



# Global Knowledge Management

## Assessment

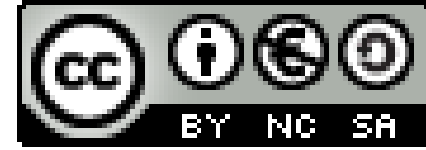
**Jan M. Pawlowski**  
Autumn 2013



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## Collaborative Course Development!

Thanks to my colleagues Prof. Dr. Markus Bick and Prof. Dr. Franz Lehner who have developed parts of the Knowledge Management Course which we taught together during the Jyväskylä Summer School Course 2011.

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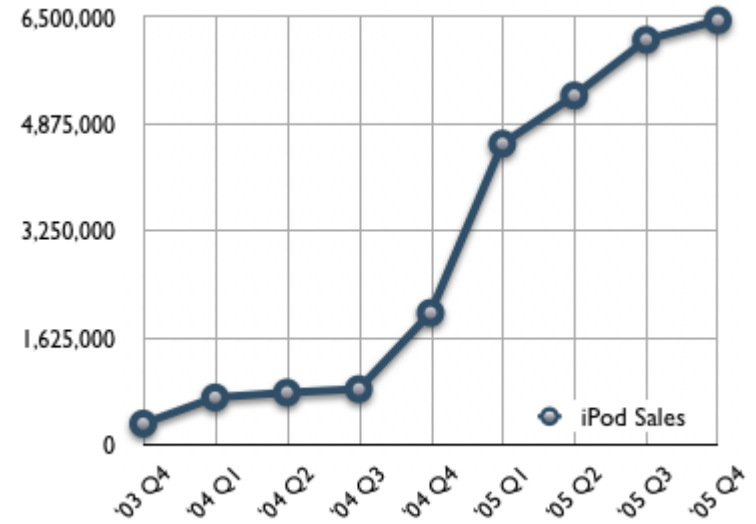
Web: <http://www.wi.uni-passau.de/>



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# What is success?



... reaching a self defined goal!



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# The Challenge

- How to measure KM success
  - Business Perspective (Quality, Performance, Customers, ...)
  - Knowledge Perspective (Organizational, Individual)
- Which are entities to measure
  - Intellectual capital
  - KM resources
  - Career development
  - User / customer satisfaction
  - Project success
  - And many more...



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# Success in Knowledge Management (North, 2008)

## Success at Business Level



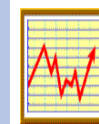
Cost  
reduction



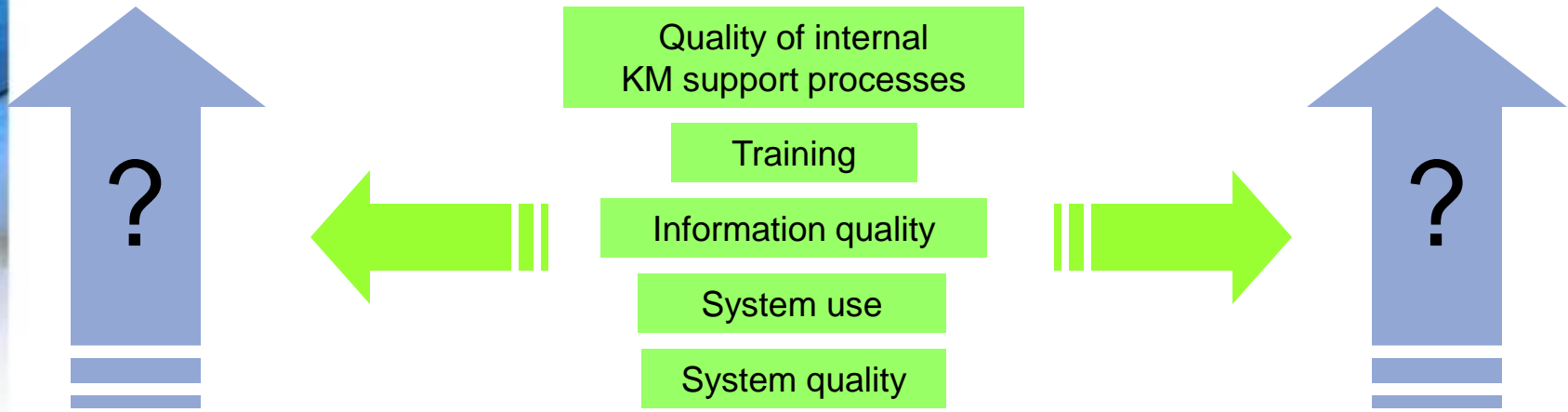
Quality  
improvements



Time  
saving



increasing  
revenues



## Success at KM Level

Knowledge-  
transfer

Documentation of  
„best-practices“

Reuse of Knowledge

Internal  
Transparency

Internal communication

User Satisfaction

Enterprise culture

Optimizing knowledge  
intensive processes

Develoing competences /  
Knowledge capital

establishing  
Communities

# Some studies as a starting point

## Starting points

- Barriers
- Success factors
- Assessment of those: Are success factors measurable? Were they measured in the corresponding research work



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# Studies on KM Success Factors

## Definition of Success:

“KM success is a multidimensional concept. It is defined by

- capturing the right knowledge,
- getting the right knowledge to
- the right user,
- and using this knowledge to improve organizational and/or individual performance.

