

Performance Measurement of Communities of Practice

Dipl.-Wirtsch.Inf. Jörg Raimann
Lic. Oec. Marija Koehne
Dr. Andreas Seufert
Prof. Dr. Georg von Krogh
Prof. Dr. Andrea Back

Bericht Nr.: BE HSG / IWI3 / 16
Version: 1.0
Datum: 28.07.00

**Research Center
KnowledgeSource
University of St. Gallen
<http://www.KnowledgeSource.org>**



Institute for Informationmanagement
Prof. Dr. Andrea Back
Müller-Friedberg-Strasse 8
CH-9000 St. Gallen
Phone ++41 71 / 224-2545
Fax ++41 71 / 224-2716

IfB



Institute of Management
Prof. Dr. Georg von Krogh
Dufourstrasse 48
CH-9000 St. Gallen
Phone ++41 71 / 224-2356
Fax ++41 71 / 224-2355

Competence Center Knowledge Networks

Performance Measurement of Communities of Practice

Table of Contents

MANAGEMENT SUMMARY	8
1 KNOWLEDGESOURCE AND COMPETENCE CENTER KNOWLEDGE NETWORKS	10
1.1 RESEARCH PROJECT KNOWLEDGE NETWORKS	10
1.2 RESEARCH FRAMEWORK	11
<i>1.2.1 Knowledge Networks Reference Model</i>	<i>11</i>
A. Facilitating conditions	11
B. Knowledge work processes	12
C. Knowledge Network architecture.....	12
<i>1.2.2 Knowledge Networks Methodology.....</i>	<i>13</i>
A. Business Strategy	15
B. Knowledge Networks Reference Types	18
C. Knowledge Network Scorecard	21
2 BILATERAL PROJECT WITH DAIMLERCHRYSLER.....	23
2.1 PROJECT DESCRIPTION	23
2.2 PROCEEDING	23
2.3 TEAM STRUCTURE AND TIMEFRAME OF THE PROJECT	25
3 RESULTS: KNOWLEDGE MANAGEMENT AND MEASUREMENT	26
3.1 MEASUREMENT AND KNOWLEDGE MANAGEMENT	26
3.1.1 <i>Why measure?.....</i>	<i>26</i>
3.1.2 <i>Knowledge Management Measurement in companies: State of the art.....</i>	<i>26</i>
3.1.3 <i>Measurement requirements.....</i>	<i>29</i>
3.1.4 <i>Measurement methods.....</i>	<i>30</i>
3.2 THE BALANCED SCORECARD	36
3.2.1 <i>What is the Balanced Scorecard?.....</i>	<i>36</i>
3.2.2 <i>The Balanced Scorecard as a Strategic Management System.....</i>	<i>37</i>
3.2.3 <i>The Balanced Scorecard and Knowledge Management.....</i>	<i>38</i>
3.2.4 <i>Case studies.....</i>	<i>39</i>
A. American Management Systems.....	39

B. IC Navigator of Skandia.....	42
3.3 PERFORMANCE AND COMMUNITIES OF PRACTICE	46
3.3.1 Defining ‚Performance‘ for Communities of Practice.....	46
3.3.2 Impact of ‚enabling conditions‘ on performance	47
3.4 COMMUNITIES OF PRACTICE AND MEASUREMENT	49
3.4.1 Developing a Balanced Scorecard for Communities of Practice.....	49
3.4.2 The CC approach: Knowledge Network Scorecard and ‘Health Check’	50
3.5 PERFORMANCE MEASUREMENT AND INFORMATION	
AND COMMUNICATION TECHNOLOGY (ICT)	54
4 RESULTS: THE KNOWLEDGE MANAGEMENT COMMUNITY OF PRACTICE ON	
CORPORATE LEVEL AT DAIMLERCHRYSLER	59
4.1 DESCRIPTION OF THE COMMUNITY.....	59
4.1.1 Brief overview	59
4.1.2 Mission/Vision.....	60
4.1.3 Tasks and goals	60
4.1.4 Supported Business goals.....	61
4.2 DEVELOPING A BALANCED SCORECARD FOR THE	
KNOWLEDGE MANAGEMENT COMMUNITY OF PRACTICE	63
4.2.1 Levels of Measurement	63
4.2.2 Proceeding.....	64
4.3 PERFORMANCE INDICATORS	66
4.3.1 Performance Indicators for the goals/tasks	66
4.3.2 Performance lag indicators.....	86
4.3.3 Cause-and-effect relationships.....	88
4.3.4 Methods for measuring the performance indicators.....	89
4.3.5 Indicators for the „Functioning“ of the Knowledge Management Community	
of Practice.....	91
4.4 BALANCED SCORECARD FOR THE KNOWLEDGE MANAGEMENT	
COMMUNITY OF PRACTICE	92
4.4.1 Consolidating the performance indicators for the Balanced Scorecard	92
4.4.2 The (consolidated) Balanced Scorecard for the Community of Practice	
on Corporate Level about Knowledge Management.....	93
4.5 ALTERNATIVES TO BUILD AND ADAPT THE BALANCED SCORECARD	
IN DAIMLERCHRYSLER	95
4.5.1 Alternative 1: Plan for „best practice“ sharing to create synergies	
across Business Units	95
4.5.2 Alternative 2: Developing own Balanced Scorecard	97

5	IMPLICATIONS FOR DAIMLERCHRYSLER AND THE CC KNN.....	99
5.1	IMPLICATIONS FOR DAIMLERCHRYSLER.....	99
5.2	IMPLICATIONS FOR THE COMPETENCE CENTER KNOWLEDGE NETWORKS.....	100
6	APPENDIX.....	102
6.1	CONDUCTED INTERVIEWS: QUESTIONNAIRE.....	102
6.2	GENERAL SUGGESTIONS OF PERFORMANCE MEASURES.....	103
7	LITERATURE	106

List of Figures

Figure 1: Framework Knowledge Networks - a micro perspective	11
Figure 2: Knowledge process categories.....	12
Figure 3: Interrelation between Knowledge Network Reference Types and Business Goals	14
Figure 4: Building blocks of the procedural model.....	15
Figure 5: Knowledge Processes and Knowledge Network Reference Types.....	20
Figure 6: Examples of measurements	21
Figure 7: Way of proceeding.....	23
Figure 8: Structure of the project team	25
Figure 9: Good or excellent performance of knowledge activities	27
Figure 10: Biggest difficulties in managing knowledge	27
Figure 11: Answers to question about measurement practice in knowledge networks	28
Figure 12: Answers to question about measurement tools.....	29
Figure 13: Intangible Asset Monitor	32
Figure 14: Measuring knowledge management activities in companies: useable methods	35
Figure 15: The Balanced Scorecard [Kaplan/Norton 1992]	36
Figure 16: The BSC as a strategic management system	38
Figure 17: The Balanced Scorecard and Knowledge Management	39
Figure 18: Value Scheme (Skandia 1998).....	43
Figure 19: The IC Navigator (Skandia 1998).....	44
Figure 20: Knowledge Management barriers.....	48
Figure 21: BSC and process of community building.....	50
Figure 22: CC approach	51
Figure 23: Knowledge Network Health Check.....	53
Figure 24: Strategic Knowledge Networks.....	56
Figure 25: Knowledge Management Measurement as a component of an ICT architecture	58
Figure 26: Knowledge Management Community of Practice on Corporate Level	59
Figure 27: Levels of measurement	64
Figure 28: Proceeding of developing the BSC.....	65
Figure 29: Performance indicators overview	66
Figure 30: Lead and lag indicators	86
Figure 31: Cause-and-Effect Relationships	89
Figure 32: Consolidation of indicators	92

Figure 33: Balanced Scorecard for the Knowledge Management

Community of Practice 94

Figure 34: Alternatives to build and adapt the Balanced Scorecard in DaimlerChrysler ... 95

Figure 35: Alignment and coordination with common strategy and business units 96

Figure 36: Plan for common use of Knowledge Management best practices in order
to create synergies between business units 97

Figure 37: Alignment of Knowledge Management Community of Practice Scorecard 98

List of Tables

Table 1: Dimensions of performance 37

Table 2: Methods for community-based measurement 90

MANAGEMENT SUMMARY

This report is dealing with the topic of **Performance Measurement of Communities of Practice**. In particular the report delivers suggestions for the **performance measurement of the Knowledge Management Community of Practice on Corporate Level** at DaimlerChrysler. For that purpose, the development of a **Balanced Scorecard proposal** for the Knowledge Management Community of Practice has been a main task of the bilateral project.

In the first chapter we give a short overview of the Research Project 'Knowledge Networks' and its theoretical background, especially the **framework** of 'Knowledge Networks', the **procedural model** and its building blocks.

In the second chapter, the **goal of the bilateral project**, the **project definition** and the **proceeding** are described. The composition of the **project team** and the **timeframe** of the project can also be found in this section of the project report.

The third chapter at first introduces the topic of **measuring knowledge management activities**. We give here an overview of the **state of the art of Knowledge Management and Intellectual Capital Measurement** in companies on basis of an empirical study which has been performed by the Competence Center at the beginning of this year. Also an overview of **measurement requirements** and different useable **methods** is given.

Relating to the project topic, we then describe the **Balanced Scorecard** as a tool for performance measurement. Two cases of AMS and Skandia illustrate how the Balanced Scorecard can be used in the field of Knowledge Management and Intellectual Capital measurement.

In the next subchapter we discuss the topic of **performance of Communities of Practice** and the **impact of 'enabling conditions'** on community performance which includes cultural, technical and organizational issues. Further, we show how a Balanced Scorecard can be developed for a Community of Practice. The **approach of the Competence Center Knowledge Networks**, which includes a 'Knowledge Network Scorecard' and a 'Network health check', is also part of this chapter.

Chapter 3 finishes with some basic aspects of **performance measurement using ICT** (Information and Communication Technology).

Chapter 4 describes the **findings of the bilateral project that are specific for the Knowledge Management Community of Practice at DaimlerChrysler**. At first, we describe the **Knowledge Management Community of Practice and its tasks and goals**. Then we explain our **proceeding** how we have developed a Balanced Scorecard proposal for the Knowledge Management Community of Practice.

In subchapter 4.3 **performance indicators** are listed which specifically have been developed for the Knowledge Management Community of Practice at DaimlerChrysler. These per-

formance indicators are lead indicators to measure the activities of the Knowledge Management Community of Practice. In order to achieve a truly 'balanced' scorecard, we complemented them with performance lag indicators. Further, we explain some of the **cause-and-effect relationships** between them. In this section we also give some hints which **methods** can be used for measurement. Finally, subchapter 4.4 describes the **consolidation of the performance indicators** in order to achieve a Balanced Scorecard for the DaimlerChrysler Knowledge Management Community of Practice. In subchapter 4.5 we show two **alternatives how to build and adapt the Balanced Scorecard** in DaimlerChrysler.

Last not least, the report finishes with some implications that can be made for DaimlerChrysler as well as for the Competence Center Knowledge Networks.

1 KNOWLEDGESOURCE AND COMPETENCE CENTER KNOWLEDGE NETWORKS

1.1 Research project Knowledge Networks

The Competence Center Knowledge Networks is a research project within the Research Center **KnowledgeSource**, a cooperation of the Institute of Management (Chair of Prof. Dr. Georg von Krogh) and the Institute for Information Management (Chair of Prof. Dr. Andrea Back) at the University of St. Gallen (HSG). Within the framework of an international research co-operation with business and research partners, the objective of KnowledgeSource is to develop an integrated approach to Strategic and Information Management in order to achieve lasting competitive advantage through Knowledge Management.

The **Competence Center Knowledge Networks** (CC KNN) of KnowledgeSource was established 1998 in cooperation with our partner corporations Hewlett Packard, DaimlerChrysler, Lotus Professional Services, and Unilever. It focuses its research activities towards an integrated view of Knowledge Management and networking. The main objectives of the Competence Center Knowledge Networks are to establish a shared understanding, a reference model and a methodology for high performing Knowledge Networks. 'High performing' means to support specific business goals through Knowledge Networks effectively and efficiently. These results aim to support our partner corporations in the process of establishing, recognizing, and facilitating Knowledge Networks within their organizations. To achieve this goal the reference model and the methodology are mainly based on academic research work, bilateral projects with our partner corporations as well as case studies from reputable organizations.

This paper will elaborate our understanding of Knowledge Networks, the findings of our second bilateral project with DaimlerChrysler and the contribution of the bilateral project to the overall research question on Knowledge Networks.

Before describing the bilateral project with DaimlerChrysler, our initial framework of Knowledge Networks should be introduced.

1.2 Research Framework

1.2.1 Knowledge Networks Reference Model

The initial framework of Knowledge Networks comprises the following components:

- *Actors* – individuals, groups, organizations *relationships between actors*, which can be categorized by form, content and intensity,
- *resources* which may be used by actors to network with other individuals, groups or organizations, and
- *organizational properties*, including structural and cultural dimensions such as control mechanisms, standard operating-procedures, norms and values, communication patterns, etc.

These components can be perceived from either a static or a dynamic point of view. From a micro perspective, we conceptualize Knowledge Networks on the following three building-blocks (see figure 1):

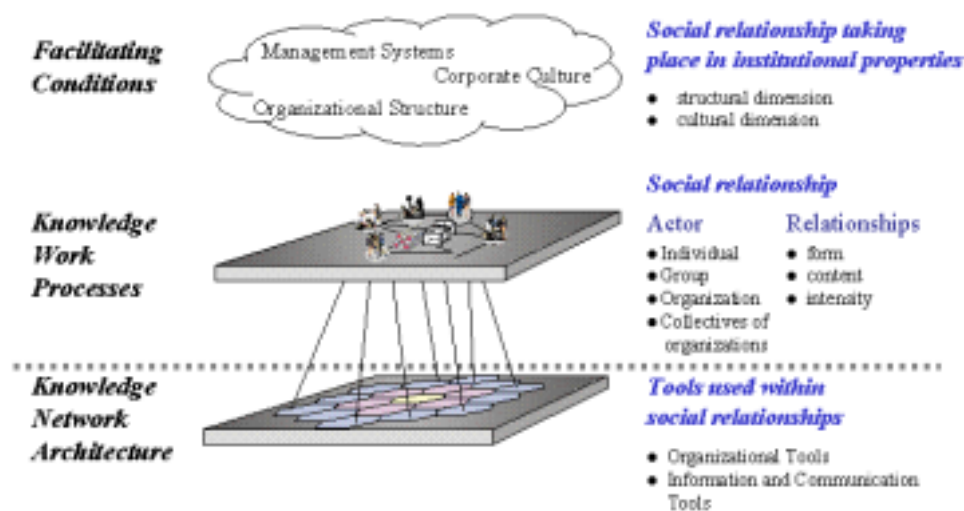


Figure 1: Framework Knowledge Networks - a micro perspective

A. Facilitating conditions

In our understanding Knowledge Networks are rather an additional, cross-divisional, dynamic layer than a new kind of organizational structure. In this regard, one needs to take into account the interdependence of Knowledge Networks as well as their role within their existing organizational units. In order to develop high-performing Knowledge Networks they have to be synchronized by facilitating conditions, which we divide into structural (e.g. organizational structure, management systems) and cultural (e.g. corporate culture, organizational behavior) dimensions.

From within Knowledge Networks (micro perspective) facilitating conditions comprise the network's internal structural and cultural dimensions in which knowledge work processes take place. Therefore, they define the enabling or inhibiting environment for knowledge creation and transfer.

