attributable solely to the change in quantity of output sold between years.
2. The **price-recovery component** measures the change in operating income attributable solely to changes in prices of inputs and outputs between years. This component measures the change in revenues as a result of a change in output price compared with the change in costs as a result of change in input prices.
3. The **productivity component** measures the change in costs attributable to a change in the quantity of inputs used in current year relative to the quantity of inputs that would have been used in the prior year to produce the current year output. This component measures the amount by which operating income increases by using inputs efficiently to lower costs.

Formulas Used for Strategic Analysis of Income Summary

Growth Component

- Revenue effect of growth
- Cost effect of growth
- Cost effect of growth for Fixed costs

Price-Recovery Component

- Revenue effect of price recovery
- Cost effect of price recovery
- Cost effect of price recovery for fixed costs

Productivity Component

- Cost effect of productivity for variable costs
- Cost effect of productivity for fixed costs

REVENUE EFFECT OF GROWTH

$$\text{Revenue Effect of Growth} = \left[\text{Actual Units of Output Sold in the Current Period} - \text{Actual Units of Output Sold in the Prior Period}\right] \times \text{Prior Period Selling Price}$$

COST EFFECT OF GROWTH OF VARIABLE COSTS

$$\text{Cost effect of growth for variable costs} = \left[\text{Units of input Required to Produce Current Output in the Prior Period} - \text{Actual units of Input used to Produce Prior Period Output}\right] \times \text{Prior Period Input Price}$$

COST EFFECT OF GROWTH FOR FIXED COSTS

$$\text{Cost effect of growth for fixed costs} = \left[\text{Actual Units of capacity in Prior Period to Produce Current Period Output} - \text{Actual units of Capacity in the Prior Period}\right] \times \text{Prior Period Price per unit of capacity}$$

REVENUE EFFECT OF PRICE RECOVERY

$$\text{Revenue Effect Of Price-Recovery} = \left[\text{Current Period Selling Price} - \text{Prior Period Selling Price}\right] \times \text{Current Period Units Sold}$$

COST EFFECT OF PRICE RECOVERY

$$\text{Cost Effect Of Price-Recovery for Variable Costs} = \left[\text{Current Period Input Price} - \text{Prior Period Input Price}\right] \times \text{Units of Input required to produce Current Period's Output in the Prior Period}$$

COST EFFECT OF PRICE RECOVERY FOR FIXED COSTS

$$\text{Cost Effect Of Price-Recovery for Fixed Costs} = \left[\text{Current Period Price per Unit of Capacity} - \text{Prior Period Price per Unit of Capacity}\right] \times \text{Actual Units of Capacity on Prior Period to Produce Current Period's Output}$$

COST EFFECT OF PRODUCTIVITY FOR VARIABLE COSTS

$$\text{Cost Effect Of Productivity for Variable Costs} = \left[\text{Actual Units of Input used to Produce Current Period Output} - \text{Units of Input Required to Produce Current Period's Output in Prior Period}\right] \times \text{Input Price in Current Period}$$

COST EFFECT OF PRODUCTIVITY FOR FIXED COSTS

$$\text{Cost Effect Of Productivity for Fixed Costs} = \left[\text{Actual Units of Capacity in Current Period} - \text{Actual Units of Capacity in Prior Period to Produce Current Period's Output}\right] \times \text{Price Per Unit of Capacity in Current Period}$$

Exercise Time – E2

References

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