KM success is measured using the dimensions of impact on business processes, strategy, leadership, efficiency and effectiveness of KM processes, efficiency and effectiveness of the KM system, organizational culture, and knowledge content.” (Jennex et al. 2007)

## Critics:

no validated understanding of KM success  
inferences on business performance are not measurable



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# Studies on KM Success Factors

<i>Dimension</i>	<i>Core barrier/success factor</i>
A. Individual	1. Top management support
	2. Communications
	3. Personal development
	4. Personality
B. Organisation	5. Target system
	7. Architecture of the KM processes
	8. KM processes
	9. Delegation and participation
	9. Employee motivation
	10. Social networks and relationships
C. Technology	11. Information and communications technology
	12. Systems quality
	13. Content of KM systems
D. Culture	14. Enterprise culture conducive to fostering knowledge
E. Environment of the enterprise	15. External conditions
F. Institutionalised KM	16. Knowledge base and knowledge collection
	17. Application of knowledge





# Merged list of indicators

## A Assessment of KM as an enterprise internal service and interdisciplinary support function

1. Institutionalised KM
2. History of support for KM
3. Sufficient funding for KM activities
4. Communication of KM strategies and targets
5. Linkage/relationships of KM targets to the strategic targets of the enterprise
6. Clarity of accountability for KM at all levels of the organisation
7. Standardised, systemic knowledge processes are defined
8. Employees are engaged in knowledge processes and participate in decisions
9. Suitable and user-friendly KM information technology is present
10. Employees are motivated towards knowledge transfer
11. Knowledge quality is assured through good quality management processes
12. KM activities are regularly benchmarked internally and externally

## B Assessment of the individual working context with regard to the availability of required knowledge and information

13. Free time to engage in KM activities
14. Access to new knowledge, exchange of knowledge in the network is sufficiently possible
15. Sufficient qualifications for interaction with technology of KM activities
16. Sufficient qualifications for interaction with knowledge sharing activities
17. Awareness/understanding of the utility of KM
18. Adequate empowerment for employees to undertake KM activities
19. Integration of knowledge activities into essential work processes
20. Shared vision with the enterprise
21. Motivation for knowledge sharing, e.g. through quickly visible success, suggestion schemes
22. Direct communication and knowledge exchange for collaborative problem solving
23. Lack of acknowledgement of knowledge emanating from lower organisational ranks
24. Tolerance for learning from mistakes
25. Culture of mutual trust and knowledge sharing

# How to assess success?

- Main goals
  - Measuring the success of KM
  - Understanding the relation of KM and Business Success
  - Understanding and assessing the organization's KM situation
- Methods
  - Intellectual capital statement
  - Benchmarking
  - Metrics and Indicators
  - Balanced Score Card approaches
  - Quality Assessment
  - Self assessment
  - ...

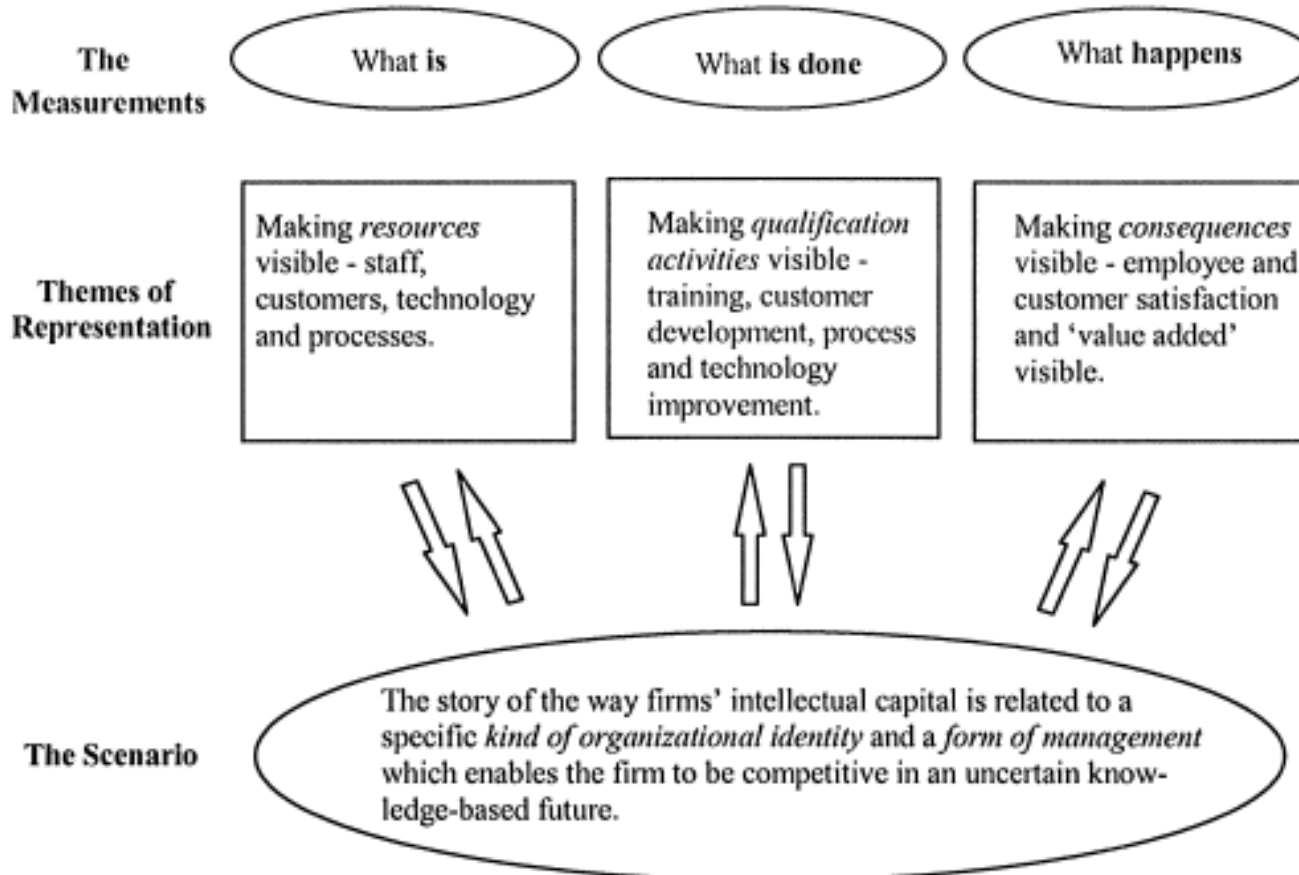


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# Intellectual Capital (Bukh, Larsen & Mouritsen, 2001)

- Knowledge and knowing capability of an organisation, intellectual community, or professional practice