B. Knowledge work processes

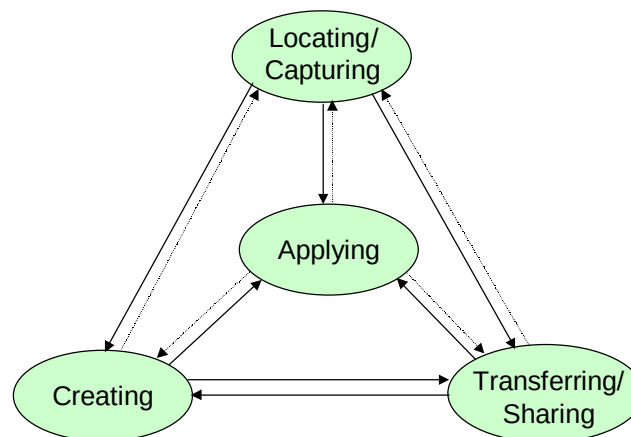


Figure 2: Knowledge process categories

In our reference model we define Knowledge Work Processes in terms of locating and capturing knowledge, transferring and sharing knowledge as well as knowledge creation (see *figure 2*) as our main categories. The bottom line for all categories is the application of existing or new gained knowledge to create value for the customer and therefore for the organization itself. In our model of Knowledge Work Processes the application of knowledge takes the center role to indicate the knowledge should not be managed per se, but it needs to be tightly connected to business drivers.

C. Knowledge Network architecture

Knowledge Network Architecture, finally, comprises the tool-set used within social relationships. These tools include organizational tools, e.g., roles like the knowledge activists [von Krogh/Nonaka/Ichijo 1997] as well as information and communication tools (ICT), e.g., the groupware-enabled data warehouse concept [Seufert 1997] used to enable and improve knowledge work processes [Nonaka/Reinmoeller 1998].

This architecture is not only a collection of modular tools. In the form of “solution frameworks” we want to link architectural designs that are a combination of ICT and organizational tools and methods with the knowledge work processes level.

1.2.2 Knowledge Networks Methodology

Whereas the reference model performs the basic understanding, the methodology provides a blueprint for developing knowledge networks. In the following we describe the building blocks of this methodology.

Our model consists of the following three building blocks:

- **Business Strategy**
- **Knowledge Network Types**
- **Knowledge Network Scorecard**

Knowledge is a key resource in order to achieve competitive advantage. Therefore our model comprises the **business processes**, which are derived from the **business strategy**.

Strategy serves in this perspective as a starting point for defining the requirements that have to be fulfilled by a Knowledge Network. Additionally, especially in practice a concrete task or process might serve as a starting point, too. Within our research we identified the business goals **risk reduction**, **efficiency improvement** and **increasing innovation**.

Knowledge Networks are the organizational environment in which Knowledge Management activities take place. They consist of 3 layers, the knowledge work processes, the knowledge network architecture to support these processes and the facilitating conditions, that is the environment in which the knowledge processes - embedded in business processes - occur. Research has shown that there are different types of Knowledge Networks that can be identified and described by different characteristics. These “Knowledge Network Reference Types” (see 1.2.2.B) may serve as blueprints for building a Knowledge Network.

Since Knowledge Networks are the organizational environment where knowledge processes take place in order to achieve the business goals derived from strategy there has to be an intersection between Business Strategy and the Knowledge Network Reference Types. One should bear in mind that this interrelation is reciprocal.

On the one hand, starting with a market based perspective, business strategy defines the business goals that have to be addressed by Knowledge Networks, on the other hand these business goals have to be achieved with a certain set of resources represented by the Knowledge Network (Knowledge Network Reference Types hereby serve as a blueprint in order to get an impression of the resources required).

According to strategy, business goals and the derived tasks that have to be executed, a **different Knowledge Network reference type** with specific characteristics (e.g. size, roles etc.) becomes relevant.

Coming from a resource based perspective, one could also start choosing a Knowledge Network Reference Type based on the company's available resources and adjust the Knowledge Network characteristics in order to meet specific business goals.

This leads to a **matrix of business goals and network reference types** as the following figure illustrates:

Knowledge operational task Business Goals	implicit to implicit	implicit to explicit	explicit to explicit	explicit to implicit
Efficiency				
Innovation	Type 1	Type 2	Type 3	Type 4
Risk				

Figure 3: Interrelation between Knowledge Network Reference Types and Business Goals

Based on this decision the company starts setting up the Knowledge Network and uses the Knowledge Network Reference Type as a blueprint.

The **Knowledge Network Scorecard** finally measures the impact of the implemented Knowledge Network. The Knowledge Network's performance is measured by the output of the business process, which in turn is determined by the degree of goal achievement. Hereby we suggest a system that measures the output of the Knowledge Network in respect to the initial business goal, integrating quantitative and qualitative factors.

The following figure gives an overview of the building blocks and their interconnections.

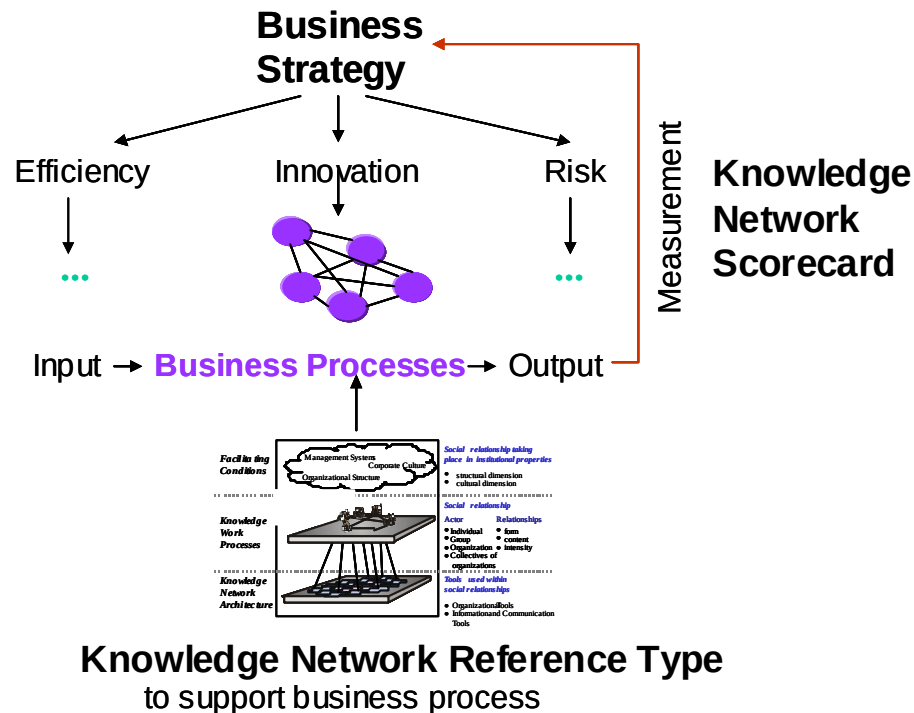


Figure 4: Building blocks of the procedural model

A. Business Strategy

Modern management doctrine has shown in theory as well as in practice, that it is especially middle- and long-term goals, like efficiency improvement, increased innovation and risk optimization [von Krogh et al., 1999], that lead to sustainable competitive advantage [Porter, 1985; Bleicher, 1991 and Prahalad; Hamel, 1990]. There are also many indications in the literature that the discipline of Knowledge Management is most successful, when it comes to middle- and long-term goals [Nonaka; Takeuchi, 1997; von Krogh; Roos, 1996; Senge, 1996 and von Krogh; Venzin, 1995]. The aim of the strategic goals is to give an orientation when developing and choosing a strategy, especially a knowledge strategy. Through the alignment of the knowledge advancement activities with the overall, for all the business units coherent strategic goals, it can be made sure, that the local efforts help fulfill the strategy of the company. It is also our aim to classify Knowledge Networks according to these business goals. In the following the three strategic goals: “*efficiency improvement*”, “*increased innovation*” and “*risk optimization*” will be discussed.

The main focus at **efficiency improvement** is to reduce the costs in the existing business processes quicker than the competitors. On company level, it is about achieving higher efficiency by increasing the value of the output compared to the costs of the input. For many companies one of the biggest challenges is to improve their business processes and then transfer them to other parts of the company [von Krogh et al., 1999]. *Texas Instruments* was

in the beginning of the 90's confronted with the problem of regular delays at delivering its products. In order to solve this problem, a project was established to search for best practices inside the company. Through the transfer of these best practices between the various units of the company, it was possible not only to minimize delays, but also to reduce the delivery costs [O'Dell; Grayson, 1998]. Increased efficiency in operation can also mean improving the speed of processes, getting the "right" types and amount of processes, having improved decision making and increased responsiveness to customers. It is also essential in this respect to learn from partners, competitors and oneself how to manage the business processes more efficiently.

The goal of **risk optimization** concerns mainly risk associated with investments and the running business. Many companies face at least two main risks: (1) political risk and (2) competitive risk [von Krogh et al., 1999]. The *political risk* is a result of uncertainty regarding political decisions. Especially for international companies, this can present a big challenge, since national governments can often take unexpected decisions, which cannot be influenced by the company. Competitive risks depend on the uncertainty surrounding the actions and reactions of existing competitors as well as the emergence of new competitors. Since many companies operate in more than one market and because of the erosion of the boundaries of these markets, it becomes increasingly difficult to anticipate such changes. In order to reduce its competitive risks, the German company *Aerospace* created a program for simulating possible scenarios for future environmental conditions in its core businesses. The managers in the company can learn this way to see and understand the complexity and interplay of environmental conditions that can have an effect on their business [Schüppel, 1996]. Thus, new knowledge about alternative future scenarios and the functions in the competitive environment is created, reducing the competitive risk of the company. Other risks a company might face are:

(1) Information risk, which is the risk of not having the correct information at the right place at the right time. (2) Knowledge risk, which is the risk of employees exhibiting knowledge deficiencies. (3) Financial risk, which is the risk of the business not managing its finances appropriately. (4) Human risk, which is the risk that the business does not employ the right people for the tasks and that the people with valuable knowledge leave. (5) Derived demand risk, which is the risk that the business either misunderstands or ignores potentially profitable new technologies, or does not engage in sufficient innovation to offset future competition. (6) Communications risk, which is the risk that the business does not communicate its accomplishments to the market and to the other stakeholders. (7) Customer risk, which is the risk that customers are not correctly managed, that customer satisfaction decreases thereby resulting in lower repeat business and referred business. (8) Structural risk, which is the risk

that the business cannot support current management initiatives due to a deficient structure. (9) Resource risk, which is the risk of not having the resources to implement your strategy. Managing the companies risk exposure can also mean capturing the knowledge of experts before retirement, avoiding over-taxing local resources by transferring key personnel on demand and learning from your projects in order to avoid repeated mistakes.

Increased innovation is about improving ones competitive position, through the development of product-, service- and process-innovations [von Krogh et al. 1999]. Innovations are mostly based on procedural knowledge and cultural conditions, which cannot be imitated directly by the competitors. Procedural knowledge is knowledge that has something to do with the generic innovation processes. Such a process consists of different phases, like concept development, evaluation and selection of alternatives or developing prototypes [Nonaka; Takeuchi, 1995]. Cultural conditions encompass shared values and modes of behavior within the company [von Krogh et al., 1998]. For bigger companies with many business units, there is the challenge of leveraging their procedural knowledge in developing different innovations throughout the company, thus achieving a sustainable competitive advantage. Ultimately innovation is about creating new sources of revenues through new products and services. In the long run companies ought to develop a culture that advances innovation. The innovation culture serves the development of many different products within a short period of time“ [Widmer, 1999]. Following the discussion of the strategic business goals, we will now turn our focus to the central knowledge processes and the evolution of Knowledge Management. For innovation it is essential to capture new business process and innovation ideas throughout the companies, to adapt a new product or marketing instrument to another part of the company and to create in depth knowledge to develop radical innovation and process improvements.

B. Knowledge Networks Reference Types

Our Knowledge Network Reference Types are characterized by the “knowledge operational task” they are pursuing. Knowledge operational tasks are the transformation of knowledge into explicit or tacit form. This refers to Nonaka [Nonaka/Konno 1998], and the SECI model, which describes the four conversion modes from tacit to tacit, tacit to explicit, explicit to explicit and explicit to tacit knowledge. According to Nonaka all four conversions are necessary for the creation of knowledge. “Each of the conversion modes can be understood as processes of self-transcendence, as every conversion involves transcending the self of individuals, teams or organizations” [Nonaka/Reinmöller 1998].

The individual processes socialization, externalization, combination and internalization are taking place over and over again through both levels, the individual as well as the group level however with different intensity and quality [Nonaka/Takeuchi, 1995].

Sozialization comprises the exchange of tacit knowledge between individuals in order to convey personal knowledge and experience. Joint experience results in new shared implicit knowledge, such as common values or technical skills. In practice, this could mean, for instance, gaining intuitive and personal knowledge through physical proximity and having direct communication with customers or a supplier.

Externalization describes another transformation process. On the one hand, this means the conversion of implicit into explicit knowledge, and on the other, the exchange of knowledge between individuals and a group. Since implicit knowledge is difficult to express, the conversion process is often supported by the use of metaphors, analogies, language rich in imagery, or stories, as well as visualization aids, like models, diagrams or prototypes. In order to stage a constructive discussion and reach creative conclusions, a deductive or inductive mode of argumentation is also very important.

The transformation of explicit knowledge into more complex and more systematized explicit knowledge represents the knowledge operational task *combination* (recently *Nonaka* renamed this stage *Systematization*, Nonaka, 1999). It is necessary to combine different fields of explicit knowledge with each other and make new knowledge available on an organization-wide basis. The systematization and refinement increases the practical value of existing knowledge and increases its transferability to all organizational units.

Internalization comprises the conversion of organization-wide, explicit knowledge into the implicit knowledge of the individual. This requires from the individual that she/he should be able to recognize personally relevant knowledge within the organization. Continuous learning and the gathering of one's own experience through "learning-by-doing" may support employees in these internalization processes. In this way both capabilities and skills ("know-how") as well as firm visions and guidelines may be internalized and therefore shared throughout the whole company. This tacit knowledge and the experience gained on an individual level can be shared again through socialization-processes between individuals, so that the knowledge spiral may be set in motion once more.

When cultivating the relationships that are the basis for these knowledge operational tasks we will take into account the transformational effects that information and communication technology can have for the form and intensity of communication, cooperation and coordination within Nonaka's four knowledge spiral process categories. His concept of "Ba" [Nonaka/ Konno 1998] is a step into that direction, but that is not yet a comprehensive view of how new media effects these processes.

It further is important to note here that in all these exchange processes new knowledge is created [Nonaka/ Konno 1998]. To create new knowledge the Knowledge Working Processes locate, capture, transfer and share have to take place.

Referring to Nonaka we have identified four **Knowledge Network reference types** which we have named as Materializing Network, Experiencing Network, Resystematizing Network and Learning Network .

Starting from this framework it will be possible to provide a more detailed judgment regarding design potentials. In contrast to Nonaka [Nonaka/ Konno 1998], our research showed that within Knowledge Networks knowledge transformation processes do not always occur in this order. We identified that each Knowledge Network pursues a main transformation process. This main transformation process of a Knowledge Network we name *knowledge operational task*. For example, in a Knowledge Network where explicit knowledge is exchanged the main knowledge operational task is the transformation from explicit to explicit knowledge.

Further, the initial model of the knowledge spiral for networks has to be modified according to the needs of assigning a certain type of network to a specific task. Also the knowledge spiral becomes irrelevant, since we do not conceptualize the development of networks through the knowledge transformation phases. Building on the model of structuration theory, a differentiation can be made between the generic knowledge processes, meaning the interactive muta-

tion of implicit and explicit knowledge (knowledge transformation), and the structuration of the institutional framework conditions, meaning the building and design of the network (network building).

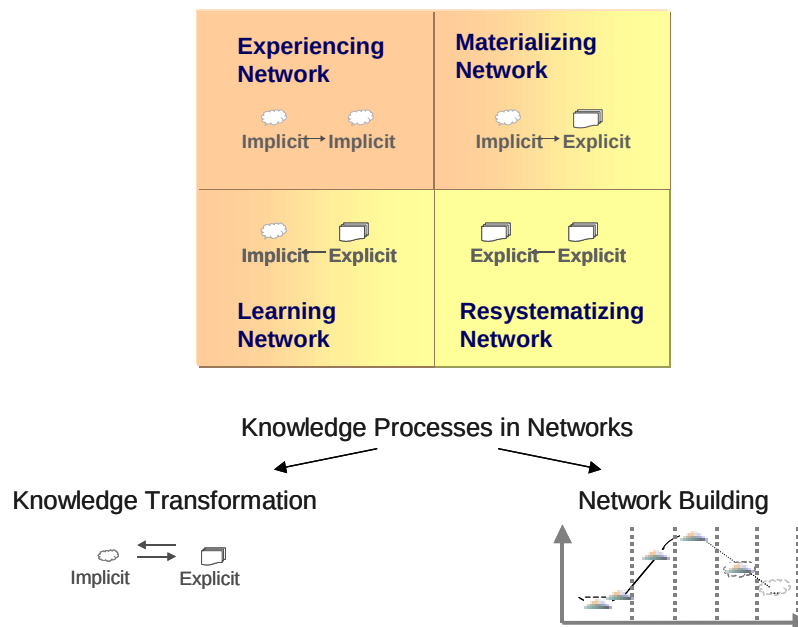


Figure 5: Knowledge processes and Knowledge Network Reference Types

In order for implicit knowledge to be exchanged, as in Knowledge Network reference type 'Experiencing', it first needs to be identified, so as to be internalized through adaptation and model-learning. Knowledge Network reference type 'Materializing', in turn, deals with the process of identifying implicit knowledge, with its transformation into explicit knowledge being defined by concept- and model-learning and by the exchange of this explicit knowledge. Knowledge Network reference type 'Resystematizing' focuses the identification of already explicitly available knowledge that is interconnected and prepared for decision making, hence, (re-) organized and then distributed. Finally, Knowledge Network reference type 'Learning' can be thought of as a Network dealing with the identification of explicit knowledge and the internalizing thereof, in order to apply it in concrete circumstances.

As research has shown, knowledge processes build the heart of Knowledge Networks. In order to meet the goals of the business processes by supporting specific knowledge processes efficiently, appropriate facilitating conditions and tools have to be in place. This means that knowledge work processes, knowledge network architecture and facilitating conditions have to match. Serving as a blueprint, Knowledge Network reference types can be used to identify "ideal" forms and arrangements in order to contribute to specific business goals, i.e.

supporting key business processes and accordingly having the appropriate facilitating conditions and knowledge network architecture in place.

C. Knowledge Network Scorecard

The purpose of the Knowledge Scorecard is to measure the impact of the Knowledge Network on the achievement of the business goals risk reduction, efficiency and innovation. Based on performance indicators we are developing a measurement model that brings these measures into a coherent framework. The following figure gives some examples of possible measures according to the aimed business goal.

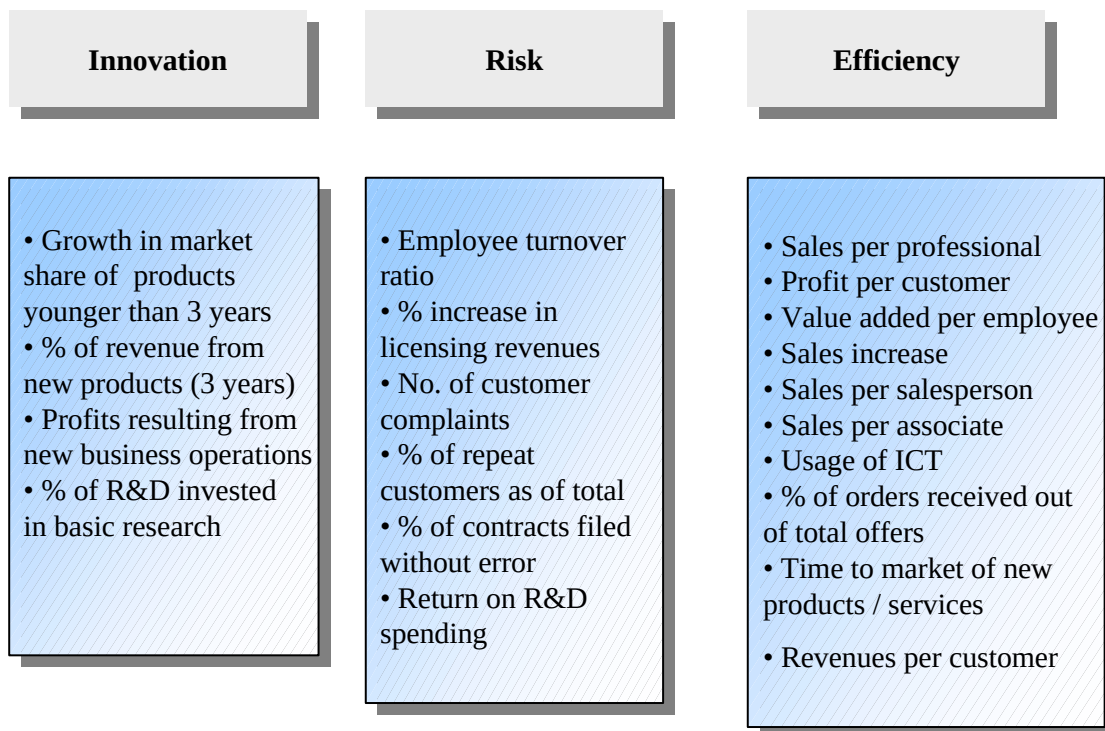


Figure 6: Examples of measurements

Performance measures should have a certain set of characteristics. It is very important to have *cause and effect relationships*. Every measure selected should be part of a chain of cause and effect relationships that represent the strategy. It is also very important to identify the *performance drivers*. Measures common to most companies within an industry are known as “lag indicators”. Examples include market share or customer retention. The drivers of performance (“lead indicators”) tend to be unique because they reflect what is different about the strategy. A good measurement system should have a mix of lead and lag indicators. Performance indicators help determine *how* something is achieved, and should be particular, context-dependent measurements, self defined by the networks. They should also be simple,

understandable and use existing systems and processes rather than introducing artificiality or unnecessary complexity. They furthermore create a language for a shared understanding of local activities throughout the company, which is very important. A challenge, that has to be dealt with is that they also influence and shape behavior. Finally the measures should be *linked to financials*. With the proliferation of change programs underway in most organizations today, it is easy to become preoccupied with a goal such as quality, customer satisfaction or innovation. While these goals are frequently strategic, they also must be translated into measures that are ultimately linked to financial indicators. Still, with performance indicators for intellectual capital, *direction* is more important than precision, since essentially *approximations* are valued.

In order to have a successful measurement system, one should follow certain steps. Firstly, it is important to develop a greater *awareness and understanding* of the role of knowledge and the nature of intellectual capital. Secondly, the creation of a *common language* that is more widely diffused within their company is necessary, e.g. using terms such as “human capital”. In addition to this, it is essential to identify *indicators* that are suitable and appropriate and to develop a *measurement model*, that brings these indicators into a coherent framework. Finally, one should introduce *measurement systems*, including the accompanying management processes that guide and reward managers and maybe use objective impartial consultants and surveys to carry out key aspects of the measurement process.

2 BILATERAL PROJECT WITH DAIMLERCHRYSLER

2.1 Project description

The second bilateral project between DaimlerChrysler AG and the CC Knowledge Networks of the KnowledgeSource St. Gallen started with a kick-off meeting in Stuttgart in February 2000 where the project goal was fixed. The following project was defined: "Definition von quantitativen und qualitativen Messgrößen zur Leistungsmessung von Communities of Practice auf Basis des Balanced Scorecard-Ansatzes am Beispiel der 'CoP über Wissensmanagement auf Konzernebene' (in original language). This means: "Definition of quantitative and qualitative measurement variables for the performance measurement of Communities of Practice on the basis of the Balanced Scorecard approach using the example of the 'CoP about knowledge management on Corporate Level'.

Resulting from this project, there were two important issues to consider: On the one hand, the focus should be on a general discussion of measurement methods and especially of the measurement method Balanced Scorecard. On the other hand, the project should deliver very concrete indications for measuring the performance of the defined community for which a Balanced Scorecard should be developed.

2.2 Proceeding

Resulting from the two major goals of the bilateral project, namely to discuss measurement methods - in general as well as in a special case - and to develop a Balanced Scorecard for the defined community, the following proceeding was defined:

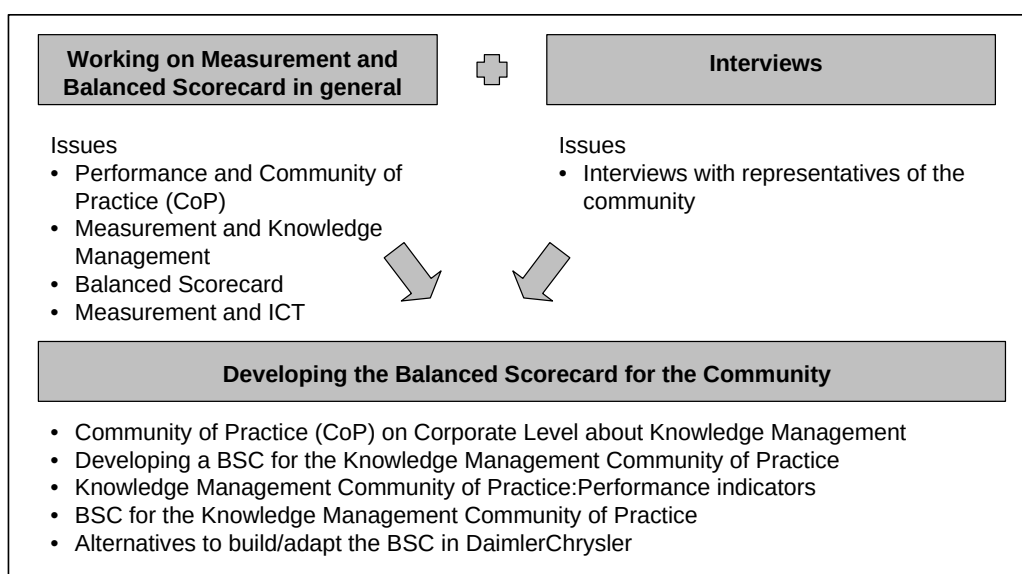


Figure 7: Way of proceeding

For achieving the first goal, it was important to work on issues as general considerations regarding performance and communities and resulting problems in measuring it, as surveys on measurements and measurement methods as well as their use in practice. Furthermore, it seemed to be relevant for us to discuss the basics and the implications of a Balanced Scorecard as well as to take into consideration the role of ICT in the performance measurement area. For achieving the second goal, results from defined first goal could be used and were helpful for achieving the second goal while discussing them on a more concrete level. Together with insights from interviews, they were the basis for achieving the second goal. Therefore, the Community of Practice on Corporate Level about Knowledge Management and their goals and tasks were discussed. Then, building on the goals of this community the Balanced Scorecard was built: for each task/goal measures/performance indicators were identified. After this step, all the performance indicators have been consolidated to achieve the final Balanced Scorecard. Besides this, insights were built for issues like measuring methods and measuring the state and 'functioning' of a community. In the last part of this project report, alternatives to build/adapt the proposed Balanced Scorecard are shown.

2.3 Team structure and timeframe of the project

2.3.1 Team structure

The team for the bilateral project between DaimlerChrysler and the Competence Center Knowledge Networks of the University of St. Gallen was composed by the following members:

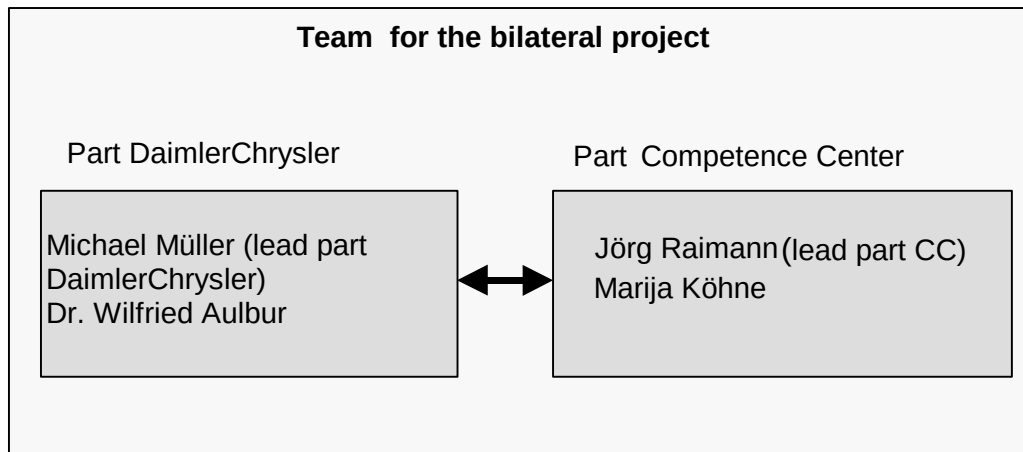


Figure 8: Structure of the project team

2.3.2 Timeframe

The kick-off meeting took place at the 21st of February 2000. At this meeting, it was agreed to realize the bilateral project in the timeframe between the 1st March and the 30th of April 2000. In the following, in accordance with DaimlerChrysler the schedule was changed a little bit and then looked the following way:

- Project start: 1st March 2000
- Progress report till the 19th April 2000
- Interviews: during the project work (in April and May)
- Finalization of the results till the end of May 2000.

3 RESULTS: KNOWLEDGE MANAGEMENT AND MEASUREMENT

3.1 Measurement and Knowledge Management

3.1.1 *Why measure?*

More and more, companies understand that knowledge is fundamental for companies regarding their working and their goal achievement. They are on the way to understand that knowledge is the most important resource – embedded in employees, captured in procedures and tools etc. – which can be converted into value. However, it is very hard to observe and to measure knowledge and related knowledge management activities.

Today, measurement methods still are tied to capital and financial issues. Vassiliadis [2000] states:

“The introduction of the concept of value added met the essence of modern and future business activities of a company: the domination of input (costs) gave way to output (created value). However, the present accounting system, although improved by ABC and EVA, has remained closely tied to capital employed and financial capital flows. Thus it does not include what is crucial for contemporary business, information on the performance of intellectual capital.”