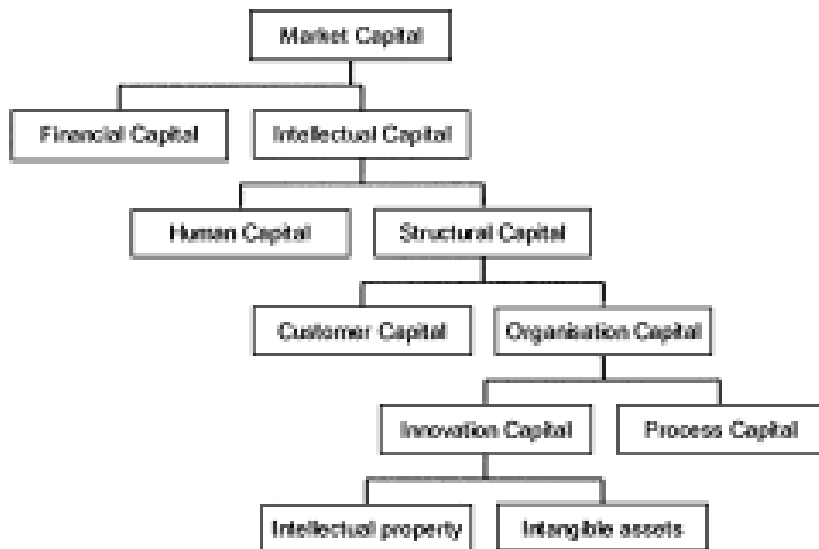


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# Intellectual Capital (Bukh, Larsen & Mouritsen, 2001)

- Different aspects, mainly intangible assets
- Human vs structural capital
- Again: how to measure it...
  - Some metrics following...



Visible Equity (book value) Tangible assets minus visible debt	Intangible Assets (stock price premium)		
	External structure (brands, customer and supplier relations)	Internal structure (the organization: man- agement, legal struc- ture, manual systems, attitudes, R&D, soft- ware)	Individual competence (education, experience)

# Intellectual Capital Metrics: ICM Group Study (Bose, 2004)

## **Value extraction:**

- 1) Profits resulting from new business operations
- 2) Return on net asset value
- 3) Total assets
- 4) Revenues resulting from new business operations
- 5) Market value
- 6) Patents pending
- 7) Return on net asset resulting from new business operations

## **Customer capital:**

- 1) Market share
- 2) Customer rating
- 3) Satisfied customer index
- 4) Number of new customers/new market/leads, etc.
- 5) Annual sales/customer
- 6) Average customer size
- 7) Average time from customer contact to sales response
- 8) Ratio of sales contacts to sales closed

## **Structural Capital:**

- 1) Administrative expense/total revenues
- 2) Processing time, out-payments
- 3) Computers/employee
- 4) Contracts filed without error
- 5) Corporate quality performance
- 6) Investment in IT

## **Value creation:**

- 1) Training expense/employee
- 2) Average customer duration with the company (months)
- 3) R&D invested in basic research
- 4) R&D invested in product design
- 5) Investment in new product support and training
- 6) Satisfied employee index
- 7) Relationship investment/customer
- 8) Training expense/administrative expense
- 9) R&D invested in applications

## **Human capital:**

- 1) Average years of service with the company
- 2) Number of employees
- 3) Number of managers
- 4) Revenues/employee
- 5) Employee turnover
- 6) Number of female managers
- 7) Profits/employee
- 8) Average age of employees
- 9) Number of exempt full-time employees
- 10) Average age of full-time exempt employees
- 11) Percent of company managers with advanced degrees



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# Intellectual Capital Metrics: Roos' Study (Bose, 2004)

## ***Human capital (competence, attitude, intellectual agility):***

- 1) *Percent of employees with advanced degrees*
- 2) *IT literacy*
- 3) *Hours of training/employee*
- 4) *Average duration of employment*
- 5) *Hours spent in debriefing*
- 6) *Hours spent by senior staff explaining strategy and actions (overlap expertise)*
- 7) *Leadership index*
- 8) *Motivation index*
- 9) *Savings from implemented employee suggestions*
- 10) *New solutions/products/processes suggested*
- 11) *Background variety index (individual and group level)*
- 12) *Company diversification index*

## ***Structural capital (relationships, organization, renewal and development):***

- 1) *Percentage of supplier/customer business accounted for*
- 2) *Length of relationship*
- 3) *Partner satisfaction index*
- 4) *Customer retention*
- 5) *Administrative expenses/total revenues*
- 6) *Revenues from patents/software/data/databases/etc.*
- 7) *Processes completed without error*
- 8) *Cycle/process times*
- 9) *Percentage of business from new products*
- 10) *Training efforts – expense/employee, hours/employee*
- 11) *Renewal expenses/operating expenses*
- 12) *New patents/software/etc. filed*



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# Metrics: Universal Intellectual Capital Report (Bose, 2004)

## **Financial focus:**

- 1) Total assets
- 2) Total assets/employee
- 3) Revenues/total assets
- 4) Profits/total assets
- 5) Revenues resulting from new business operations
- 6) Revenues/employee
- 7) Customer time/employee attendance
- 8) Profits/employee
- 9) Lost business revenues compared to market average
- 10) Market value
- 11) Return on net asset resulting from new business operations
- 12) Value added/IT employees
- 13) Investments in IT
- 14) Value added/customer

## **Customer focus:**

- 1) Market share
- 2) Number of customers
- 3) Annual sales/customer
- 4) Customers lost
- 5) Average duration of customer relationship
- 6) Average customer size
- 7) Customer rating
- 8) Customer visits to the company and the number of hits on the company's Web site
- 9) Days spent visiting customers
- 10) Customers/employees
- 11) Revenue generating staff
- 12) Average time from customer contact to sales response
- 13) Ratio of sales contacts to sales closed
- 14) Satisfied customer index
- 15) IT investment/salesperson (and perhaps dollars used in advertisements and their effectiveness)
- 16) IT investment/service and support employee
- 17) IT literacy of customers
- 18) Support expense/customer
- 19) Service expense/customer/year
- 20) Service expense/customer/contact