However, measuring knowledge is important to shift the way to issues of knowledge and value creation through knowledge. Vassiliadis [2000] remarks:

“Although intangible assets may represent competitive advantage, organizations do not understand their nature and value [Collins 1996]. Managers do not know the value of their own IC [knowledge]. They do not know if they have the people, resources or business processes in place to make a success of a new strategy. They do not understand what know-how, management potential or creativity they have access to with their employees. Because they are devoid of such information, they are rightsizing, downsizing and reengineering in a vacuum.”

3.1.2 *Knowledge Management Measurement in companies: State of the art*

There are some sources to find implications on the state of the art regarding knowledge management measurement attempts in companies. One interesting resource is Ruggles [1998]. Ruggles wants to give a state of the notion what knowledge management means in practice after he examined the results of a study of 431 U.S. and European organizations, which originally was conducted in 1997 by Ernst & Young. One issue examined was, which knowledge management activities were on the way and how executives thought of their successes and performance (see *figure 9*, Source: Ruggles 1998). Resulting from this, measuring knowledge and knowledge management activities seems very hard and difficult for companies.

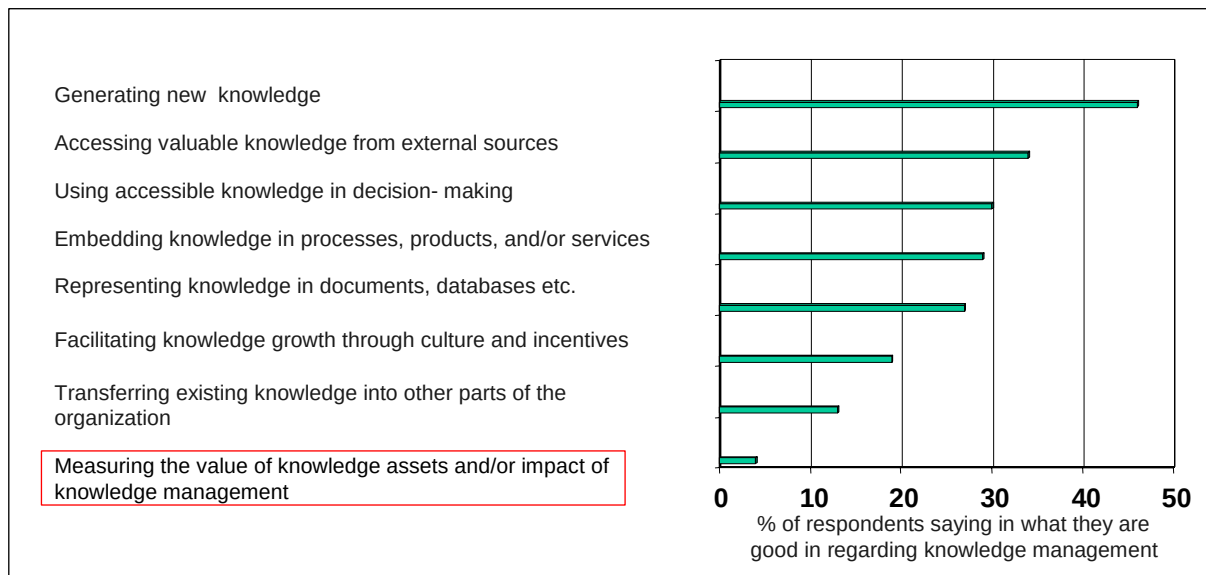


Figure 9: Good or excellent performance of knowledge activities

Another issue Ruggles [1998] examined was the question about the biggest difficulties in managing knowledge in their organizations. Again, the result was, that measuring knowledge is one of the hardest knowledge management activity for companies. The following figure 10 (Source: Ruggles 1998) shows the results:

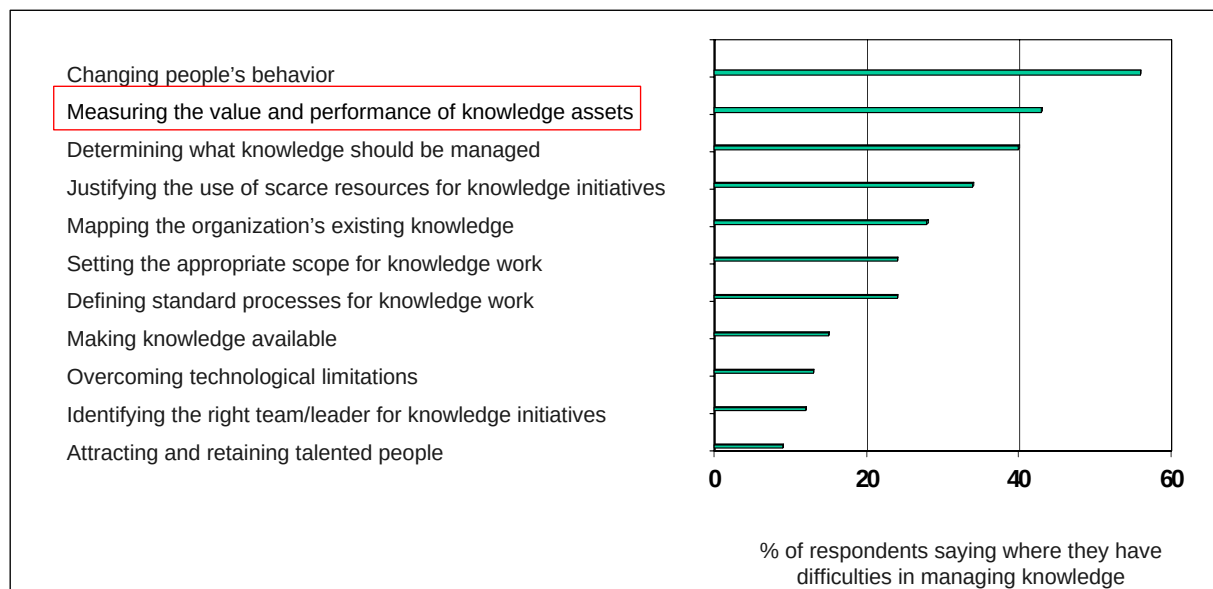


Figure 10: Biggest difficulties in managing knowledge

Another source for obtaining insights in the state of measuring knowledge in companies is a survey conducted by the Competence Center Knowledge Networks [KnowledgeSource 2000a]. This survey was conducted in 2000 and was designed to get answers about knowledge management activities in companies in general and especially regarding issues on knowledge networks in companies. More than 180 questionnaires were sent to the most admired companies in terms of Knowledge Management and to companies with a high degree of Knowledge Management. Resulting from this survey, it could be observed that knowledge is rarely measured in companies (respectively in knowledge networks) and tools for measuring knowledge like knowledge balance/audit tools are rarely used.

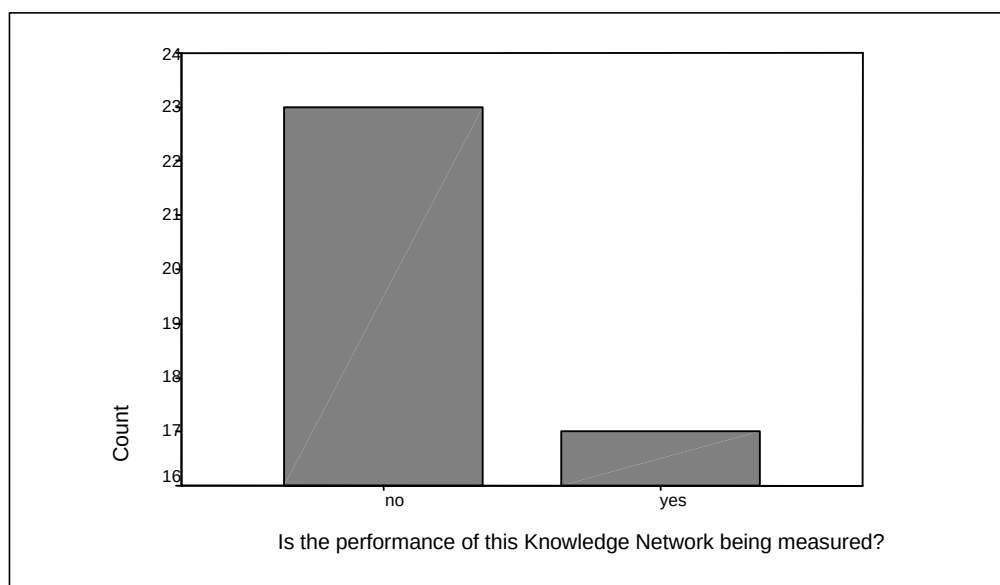


Figure 11: Answers to question about measurement practice in knowledge networks

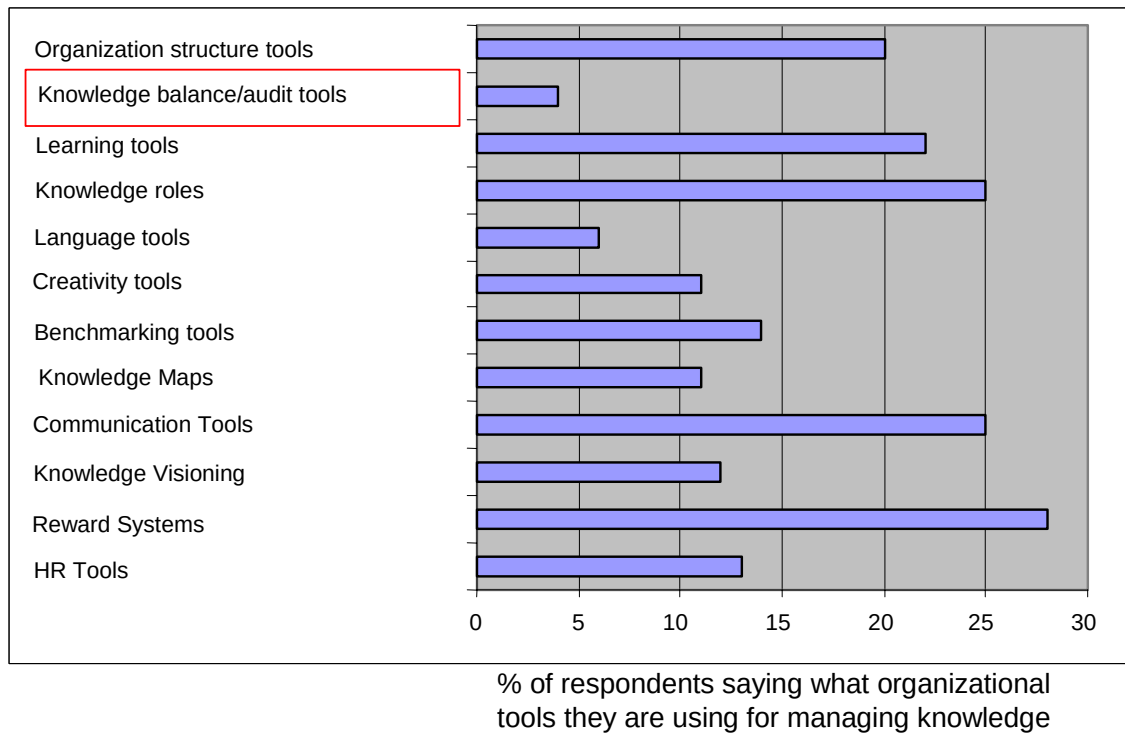


Figure 12: Answers to question about measurement tools

3.1.3 Measurement requirements

A measurement method should fulfill several requirements in order to be usable and practical enough for those who want to use measures. Some of these measurement requirements are:

- Measurement should not stand in contradiction to enabling conditions.
- Measurement has to be transparent.
- Measurement should be based on realistic goals.
- Quantitative and qualitative measures should be considered.
- Measurement should be linked to skill building and reward and incentive systems.

3.1.4 Measurement methods

Even the task of measuring knowledge is not easy and as showed above is often neglected in companies, it nevertheless is an important task. In the last years, many firms/academics tried to develop measurement methods in which knowledge is measured besides other resources or where the focus is laid totally on measuring knowledge. From these activities resulted an increased number of methods for measuring knowledge. However, they base on different concepts and there is no method accepted as the only right one. In the following, many of these methods will be presented shortly to provide an overview and show their key idea.

For measuring knowledge and knowledge activities, there exist **direct** or **indirect** methods. Indirect measurement means to conclude measures/indicators for knowledge and knowledge activities from secondary indicators (e.g. financial indicators) whereas direct measures try to measure 'knowledge' itself [for this distinction see Hein 1996]. Regarding this distinction, the methods which will be presented shortly in the following can be assigned as follows:

Indirect measurement methods:

- Tobin's q

Tobin's q is based on observations that knowledge-intensive companies are valued higher on the market as they are valued on tangible assets and that the market recognizes the value of intangible assets [see in the following Quinn 1992]. Therefore, Tobin's q calculates the difference between the book value of a company and the replacement cost of the companies assets and expresses this with the value of intangible assets.

Tobin's Q:

$$\text{Value of intangible assets} = \text{Market value} - \text{Replacement Value of tangible assets}$$

- Management Value-Added

This measurement method by Strassmann stresses the importance of management activity [see for this method Strassmann 1996]. Strassmann defines the knowledge capital as the result of management value added (which is left after all costs are accounted for) in relation to the price of capital.

Management value added:

$$\text{Knowledge capital} = \frac{\text{Management Value Added (what is left for after all cost are accounted for)}}{\text{Price of Capital}}$$

- Calculate Intangible Value

This method strongly builds on insights of brand equity calculations where the premium supplied by the brand equals the asset value of this brand [see Vassiliadis 2000]. The calculated intangible value method builds on a seven step-process in which different ratios and measures are calculated and in which the calculation of intangible assets (step 6) bases on the measures and ratio's calculated before. Therefore, the premium of intangible assets (after tax) is:

Calculated Intangible Value:

$$\text{Premium of intangible assets (after tax)} = [\text{Pretax earning} - (\text{Industry average of Earnings/Assets} * \text{Average tangible assets})] * (1 - \text{tax rate})$$

Direct measurement methods:

- Balanced Scorecard

This quite well-known method builds on insights of Kaplan/Norton. Kaplan and Norton [1997] suggest a scorecard with four perspectives which are the perspectives financial, customer, internal processes as well as learning and growth. This method - since it builds the basis of the bilateral project - will be described in more detail in chapter 3.2.

- Intangible Assets Monitor

This measurement method was developed by Sveiby. Sveiby [for the following see Sveiby 1996] distinguishes between tangible assets in companies like cash, accounts receivable and equipment, office and space and between intangible assets as external structure, internal structure and competence of the personnel. The Intangible Assets Monitor tries to measure these intangible assets external structure, internal structure and competence of the personnel by using a further distinction of indicators of growth/renewal, indicators of efficiency and indicators of stability. The Intangible Asset Monitor could look the following way [Source: Sveiby 1996]:

	External Structure Indicators	Internal Structure Indicators	Competence Indicators
Indicators of Growth/Renewal	• profitability per customer • organic growth • image enhancing customers	▪ investment in IT ▪ structure-enhancing customers	▪ number of years in the profession ▪ level of education ▪ training and education costs ▪ marking ▪ competence turnover ▪ competence enhancing customers
Indicators of Efficiency	• satisfied customer index • sales per customer • will/loss index	▪ proportion of support stuff ▪ values/attitudes index	▪ proportion of professionals ▪ leverage effects ▪ valued added per employee ▪ profit per professional
Indicators of Stability	▪ proportion of big customers ▪ age structure ▪ devoted customers ration ▪ frequency of repeat orders	▪ age of the organization ▪ support staff turnover ▪ rookie ratio ▪ seniority	▪ professionals turnover ▪ relative pay ▪ seniority

Figure 13: Intangible Asset Monitor

- Deferred Labor Cost

This method bases on the thinking that salaries are partly an investment (and not just costs) for the company [see for this method RSA Inquiry 1995]. Therefore, sales revenues after expenses are accounted of as well as R&D value added are important.