## **Process focus:**

- 1) Administrative expense/total revenues
- 2) Cost for administrative error/management revenues
- 3) Processing time, out-payments
- 4) Contracts filed without error
- 5) Function points/employee-month
- 6) PCs and laptops/employee
- 7) Network capability/employee
- 8) Administrative expense/employee
- 9) IT expense/employee
- 10) IT expense/administrative expense
- 11) Administrative expense/gross premium
- 12) IT capacity (CPU and DASD)
- 13) Change in IT inventory
- 14) Corporate quality performance (e.g., ISO 9000)
- 15) Corporate performance/quality goal
- 16) Discontinued IT inventory/IT inventory
- 17) Orphan IT inventory/IT inventory
- 18) IT capacity/employee
- 19) IT performance/employee



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# Metrics: Universal Intellectual Capital Report (Bose, 2004)

## **Renewal and development focus:**

- 1) Competence development expense/employee
- 2) Satisfied employee index
- 3) Relationship investment/customer
- 4) Share of training hours
- 5) Share of development hours
- 6) Opportunity share
- 7) R&D expense/administrative expense
- 8) Training expense/employee
- 9) Training expense/administrative expense
- 10) Business development expense/administrative expense
- 11) Share of employees under age 40
- 12) IT development expense/IT expense
- 13) IT expenses on training/IT expense
- 14) R&D resources/total resources
- 15) Customer opportunity base captured
- 16) Average customer age; education; income
- 17) Average customer duration with company in months
- 18) Educational investment/customer
- 19) Direct communications to customer/year
- 20) Non-product-related expense/customer/year
- 21) New markets development investments
- 22) Structural capital development investment
- 23) Value of EDI system
- 24) Upgrades to EDI system
- 25) Capacity of EDI system
- 26) Ratio of new products (less than two years) to full company product family
- 27) R&D invested in basic research
- 28) R&D invested in product design (e.g., dollars invested in changes of quality, quantity, and variety of products/designs/etc.)
- 29) R&D invested in applications
- 30) Investments in new product support and training
- 31) Average age of company patents
- 32) Patents pending/software, data, databases developed

## **Human focus:**

- 1) Leadership index
- 2) Motivation index
- 3) Empowerment index
- 4) Number of employees/employee shares of the company (percentage of shares owned by employees, program for employees to buy company shares, etc.)
- 5) Employee turnover
- 6) Average years of service with company
- 7) Number of managers
- 8) Average age of employees and number with pertinent experience in trade and IT
- 9) Time in training (days/year)
- 10) IT literacy of staff
- 11) Number of directors
- 12) Number of female directors
- 13) Number of full-time or permanent employees
- 14) Average age of full-time or permanent employees
- 15) Average years with company of full-time or permanent employees
- 16) Annual turnover of full-time permanent employees
- 17) Per capita annual cost of training, communication, and support programs for full-time permanent employees
- 18) Full-time or permanent employees who spend less than 50 percent of work hours at a corporate facility
- 19) Percentage of full-time permanent employees
- 20) Per capita annual cost of training, communication, and support programs
- 21) Number of full-time temporary employees
- 22) Average years with company of full-time temporary employees
- 23) Per capita annual costs of training and support programs for full-time temporary employees
- 24) Number of part-time employees or non-full-time contractors, average duration of contract
- 25) Company managers with advanced degrees; business, science and engineering, liberal arts



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# Intellectual Capital: Summary

- A variety of knowledge related aspects discussed
- Not all aspects are related to KM
- Selection and decision process
  - How to choose appropriate metrics?
  - How to embed metrics in a decision process (e.g. balanced score card)?
  - How to relate a KM activity with metrics?
- Many approaches cannot be applied for KM project success
- No understanding / relation of business and KM success
- Lack of global / inter-organizational components
- However: Useful tool for developing individual assessment schemes (project- / context-dependent)



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# Measuring KM Success – The KnowMetrix Approach (Lehner, 2009)

## Success Factors in KM-Projects

- Knowledge-oriented culture
- Support by top management
- Economic benefit or cost influence
- Clear vision and terminology
- Motivational measures
- Technical and organizational infrastructure
- Low rate of change concerning the knowledge structure
- Multiple or redundant channels of information and knowledge exchange

## Approach

- Assessment of success factors
- Priorization: Importance & performance
- Usage to understand status (a priori) and KM success (ex-post)



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## Difficulties in measuring KM success or impacts

1. Availability of valid and reliable measurement instruments
2. Interpretation problems – what do numbers, figures really mean?
3. Time-lag between interventions and impacts
4. Causal chains not analysed so far
5. What is intended at all? (operationalising success)



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# KnowMetric Factors

- Top Management Support
- Communication
- HR Development
- Personality
- Target System
- Organizational Structure
- Delegation / participation
- Motivation
- Social networks
- ICT systems
- KMS Contents
- Organizational culture
- External factors
- Knowledge identification
- Knowledge usage



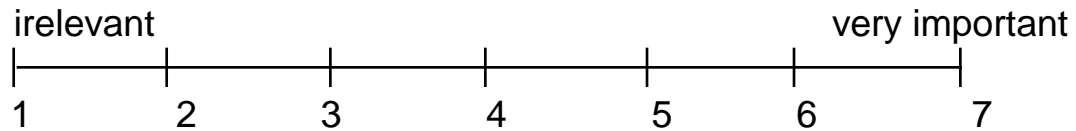
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# Measuring KM Success – The KnowMetrix Approach

For each indicator

Priority / Importance



Performance



For KM in total

Overall success



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# Measuring KM Success – The KnowMetrix Approach

## Procedure

- presentation of the method as well as time schedules
- adaption of the list of indicators to the specific situation
- preparing the questionnaire
- selecting employees
- data collection
- analysing results
- presentation results and measures



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## Analysing Results

- General / overall assessment of KM performance and employee satisfaction
- Assessment of performance indicators
- Importance of the single factors (coherent view between groups?)
- Comparison of performance and significance
- Comparison of differences between performance and significance
- Calculated success based upon formulas



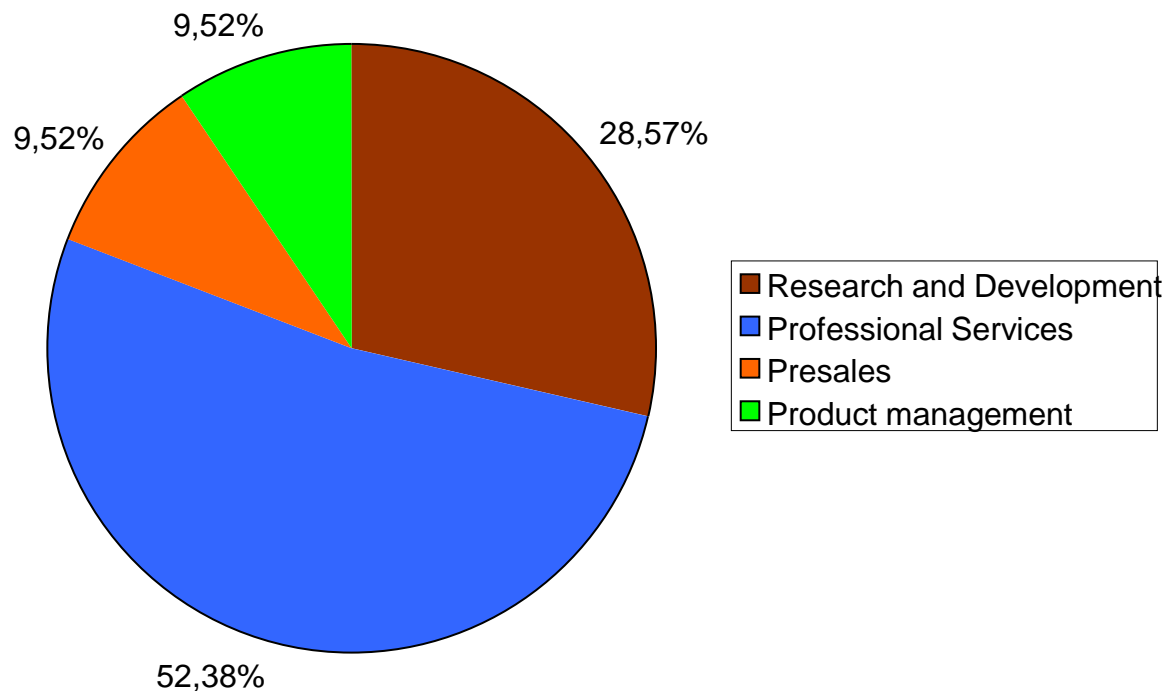
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# Measuring KM Success – The KnowMetrix Approach

## Example: application of KnowMetrix in a software company

The company was founded in 1997 and develops software-solutions for the management of product information (PIM) as well as the output channels online, print and stationary point of sale (POS). The software company employs altogether about 90 staff members, about 60 of these in Munich. Apart from the head quarters, the company has further branches in the United Kingdom, the Netherlands, Switzerland, Austria, Sweden, Poland and the USA.