Sales revenues - Overhead - Capital spending - Expensed labor + R&D value added = Surplus (Banked Knowledge [=Labor costs considered knowledge assets+ R&D value added]+Cash)
--

- Human Resource Accounting

There exist several categories of measurement methods and certainly different measurement methods [see Hein 1996]. One of this methods is the Stochastic Rewards Valuation Model which measures the expected conditional and realizable value of an individual to an organization [see for this method Flamholtz 1989].

Management Stochastic Rewards Valuation Model:

Expected realizable value stemming from the following steps:

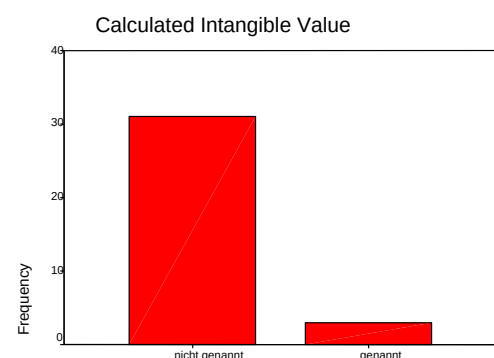
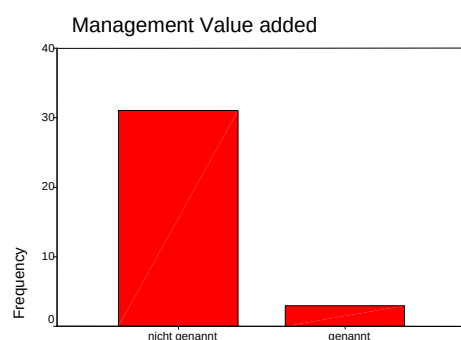
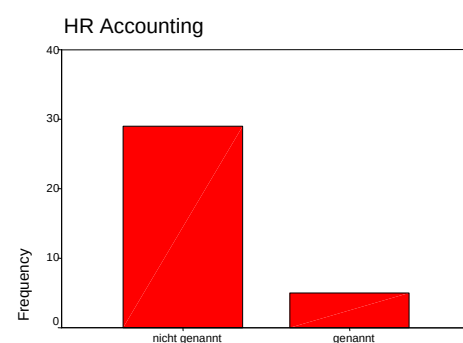
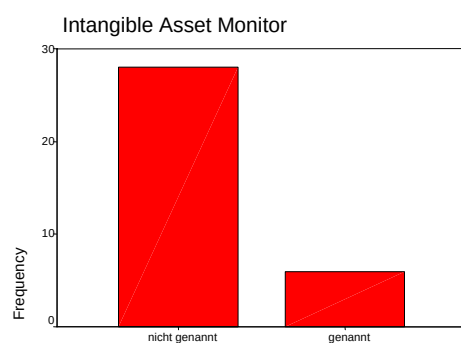
- a) definition of service states (job)
- b) determination of value of each state to the organization
- c) estimation of tenure in organization
- d) probability of occupying states
- e) discounting future cash -flows

However, there also exist other methods for measuring intellectual assets. The Montague Institute names techniques that could be used to value intangible assets [the following part is taken from the article by Montague Institute 1998]:

- Relative value:
Here the progress and not the quantitative approach is the ultimate goal (e.g. high percentage of employees are involved with customers in a meaningful way)
- Competency models:
By observing and classifying the behaviors of "successful" employees ("competency-models") and calculating the market value of their output, it's possible to assign a dollar value to the IC they create and use in their work.
- Subsystem performance:
Sometimes it's relatively easy to quantify success or progress in one IC component. For example, Dow Chemical was able to measure an increase in licensing revenues from better control of its patent assets.
- Benchmarking:
Involves identifying companies that are recognized leaders in leveraging their intellectual assets, determining how well they score on relevant criteria, and then comparing your own company's performance against that of the leaders.
- Business worth:
This approach centers on three questions. What would happen if the information we now use disappeared altogether? What would happen if we doubled the amount of key information available? How does the value of this information change after a day, a week, a year? Evaluation focuses on the cost of missing or underutilizing a business opportunity, avoiding or minimizing a threat.
- Business process auditing:
Measures how information enhances value in a given business process, such as accounting, production, marketing, or ordering.

- "Knowledge bank":
Treats capital spending as an expense (instead of an asset) and treats a portion of salaries (normally 100% expense) as an asset, since it creates future cash flows.
- Brand equity valuation:
Methodology that measures the economic impact of a brand (or other intangible asset) on such things as pricing power, distribution reach, ability to launch new products as "line extensions."
- Microlending:
A new type of lending that substitutes intangible "collateral" (peer group support, training, and the personal qualities of entrepreneurs) for tangible assets. Primarily used to spur economic development in poor areas.

After having presented all these methods for measuring knowledge (even they have different underlying concepts), it is interesting to ask which methods are already used in companies today. An answer could be found in the survey of the Competence Center KnowledgeSource [2000a]. There the question was asked to name the measurement methods which are already in use to determine the success of knowledge management activities. Companies could name the listed ones (Intangible Asset Monitor, Deferred labor costs, Human Resource Accounting, Balanced Scorecard, Tobin's Q, Management Value Added and Calculated Intangible Value) or also could list other ones. The following responses resulted:



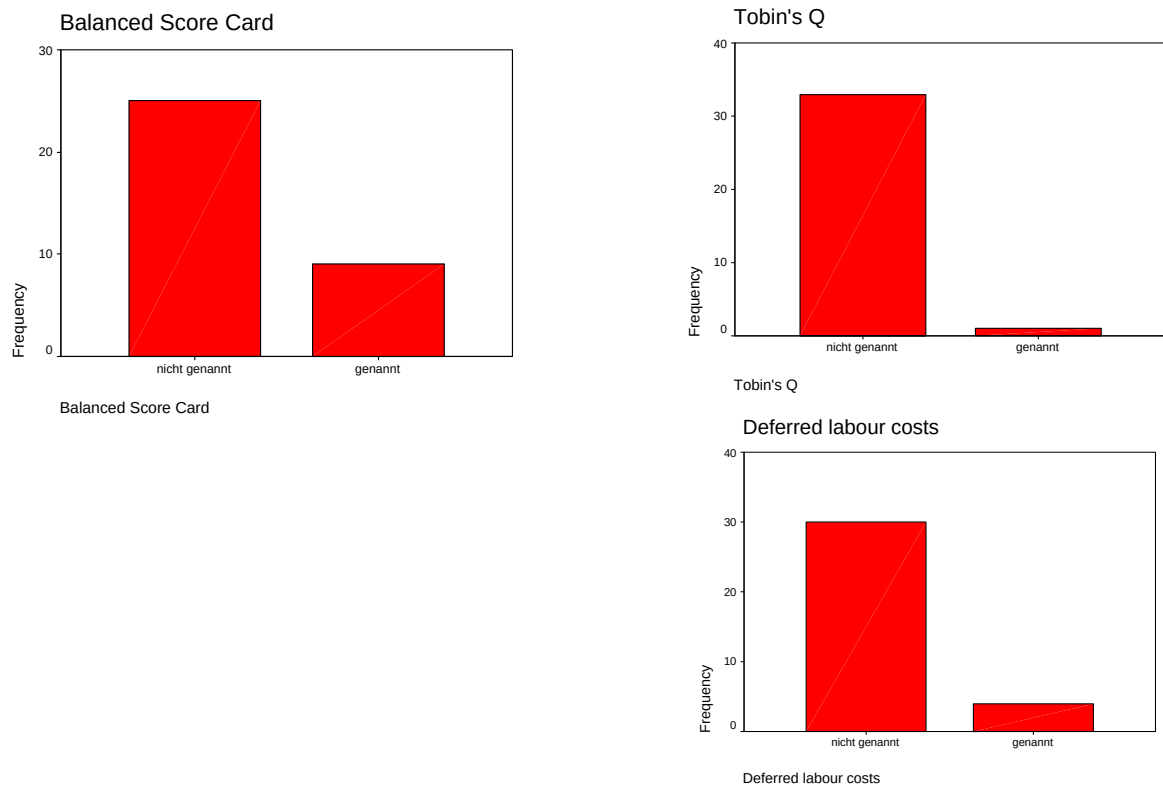


Figure 14: Measuring knowledge management activities in companies: useable methods

3.2 The Balanced Scorecard

3.2.1 What is the *Balanced Scorecard*?

The Balanced Scorecard (BSC) is a quite well-known management and performance measurement tool which provides executives with a comprehensive framework that translates a company's vision and strategy into a coherent set of performance measures, organized into four perspectives: financial, customer, internal business process and learning and growth. Those four categories provide answers for managers to the following basic questions:

- How do customers see us? (customer perspective)
- What must we excel at? (internal perspective)
- Can we continue to improve and create value? (innovation and learning perspective)
- How do we look to shareholders? (financial perspective) [Kaplan/Norton 1992, Letza 1996]

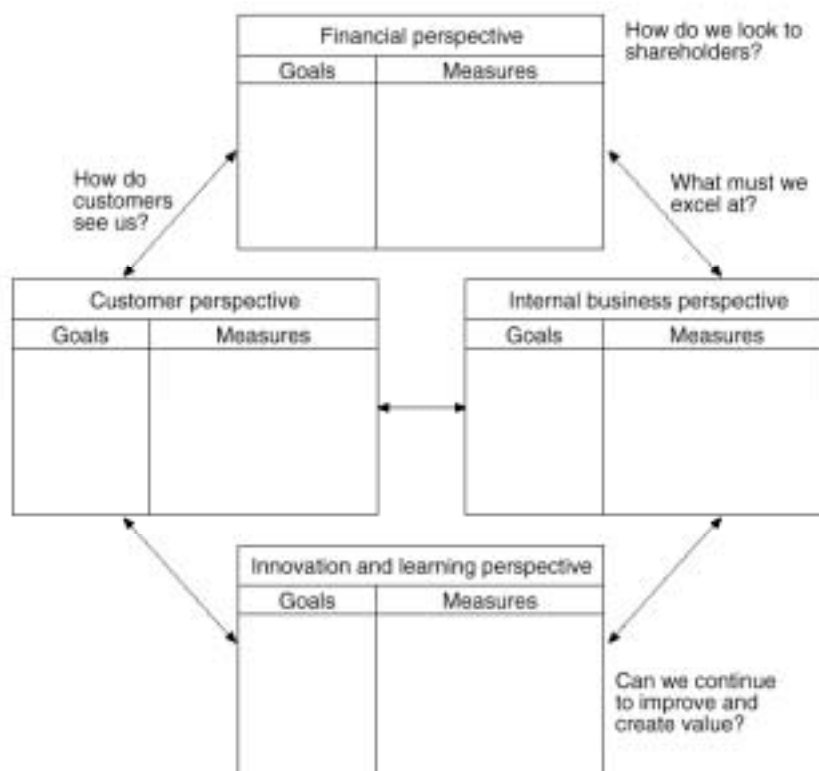


Figure 15: The Balanced Scorecard [Kaplan/Norton 1992]

Like other performance measurement systems too, the BSC follows a multi-dimensional approach. It covers the following dimensions of performance [Merkle 1999]:

Dimension	Characteristics
Results	Past-oriented; "lag indicators" E.g. market share, sales
Processes	Performance drivers; "lead indicators" Internal process perspective E.g. time, quality, price
Resources	Learning and growth perspective Performance drivers; "lead indicators" E.g. Intellectual Capital (IC), Information and Communication Technology (ICT), Incentive systems

Table 1: Dimensions of performance

Kaplan/Norton emphasize, that the BSC retains financial management as a critical summary of managerial and business performance, but in addition the BSC highlights a more general and integrated set of measurements that link current customer, internal process, employee and system performance to long-term financial success. In other words: the BSC expands financial accounting to incorporate the valuation of a company's intangible and intellectual assets, such as high-quality products and services, motivated and skilled employees, responsive and predictable internal processes, and satisfied and loyal customers [Kaplan/Norton 1996b]. The fact, that the BSC integrates different kinds of performance measures, namely quantitative and qualitative measures, lead and lag indicators, etc. into different perspectives as an 'at a glance' overview, is seen by many authors as a main advantage of the BSC [e.g. Ghalayini/Noble 1996].

3.2.2 The Balanced Scorecard as a Strategic Management System

Many people think of performance measurement as a tool to control behaviour and to evaluate past performance. As already indicated, the measures on a BSC should be used in a different way – to articulate the strategy of business, and to help align individual, organizational and cross-departmental initiatives to achieve a common goal. The BSC should be used as a communication, informing, and learning system, not as a system to control people.

The BSC also is more than a tactical or an operational measurement system. Innovative companies are using the scorecard as a strategic management system, to manage their strategy over the long run. They are using the measurement focus of the scorecard to accomplish critical management processes, as the following figure [Kaplan/Norton 1996a] shows:

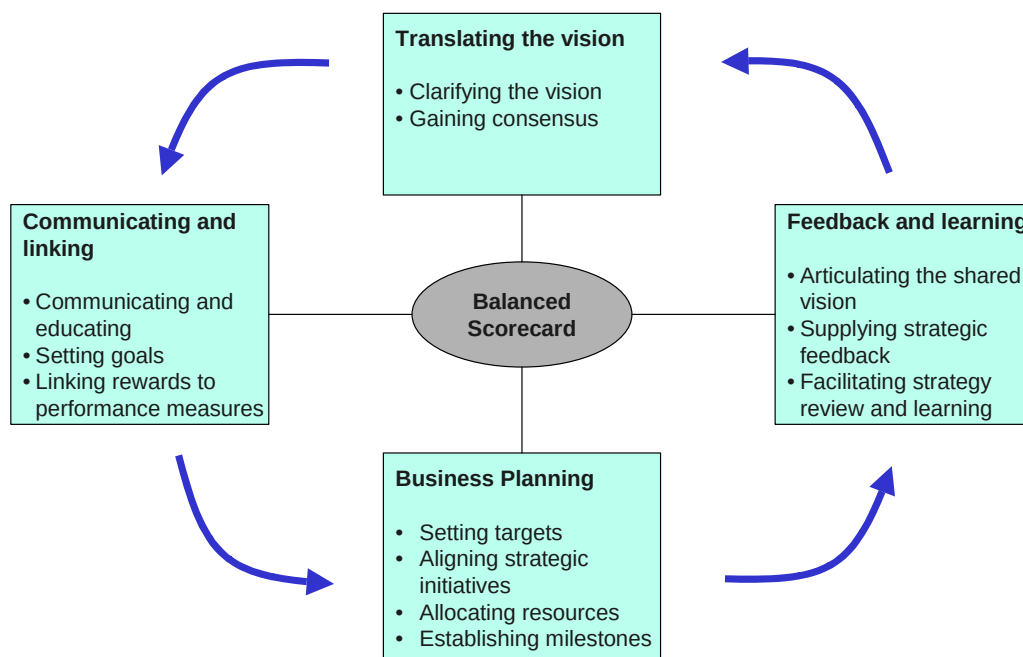


Figure 16: The BSC as a strategic management system

After this short introduction it should have become clear, that the development and implementation of a BSC - wherever in the company - is a process which is strongly related to business strategy.

How the BSC correlates with the knowledge management approach should be explained in the following chapter.

3.2.3 The Balanced Scorecard and Knowledge Management

A basic idea of the BSC is the hypothesis about the chain of cause and effect that leads to strategic success. This cause-and-effect-relationship is fundamental to understanding the metrics that the balanced scorecard prescribes. There are four stages to this chain of cause and effect, outlined in the figure below [Arveson 1999]:

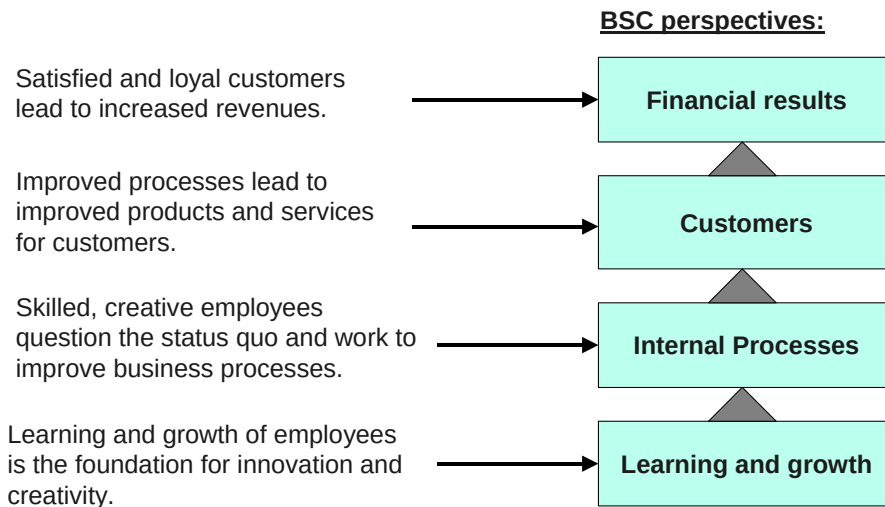


Figure 17: The Balanced Scorecard and Knowledge Management

As the figure suggests and what also many management experts (e.g. P. Drucker, P. Senge) are saying: learning and growth are the key to strategic success and further the foundation for the future. Learning and growth is fostered by knowledge management activities and initiatives. A learning and growing organization is one in which knowledge management activities are deployed and expanding in order to leverage innovation and creativity of all the people in the organization [Arveson 1999].

3.2.4 Case studies

A. American Management Systems¹

"Innovating is not something you can mandate, but you can create sustained opportunities for collaboration and innovation. That's what we do," said Susan S. Hanley, director of knowledge management initiatives for American Management Systems (<http://www.amsinc.com/>). Hanley and AMS have achieved the near impossible: to make "innovation" a formal, daily part of the culture at AMS. They do it by building and maintaining the "shared spaces" in which communities of interest – and those who need expertise – can meet and exchange knowledge.

¹ The AMS case description has been taken from Moore, 1998.

Knowledge Management at AMS

AMS is headquartered in Fairfax, VA, with offices in 55 cities worldwide and is among the 20 largest consulting firms worldwide, expecting 1998 revenues of approximately \$1 billion.

But in the early '90s, growth was causing pain. An expanding practice and the inevitable friction from time zones and dispersed locations pressured AMS to reconsider its "let's-meet-at-the-coffee-machine" style of collaboration and knowledge transfer.

A series of initiatives, begun in 1993, now ensure that each engagement team has access to the best of AMS' knowledge, practices and technology. The most recent of those initiatives, the AMS Knowledge Centers, adds to existing infrastructure the concept of knowledge-based communities of practice.

AMS' knowledge management initiatives include three components:

- technology research and development (AMS Center for Advanced Technologies),
- best-practices discovery and dissemination (AMS Best Practices Program),
- knowledge-based communities of practice (AMS Knowledge Centers).

"The model of having a physical space (the AMS Center for Advanced Technology or AMSCAT) where leading academics, practitioners and researchers could share ideas evolved to be a formal community of practice," explained Dawn Shande, an independent consultant who has studied the AMS initiatives. "AMSCAT sponsors the communities of practice for technical architects, who are responsible for putting the latest technology innovations into practice for their clients.

"The communities of practice provide a formal mechanism for promoting information, learning and innovation in this fast changing field. Through networking sessions, seminars and workshops, the members align topics to real client needs. Their membership and funding processes keep the communities of practice program in line with business goals. They promote collaborative learning, not just document collating."

The AMS Best Practices Program is a formal effort to discover and disseminate the best methodology and management practices from both within and outside the company. At the heart of it is the AMS Knowledge Express, a Lotus Notes-based corporatewide knowledge repository. The Knowledge Express includes a collection of databases ranging from a corporate Yellow Pages to a directory of "Who Knows About ..." to a collection of examples of work products produced on client engagements. The Knowledge Express databases include more than 10 GB of data with more than 3 GB accessed each day by AMSers around the world.

Finally, AMS encourages "birds of a feather" to congregate into communities of practice called the AMS Knowledge Centers. Each is a worldwide virtual community of "Knowledge Centers Associates" connected by interest and expertise in a specific discipline. Each community is led by a team of coordinators whom the company recognizes as leaders in their disciplines.

Knowledge Centers Associates must commit to share their knowledge in a formal way at least once a year, by contributing an original research paper, providing insight into a new technology or project management technique, or with a sample deliverable or report on the lessons learned from a client project. Those contributions are added to the Notes-based knowledge repository and are cataloged and indexed by a team of reference librarians. That knowledgebase is accessible by all AMS employees.

While open sharing and communication may describe the culture at AMS, it is one with its past firmly planted in an oral tradition. AMS' biggest challenge has been in encouraging people to write down their insights so that anyone who needs them can retrieve them electronically, even from different time zones, even if they don't know one another personally.

AMS spends great effort on internal communications, continually describing the benefits and value of documenting knowledge. They encourage participation through rewards and incentives--from invitations to conferences with industry-known speakers, to golf shirts and gourmet cookies, and through public recognition of key contributions in newsletters and flyers. Of course, AMS has an explicit requirement built into most performance evaluations to demonstrate how each employee has made a contribution to the collective intellectual capital.

AMS' measurement approach

AMS believes that tying knowledge management initiatives to a business problem and measuring success against the resolution of that problem is the only way to be successful. There are two components to AMS' measurement approach: the tracking of key metrics and the application of what Susan Hanley calls "serious anecdote management."

As for metrics, AMS views a balanced scorecard from four perspectives:

1. *Financial perspective.* A key component of the AMS Knowledge Centers is a full-service reference library and a knowledge hot line. Last year, the team of four reference librarians successfully solved more than 8,000 knowledge requests. Their speed and efficiency saved AMS more than \$500,000. A recent survey of users of the corporate intranet also indicated that the time saved by AMS consultants

through the use of the knowledge databases represented savings of more than \$5 million a year.

2. *Customer perspective.* AMS clients must receive more than just "more information"; they must receive information of high value to them. More than 300 AMS clients visited the AMS Center for Advanced Technologies and AMS Knowledge Centers in 1998.
3. *Internal business perspective.* Employees shared more than 8,000 deliverables in 1998 and exchanged more than 70,000 E-mail messages each day.
4. *Learning perspective.* Last year, almost every one of the 800 Knowledge Centers Associates participated in at least one workshop or conference.

They also measure value to AMS through "serious anecdote management" of stories from AMSers who have won deals or found what they have needed quickly through the various knowledge management initiatives. When a customer reports that the deal was awarded because of an AMS Knowledge Management initiative, the Knowledge Centers "take credit" for that in their reports to senior management.

B. IC Navigator of Skandia

Skandia was established in 1855 as Skandia Insurance Company Ltd. as first Swedish insurance company [this as well as the following information base on Skandia 2000]. Nowadays, Skandia is an international corporation of insurance and financial services based in Stockholm which is operating in 25 countries around the globe. The products of the assurance group contain international savings as well as life assurances. Skandia has approximately 10000 employees. In 1999, this companies has sales of SEK 134 billion.

Very early, Skandia began to actively think about knowledge management issues. Already in 1980, the then-CEO Björn Wolrath and the head of Skandia AFS, Jan Caredi, realized that knowledge-intensive service company's strength would rely very much on intangible factors like individual talent and the ability to manage the flow of employee competences and skills rather than on tangible assets [von Krogh, Ichijo, Nonaka 2000]. In 1991, in the Assurance and Financial Services business unit (AFS), began to focus on visualizing the value of intellectual capital and the intellectual capital function emerged. Leif Edvinsson became the director of this function and had the task to develop new measurement tools and to visualize and report intellectual capital as a complement of the balance sheet [von Krogh, Ichijo, Nonaka 2000].

According to this task, Skandia began to define their intellectual capital and the value scheme, which shows the building blocks of intellectual capital, resulted:

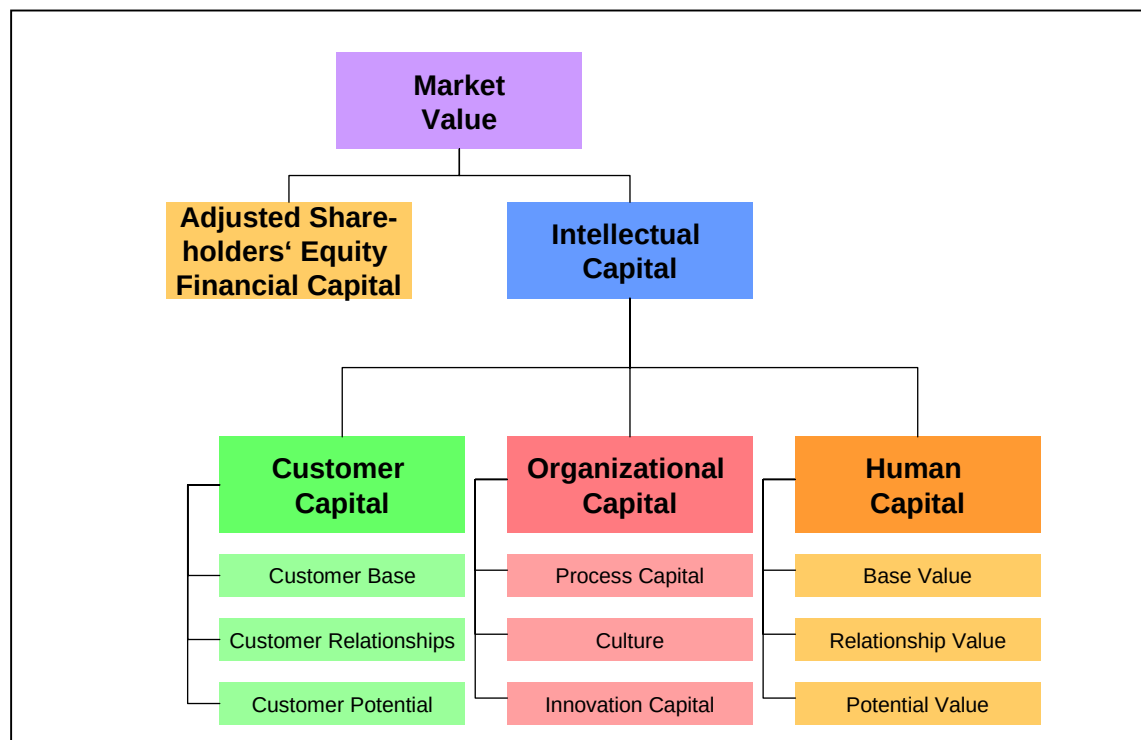


Figure 18: Value Scheme (Skandia 1998)

As defined by Edvinsson, intellectual capital has two basic forms: human capital which includes all individual capabilities as talents, knowledge, and experience of the company's employees and managers as well as structural capital –consisting of customer capital and organizational capital - which consists of everything that remains when the employees go home - infrastructure, including the information technology and physical systems, and innovation capital (intangible rights, trademarks, patents, knowledge recipes and business secrets) [Skandia 1998; von Krogh/Ichijo/Nonaka, 2000].

Based on these definitions, Skandia built the IC-Navigator, their tool for measuring financial as well as intellectual capital which is a future-oriented business planning model [Skandia 2000]. It has five major areas of knowledge sources: the financial focus, the customer focus, the human focus and the process focus as well as the renewal & development focus [Skandia 2000]. Thereby, a balance should be represented between the past (the financial focus), the present (the customer, human and process focuses) and the future (the renewal & development focus).

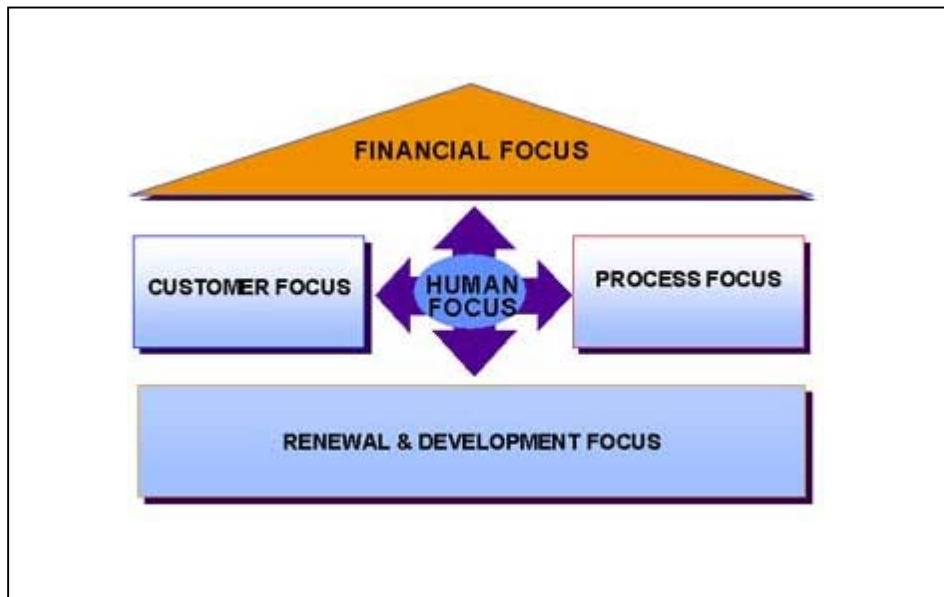


Figure 19: The IC Navigator (Skandia 1998)

According to Skandia, the Navigator should allow the breakdown of Skandia's operational vision and objectives into concrete factors that can be coupled to an individual's own work [Skandia 2000]. To make the different areas usable and measurable, IC indicators are used to translate each focus into useable measures. In the following, examples for such IC indicators will be presented for each area of the IC Navigator [examples are taken from IMD 1996; Edvinsson/Malone 1997; Skandia 1998]:

Examples of IC indicators financial focus (financial results):

- Income/ employee (\$)
- Market value/employee (\$)
- Return on net assets resulting from a new business operation (\$)
- Value added/employee (\$)

Examples of IC indicators customer focus (relationships built up with clients):

- Number of customer accounts (#)
- Days spent visiting customers (#)
- Satisfied customer index (%)
- Surrender ratio

Examples of IC indicators process focus (the efficiency of internal processes):

- Applications filed without error (#)
- Processing time, outpayments (#)
- Contracts/employee (%)
- Administrative expenses/savings (\$)

Examples of IC indicators renewal and development (investments made to develop future human and structural capital):

- Satisfied employee index (#)
- Competence development expense/ employee (\$)
- Training expense/employee (\$)
- New launches (#)

Examples of IC indicators human focus (individual competencies and capabilities important in providing solutions to customer problems):

- Empowerment index (of 1,000) (#)
- Time in training (days/year) (#)
- Motivation index (%)
- Employee turnover
- Satisfied employee index

3.3 Performance and Communities of Practice

3.3.1 *Defining ,Performance' for Communities of Practice*

Defining 'Performance' for Communities of Practice (Community of Practice) is not as easy as it seems to be. It is even more difficult to measure this performance and to assess the value of communities. The following problems of measuring are typical for networks/communities:

- Effects of community activities are often delayed.
- Results generally appear in the work of teams and business units, not in the communities themselves.
- It is difficult to determine whether a community for itself is functioning and therefore on community level performing well.
- It is hard to determine whether an idea surfaced during a community meeting would have emerged anyway in a different setting [Wenger/Snyder 2000].