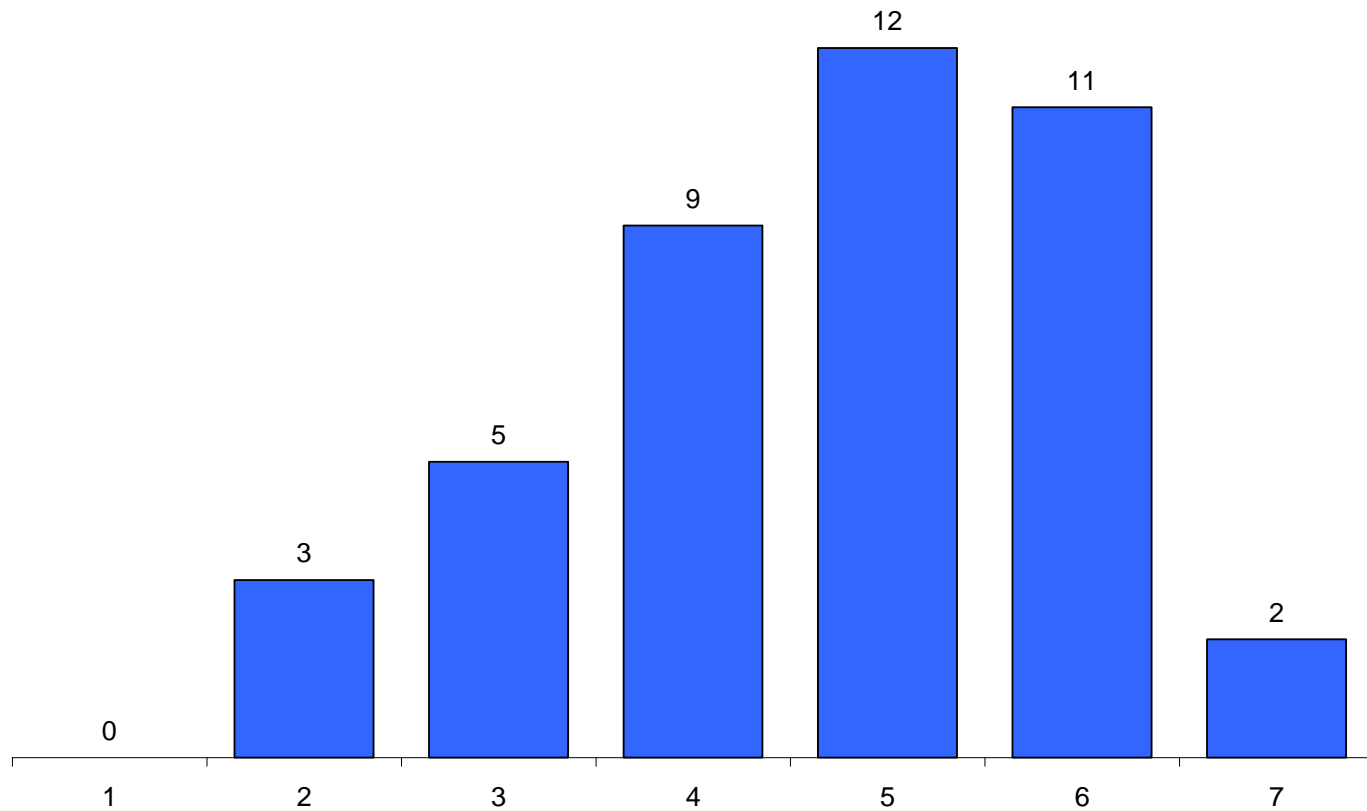


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# Measuring KM Success – The KnowMetrix Approach



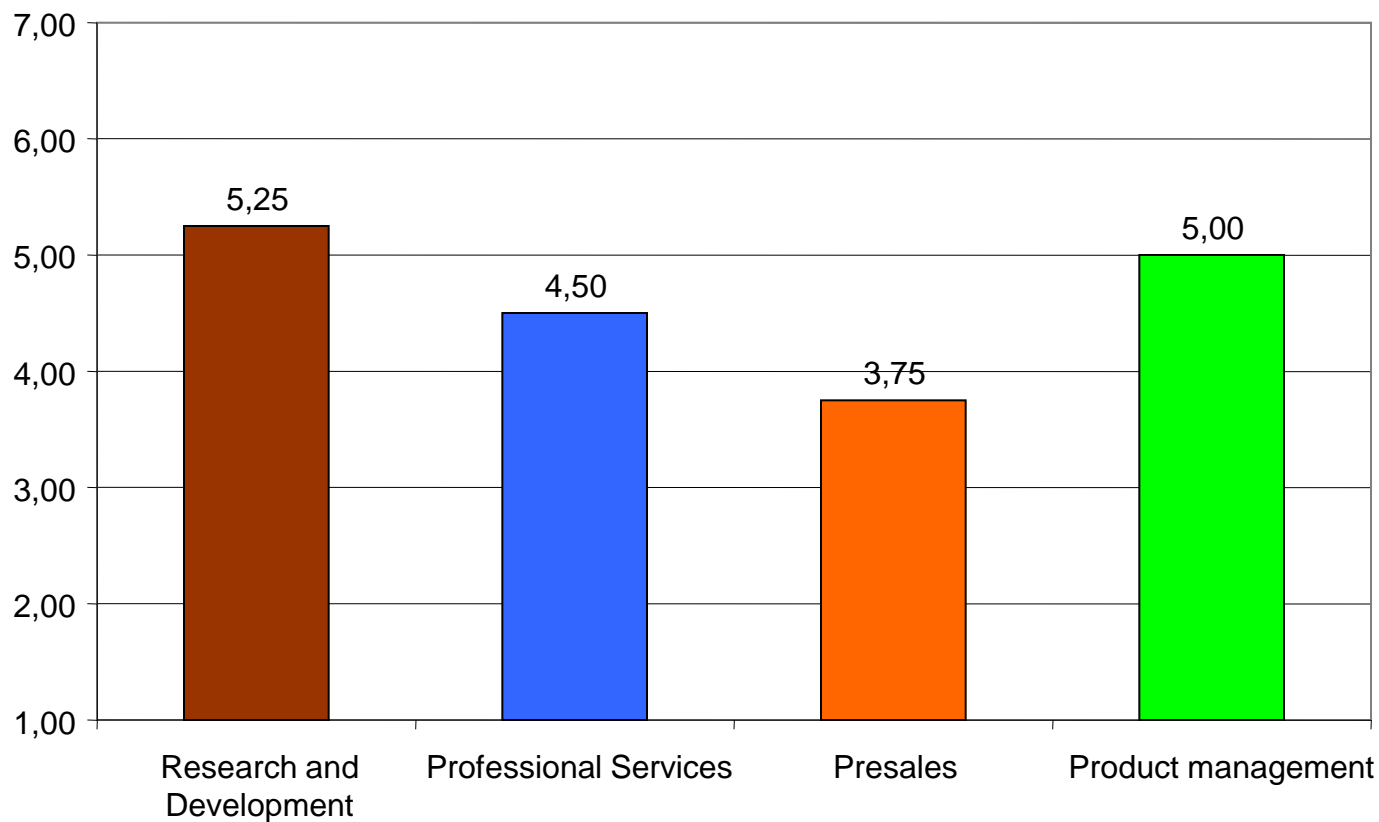
Overall satisfaction with KM services



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# Measuring KM Success – The KnowMetrix Approach