So what can be done? The following questions can serve as a starting point to define and measure network performance:

- How is 'high performing' in case of a network/community defined?
- What are relevant aspects of 'High performance' - especially with respect to the pursued business goals? And how do high performing KNN relate to high performing organizations?
- What are success factors for the community?
- Which skills are necessary in order to develop 'high performing' communities?
- What level of network/community performance should be reached?
- What are the dimensions of community performance (e.g. the dimension of 'high performing' knowledge work processes)?
- What and for what should be measured?
- What are suitable performance indicators?
- What are appropriate methods for measuring?

Answering these questions might lead to different consequences with respect to measuring the performance of networks/communities. When defining and measuring performance, one always has to keep in mind, that the reason to focus on knowledge and its management is not to have "more, better, faster" knowledge – but to create value.

"We might even find that converting knowledge to value has more to do with 'less' and 'slower' in some way [...]" [Allee 1999]

A first answer and also some examples how community activities in general can be measured are given by Wenger/Snyder [Wenger/Snyder 2000]:

The best way for an executive to assess the value of a community of practice is by listening to members' stories, which can clarify the complex relationships among activities, knowledge, and performance. "The idea we pursued at that meeting helped me persuade the customer to continue to buy our service." "Thanks to advice from the community, I got done in two days what normally takes me two weeks." "I took a risk because I was confident I had the backing of my community- and it paid off."

The solution to the conundrum of valuing communities of practice is to gather anecdotal evidence systematically. You can't just collect certain stories, perhaps the most compelling ones, because isolated events can be unrepresentative. A systematic effort captures the diversity and range of activities that communities are involved in.

At Shell, community coordinators often conduct interviews to collect these stories and then publish them in newsletters and reports. AMS organizes a yearly competition to identify the best stories. An analysis of a sample of stories revealed that the communities had saved the company \$2 million to \$5 million and increased revenue by more than \$ 13 million in one year.

In case of the bilateral project it soon became clear, that an indispensable step towards a performance measurement system for the Knowledge Management community at Daimler-Chrysler is to understand the community and how it works. In particular the goals and tasks of the community and also the pursued business goals are essential to define performance criteria for the community and to develop on this basis a performance measurement system.²

3.3.2 Impact of ,enabling conditions' on performance

What makes the topic of Community of Practice performance and the assessment of the value of a community even more complex is the fact, that a number of enabling conditions inside and outside the community exists, which have an impact on the Community of Practice performance. According to **Frederick Herzberg's Motivator-Hygiene Theory**, such

² Because there exists a relationship between the value added through a Community of Practice and expense/costs caused by the Community of Practice, the issue of expense/costs actually should be considered in some way too. Since this however is more a matter of cost accounting and not directly part of the project definition, we focused on the topic of performance measurement excluding expense/costs.

'enabling conditions' - on the one hand have an effect as 'motivators' and on the other hand as 'hygiene factors'. Anyhow, they are 'barriers' if they are not existing or not fulfilled sufficiently. Such knowledge management barriers might be organizational ones, technical ones but also matters of corporate culture or directly concerns of knowledge work processes. The following figure shows some examples of such barriers:

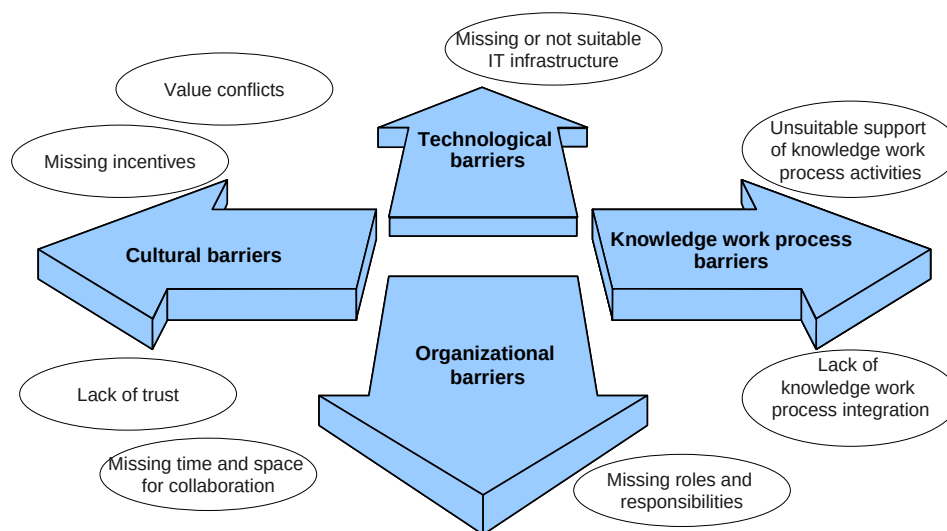


Figure 20: Knowledge Management barriers

If the enabling conditions are missing or fulfilled insufficiently, the performance of the Community of Practice probably will be low. That is the reason why it is important to be aware of these enabling conditions for knowledge management in general but also with regard to the performance of communities. In order to keep the Community of Practice performance high, the measurement of the 'enabling conditions' should also be part of a comprehensive performance measurement system for communities.

Some of the principal thoughts about the internal and external factors which influence community performance can also be found in the literature about high performing teams and team performance management. Even if a Community of Practice is not the same as a team: a lot of ideas and practices can be adopted from the quite well-explored experiences that already have been made within teams. E.g. write Beech/Crane [Beech/Crane 1999] that a social climate of community and an adequate style of leadership is one important enabling factor in the development of high performing teams. Beech/Crane also propose to measure this social climate of community with therefore designed inventories (e.g. a TCI = Team Climate Inventory) in order to support the development of high performing teams [Similar also Ingram 1996].

Furthermore, it is important to pay attention to the **skills** which are necessary to develop high performing communities. In this area the 'high performing team approach' also delivers some good ideas that can be adopted for communities. E.g. it seems to be evident, that 'soft' skills such as giving feedback, communications, problem solving and objective setting are quite helpful to increase community performance. Those 'soft' skills have to be completed with other skills like technical skills, (knowledge) management skills and special skills which are unique for the community.

In order to achieve lasting competitive advantage **meta-capabilities** are in general of importance. Meta-capabilities – capabilities which are related to fields like e.g. learning, participative leadership, collaboration, quality, reengineering and strategic thinking - allow organizations to adapt to change on a continuous basis by contributing the kinds of skills and knowledge that underlie the process of capability-building itself. The creation of meta-capabilities relies on a larger context; a context as it e.g. is represented through Communities of Practice [Liedtka 1999].

Taken our project perspective into account, at this point should be referred to the possibility, to evaluate and gather the skills of the community members systematically through a skill analysis and then to develop the required skills further on this basis. The existence and degree of meta-capabilities can also be evaluated.

In order to include the whole complex of 'enabling conditions' as well as the entire process and methodology of community/network building into a comprehensive measurement system, the CC Knowledge Networks currently is developing a 2-stage approach. The fundamentals of this approach will be presented in the following chapter (see 3.4.2).

3.4 Communities of Practice and Measurement

3.4.1 *Developing a Balanced Scorecard for Communities of Practice*

There exist several reasons why a BSC for Communities of Practice should be developed or at least approved by the community itself. One reason for that is, that the community itself knows best what metrics and measures are suitable for their work. Further, a BSC needs a strong commitment by the involved people, which are in this case primarily the Community of Practice members. Otherwise the BSC can not be implemented successfully, since Community of Practice members cannot identify themselves with the goals of the BSC. Since there exist quite often different interests within a Community of Practice, a consensus about the BSC and its goals, metrics, etc. has to be found. In addition, the BSC of a commu-

nity/network has to be aligned to corporate strategy and also to be coordinated with the BSC's of other organizational levels like business units and the corporate level.

With respect to the topic of a 'high performing' community it is an important success factor, that members of teams, communities, etc. always know, how they are measured and why in order to achieve transparency [Beech/Crane 1999]. Finally this means, that the process of finding a consensus, developing and applying the BSC should be integrated into the process of network/community building as the following figure illustrates (see Merkle 1999, Community of Practice lifecycle: see Wenger 1998, see Seufert/Back/von Krogh 1999b):

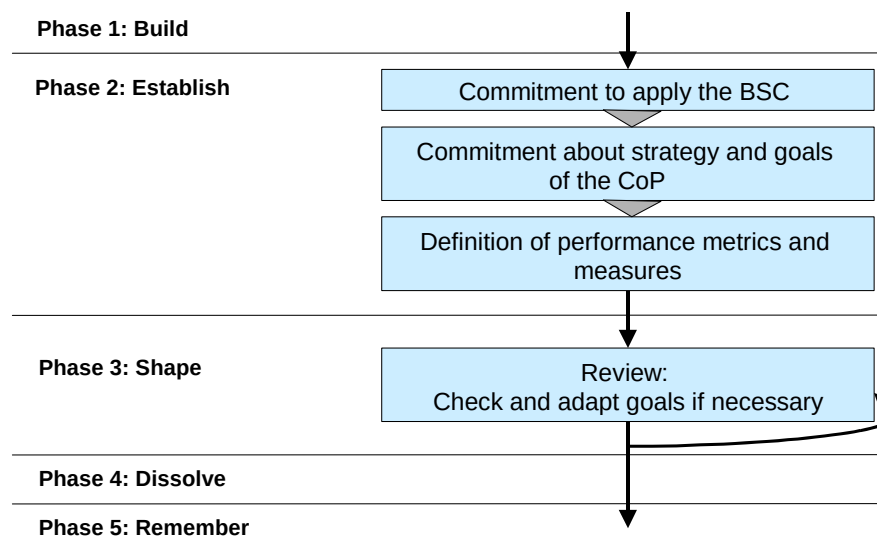


Figure 21: BSC and process of community building

3.4.2 The CC approach: Knowledge Network Scorecard and 'Health Check'

As the previous sections have shown, measuring the performance of networks/communities is a very complex intention, whereby many factors should be considered.

Since the valuation of a network/Community of Practice is a multidimensional problem, the Balanced Scorecard (BSC) principally seems to be a suitable 'management tool' for measuring network/Community of Practice performance [see Merkle 1999]. On the other hand, when one is comparing the different aspects and requirements of 'high performing' communities it becomes clear very soon, that a Balanced Scorecard for itself is not an appropriate tool to cover all the aspects of community performance. One reason for that is that the focus of a BSC is strongly related to corporate strategy. Primarily goals of a BSC are to clarify and translate vision and strategy, to communicate and link strategic objectives and measures, to plan, set targets, and align strategic initiatives, to enhance strategic feedback and learning

and to complement financial figures and business goals with the customer perspective, the internal process perspective and learning and growth perspective.

What should not be kept secret is, that some authors also have criticized the BSC approach. E.g. Brown remarks, that “measuring more things does not get you more quality or guarantee quality.” [Brown 1994] Furthermore, “balanced scorecard approaches are still rooted in industrial age business models.” [Allee 1999] Allee also argues that in a network-based enterprise, the ‘right conditions’, e.g. core values like integrity, honesty, responsibility, etc. have an important role to play for the creation of value and that those conditions are covered insufficiently by existing measurement approaches like the Balanced Scorecard.

However, in order to complement the business strategy-oriented BSC, the CC Knowledge Networks has also developed a “Health Check” for networks/communities. This health check enables the direct derivement of concrete actions to be taken in order to achieve the desired result. The focus of the health check is rather broad. The health check is derived from the methodology and framework which has been developed within the Competence Center. It covers all relevant aspects of how to build and maintain high performing communities.

This health check is aimed to be a complement to the Knowledge Scorecard (which is an adapted BSC for knowledge networks/communities), in order to capture some overriding coordination issues, that can not be measured through a scorecard. Also, the health check aims to incorporate some of the measurements of the scorecard, linking the outcomes with actions that have to be taken in order to achieve the desired result.

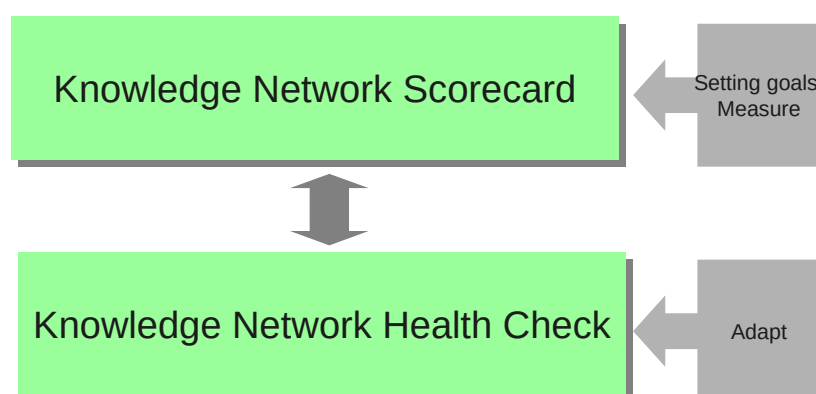


Figure 22: CC approach

The Health-Check shows how the performance of the network can be viewed from different perspectives and how certain outcomes can be linked to concrete actions in order to achieve

improvements. These perspectives are the company perspective, the network perspective and the individual perspective. If one is able to answer all of the questions in one level with “yes” one can go above to the next level. If there are differences, the methodology handbook developed by the Competence Center gives answers what has to be adapted in the community/network.

Where is the gap?