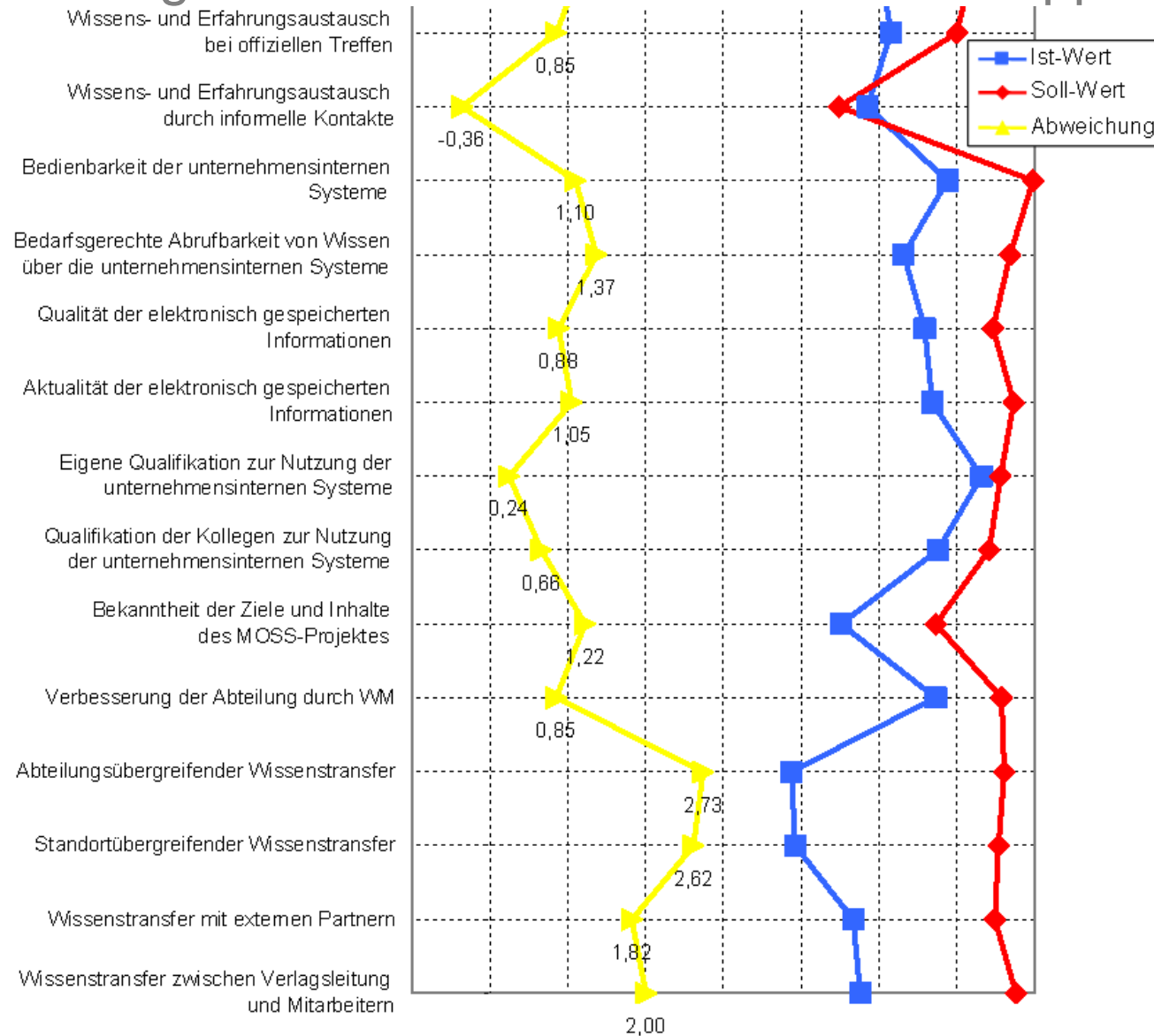
Overall satisfaction with KM services



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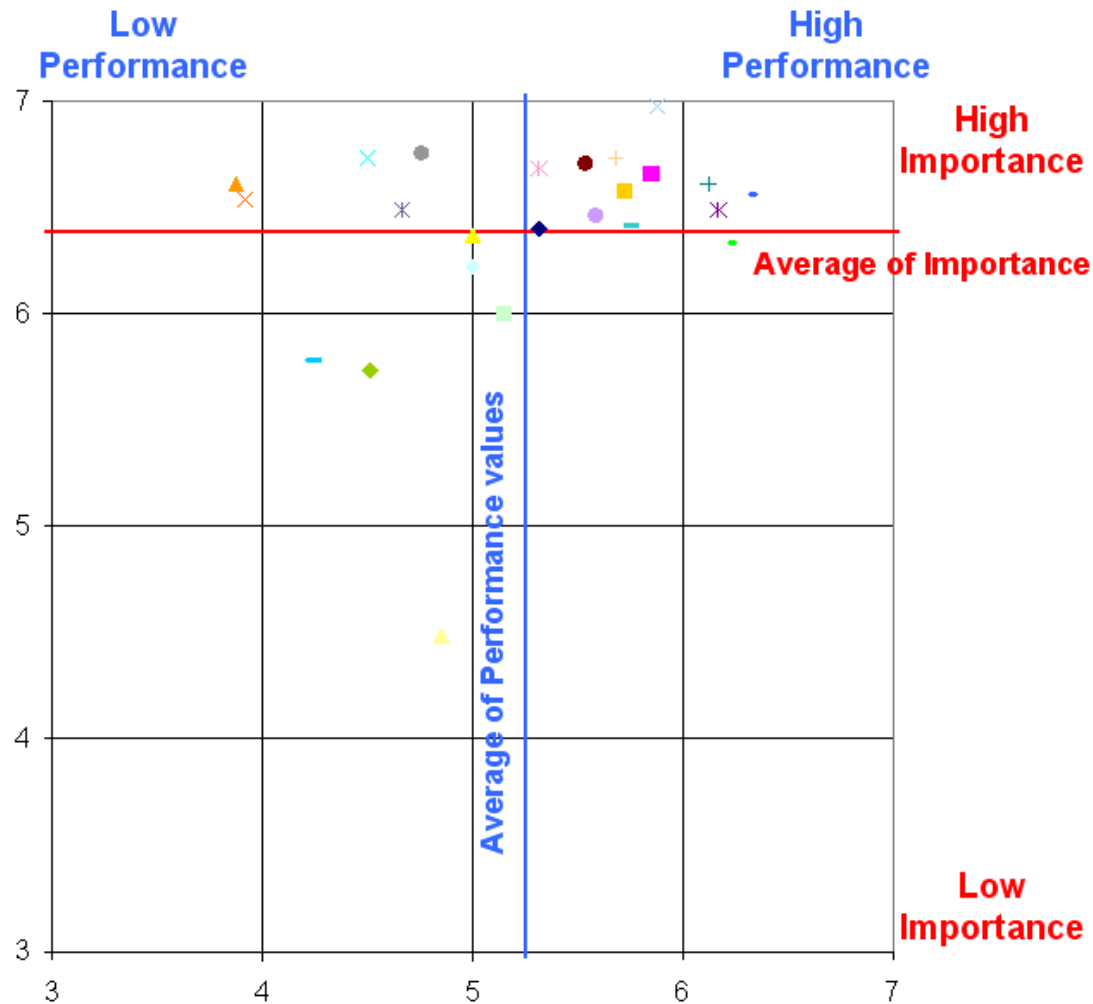
# Measuring KM Success – The KnowMetrix Approach



Comparing importance and performance values of the indicators  
 Contrasting importance and performance values in a matrix



# Measuring KM Success – The KnowMetrix Approach



Contrasting importance and performance values in a matrix

## Characteristics of the CSF method

- Holistic view of success
- Based on a pre-defined list of indicators
- flexible, easy to understand (visualisation of results and findings)
- Low effort
- Easy to repeat
- Focused on the specific situation of an organisation



# Summary

- Feasible approach for reliable and quick assessment
- Different usage scenarios (KM status, project success)
- Lack of global aspects
- Open questions
  - Which factor acts as a success factor and which as a barrier factor?
  - Which factors known until now, really influence knowledge management on a personnel level?
  - Testing validity and reliability of KnowMetrix
  - Development of a standardised catalogue of indicators and influence factors (resp. success factors)
  - Software tool for automated analysis



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# Addressing global aspects

- No pre-defined criteria catalogues
- Aspects
  - Project success (e.g. communication breakdowns, interrupted projects)
  - Social capital, interorganizational knowledge exchange
- Methods
  - Metric selection depending on barriers and success factors (e.g. extending Lehner's KnowMetrix)
  - Mixed approaches of external / internal assessment



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# Social capital across organizations (Inkpen & Tsang, 2005)

Social Capital Dimensions	Intracorporate Network	Strategic Alliance	Industrial District
Structural			
Network ties	Fuzzy distinction between intramember and intermember ties	Intermember ties determining social ties within an alliance	Social ties as a foundation for intermember ties
Network configuration	Hierarchical, easy to establish connectivity between network members	Nonhierarchical, possibility of exploiting structural hole positions	Nonhierarchical and dense networks in a geographical region
Network stability	Stable membership	High rate of instability	Dynamic, with members joining and leaving the district
Cognitive			
Shared goals	Members working toward a common goal set by headquarters	Compatible goals but rarely common goals	Neither shared nor compatible goals
Shared culture	Overarching corporate culture	Cultural compromise/conflict among members	Industry recipe
Relational: Trust	Little risk of opportunism, institutional-based trust	Significant risk of opportunism, behavioral-based trust	Process-based personal trust



# GKMF Sample Metrics (Pawlowski & Bick, 2011)

Knowledge	Measurement of knowledge and core processes	<ul style="list-style-type: none"> <li>• Acceptance of knowledge management systems (KMS)</li> <li>• Usability / usefulness of KMS</li> <li>• Knowledge assets (number, usefulness, complexity, ...)</li> <li>• Knowledge sharing (number of knowledge elements, motivation, know</li> <li>• Knowledge utilization (usage of knowledge elements, number of users per element, perceived usefulness, ...)</li> </ul>
KM Project success	Success of specific KM projects	<ul style="list-style-type: none"> <li>• Project awareness and commitment</li> <li>• Project usefulness</li> <li>• KM effectiveness</li> <li>• KM process capabilities</li> <li>• KM infrastructure capabilities</li> <li>• Job performance</li> </ul>
Intellectual capital	General knowledge-related metrics of an organization	<ul style="list-style-type: none"> <li>• Human capital / knowledge development (no. of employees, employee turnover, profits / employee, motivation, satisfaction, ...)</li> <li>• Customer benefits (rating, sales / customer, satisfaction, length of customer relationship, response time, ...)</li> <li>• Structural capital (expense / revenues, errors / order, quality performance, ...)</li> <li>• Financial focus (assets / employee, revenues per new business operation, value added / employee, return on education, ...)</li> <li>• Process improvement (process timing, knowledge process time / total process time, ...)</li> <li>• Innovation (number of patents, improvement of product renewal, ...)</li> </ul>
Global Aspects	International aspects	<ul style="list-style-type: none"> <li>• See extra slides</li> </ul>

# Global KM metrics

- Derived from sample barriers and success factors (GKMF, Pawlowski & Bick, 2011)

Global aspects	Measuring international aspects	<ul style="list-style-type: none"><li>• Strategic partnerships / collaborations</li><li>• Communication intensity</li><li>• Coordination activities, coordination breakdowns</li><li>• Escalation procedures</li><li>• Management meetings</li><li>• Improvement of global competences</li><li>• Cultural awareness and sensitivity</li><li>• Team understanding, team awareness</li><li>• Imitations</li><li>• ...</li></ul>
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# Assessment Step by Step

- Starting point: Assessing barriers & success factors (e.g. using KnowMetrics)
- Develop assessment scheme
  - Focus on important aspects (critical processes / knowledge / barriers)!
  - Method (e.g. BSC, survey, self-assessment)
  - Aspects (Barriers, knowledge, project success, intellectual / social capital, global aspects)
  - If applicable: choose & design metrics
  - Develop instrument (e.g. questionnaires, tools, ...)
  - For analyzing relations and in-depth understanding of those: qualitative methods, e.g. expert interviews
  - Embed instrument as / with interventions
  - Define schedule
- Perform continuous analysis
- Share results on different aggregation level (e.g. KPI for management, qualitative analysis for managers)
- Evaluate assessment (did we measure what we intended to measure)



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# Summary

- Variety of methods, measures, metrics
- Levels of assessment, in particular
  - Overall performance
  - Project success
  - Knowledge development
- Focus on important aspects
  - Critical processes
  - Critical knowledge
  - Main barriers
- Careful instrument selection
  - What is the intended use of an instrument?
  - Combine quantitative (e.g. metrics) and qualitative (e.g., interviews) methods
- No one-fits-all instrument, especially for global aspects
- Reflect on the usefulness and efforts of the instruments

# Contact Information

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