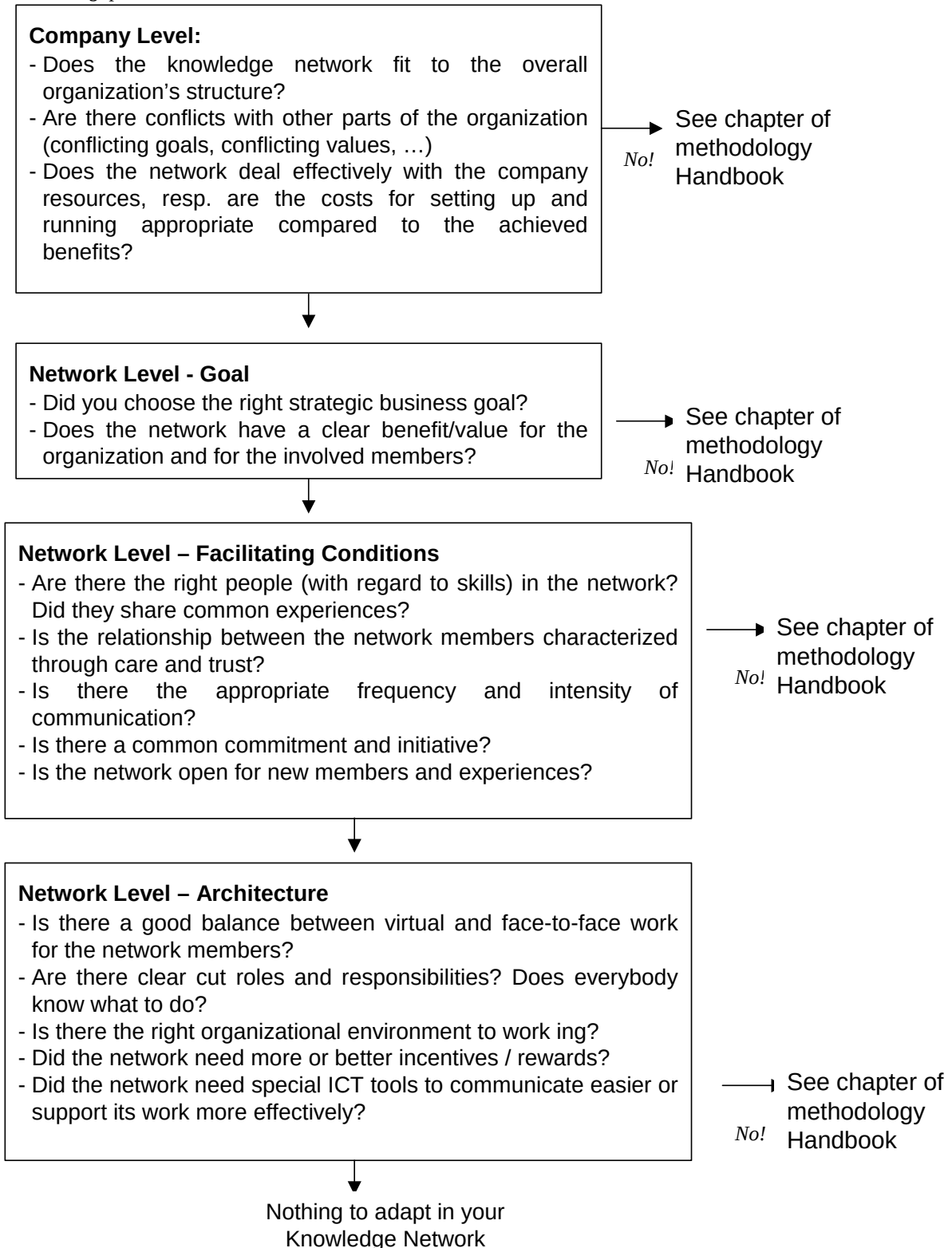


Figure 23: Knowledge Network Health Check

3.5 Performance Measurement and Information and Communication Technology (ICT)

Information and Communication Technologies (ICT) in general provide high potentials for measuring. ICT-based measures to assess the performance of communities/networks can be quantitative measures (e.g. number of documents created, access rate) or qualitative measures (e.g. collaborative ratings of knowledge asset quality).

An online resource can be a central element of a Community of Practice measurement system. A lot of 'online measures' are imaginable and can be implemented online, e.g. to evaluate the different knowledge work processes of building, sharing and applying knowledge.

A few examples should illustrate these potentials:

- E.g. the size of the online resource is an indicator for its power and also for its attractiveness.
- The quality of the online resource also can be measured, e.g. through ratings/rankings. Possible dimensions that can be rated by users are:
 - o Actuality of documents
 - o Originality of documents
 - o Extent of problem solving
 - o Practicability of solutions
 - o Readability of documents, etc.

Such ratings/rankings can be implemented online as a collaborative process. Many web sites and applications on the internet (e.g. auctions, buyer guides, forums) show already how such collaborative ratings/rankings can be used. Rankings and ratings also have an important function as incentives for authors of knowledge management expertise!

- An indicator for the actuality of the online resource is the percentage of new documents to old documents.
- The percentage of successful research requests is a measure for the completeness of the online resource.
- The access rate (per Business Unit) is a simple measure for knowledge sharing and transfer.
- The time users spent to read a document is an indicator for the interestingness and 'value' of a document.
- It is strongly recommended that an online resource additionally should provide explicit feedback mechanisms to allow users to give a feedback on document quality, etc. Giving feedback might be encouraged through rewards and incentives.

- Further possibilities which increase the value of an online resource are provided through different kinds of views and filters on documents. E.g. only documents newer than 30 days might be displayed in a view.

In general, the design of the online resource should consider measurement aspects. Online resource, measurement system and elements of an incentive and reward system for the community can be interlinked in various ways. Good ideas how this can be realized deliver existing online resources on the internet and commercial applications like Amazon.com (www.amazon.com). E.g. Amazon.com demonstrates, how ratings/rankings can be implemented and how reviews help to increase the value of a knowledge base.

Statistics are another possibility how ICT can support measurement of networks/communities. A number of ICT-based statistical measures can be used as indicators for building, exchange and applying of knowledge. Standard web servers like the Notes/Domino server already have integrated such statistical functions. Much more elaborated statistics are delivered by special tools to measure the success of web sites (e.g. WebSuxess, <http://www.exody.net/eng/products/websuxess/websuxess.html>).

With appropriate ICT tools, the BSC itself also can be implemented electronically (e.g. www.gentia.com).

A software company which explicitly supports **strategic knowledge networks** with the Balanced Scorecard approach is the german SAP AG. The following has been taken from a whitepaper written by David Norton, The Balanced Scorecard Collaborative, Inc., and by SEM Product Management, SAP AG [SAP AG 1999]:

“Much of the value from Strategic Enterprise Management comes from the simple networking of the organization with a focus on the strategy. Communication and knowledge sharing typically take place within traditional departmental structures in shared locations. As organizations have become more diverse and scattered, the departmental structure has broken down. New approaches have emerged. Networked organizations don't replace traditional bureaucracies; rather, they provide a way to supplement them by organizing around emerging issues or temporary needs. Networks can be built for any purpose. The Balanced Scorecard narrows the options by focusing the organization on the critical few issues emanating from the strategy. This is where knowledge sharing and networking will have the greatest payoff.

Successful strategic knowledge networks are designed around several principles:

- **Shared Mission.** The Balanced Scorecard defines the shared strategic agenda. Each piece of this agenda is a potential network. In Figure 24 (Source: The Balanced Scorecard Collaborative, Inc.), a Strategic Knowledge Network was established around the theme “Safe

and Reliable.” The mission for the network was “Reduce manufacturing cost through increased reliability and safety.”

- **Membership.** Members of a network are selected based on what they know and what they can contribute to others. When individuals build their personal scorecards, they define which objectives they are responsible for and, hence, which networks they could benefit from. The figure shows how more focused networks emerge; the “maintenance” activity was further divided into “refinery turnarounds,” “instrumentation,” and “machinery.”
- **Communication Infrastructure.** The infrastructure must be built to facilitate knowledge transfer. Both organization and technology infrastructure are needed. Protocols are required to determine what information will be gathered and how it will be edited and disseminated.
- **Share Best Practice.** Many kinds of knowledge can be shared on the network. The “low-hanging fruit” comes from sharing experiences on best-practice work approaches and insights. As the network matures, benchmark databases, procedure manuals, and joint projects help to disseminate additional strategic know-how.
- **Link to Scorecard.** The value of a network is amplified if its activities are linked to the measures on the scorecard and results are provided. Some networks will develop their own scorecard to translate their mission into action.

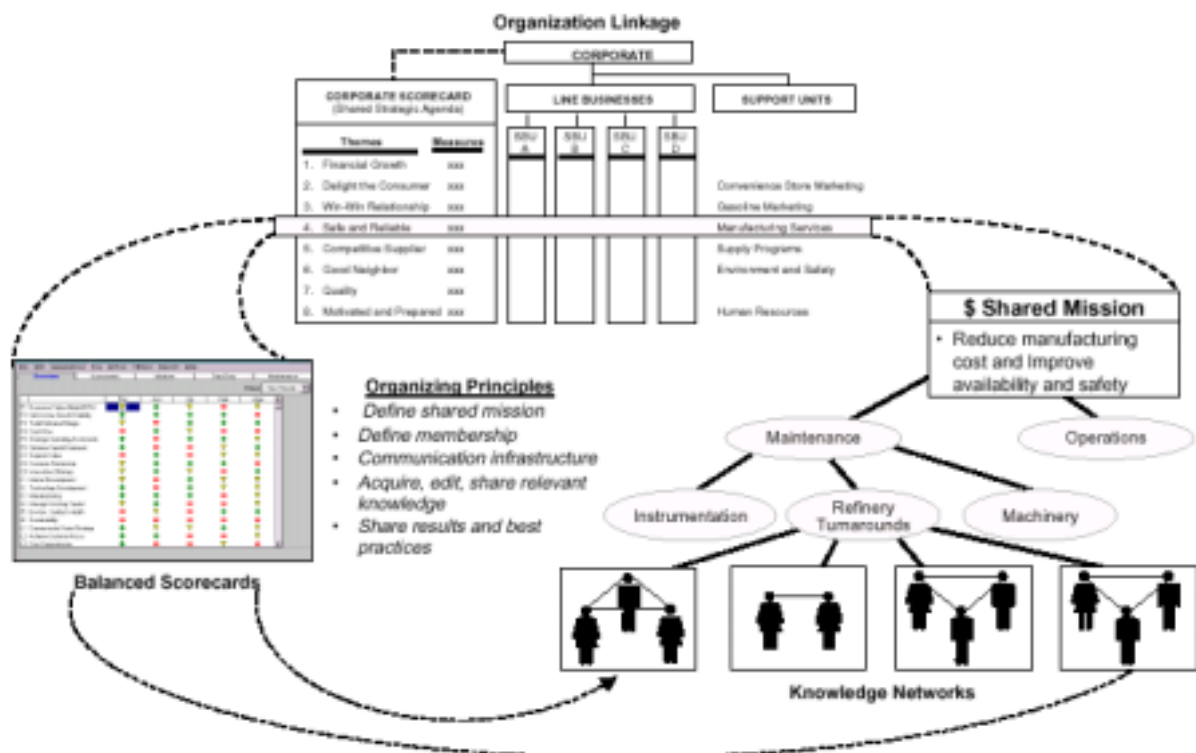


Figure 24: Strategic Knowledge Networks

SAP SEM facilitates strategic knowledge networks with the following functionality:

- Network database with information such as member names and job descriptions or roles, member e-mail addresses, etc.
- Employees can assign themselves to one of these networks (e.g., when defining their personal scorecards) once they know which strategic activities they must focus on.
- E-mail and workflow functionality supporting the communication infrastructure.”

An advanced example of how the technology of data mining can be used to assess the exchange of knowledge give [Adams/Freeman 2000]:

“For our usage patterns we used a data-mining tool normally used to mine e-commerce Web-sites. This coupled with the advanced search capabilities of the [...] group memory yielded us the majority, but not all, of the necessary data for the measure. Usage data gave us very raw indicators of information exchange. Sifting through this data for patterns provided us indications of “knowledge exchanges”. Its value alone is not enough to determine the success of our knowledge initiative. However, it definitely can determine whether or not information is becoming more accessible and if it is actually being looked at and applied within a different context than it’s point of origin. In mining the usage data we look for the [...] measures which mirror the four sequential activities of knowledge work.” (the four activities here are access, generating, embedding and transferring knowledge)

Further, they suggest the following indicators in order to measure ‘knowledge transactions’ [Adams/Freeman 2000]:

- Requests (IP addresses of users)
- Revisions (generation of new information should be measured through modified items in the knowledgebase)
- Publications (embedding of information in the knowledgebase)
- References (transfer of information, e.g. measured by use of the search engine)

Taken all aspects of ICT-based measurement together, a measurement system for a network/community ideally might be integrated into an overall architecture as the following figure shows:

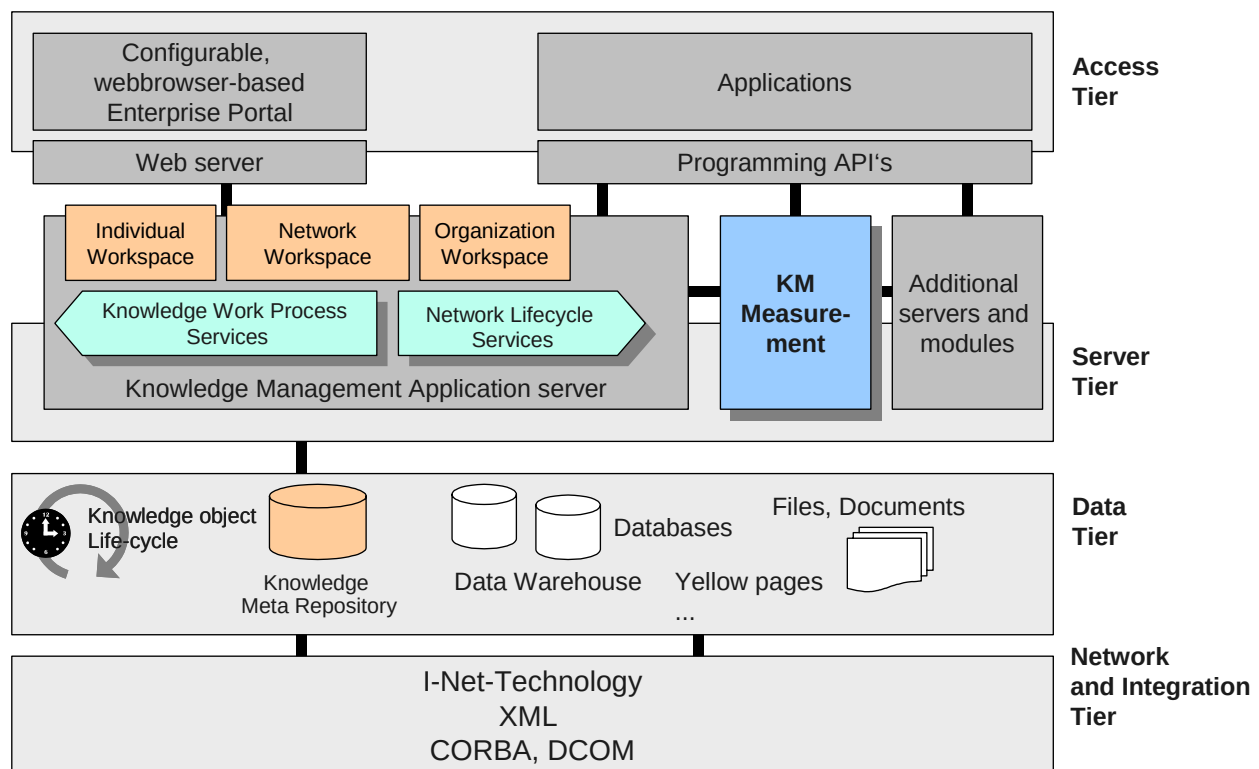


Figure 25: Knowledge Management Measurement as a component of an ICT architecture

Adam/Freeman also say that for successful Knowledge Management implementation, one must look at the human side as well as the data side. Therefore, "a means for measuring KM initiatives is to look for indicators of CoP cultivation and specifically for initiatives involving group memory technologies and principle patterns which reflect the completed cycle of the knowledge work process." [Adams/Freeman 2000]:

In any case ICT-based measures have to be applied carefully and in agreement with community/network members, since ICT also might be used in a negative sense for control purposes. Privacy of the community and its members should always be respected.

4 RESULTS: THE KNOWLEDGE MANAGEMENT COMMUNITY OF PRACTICE ON CORPORATE LEVEL AT DAIMLERCHRYSLER

4.1 Description of the Community

4.1.1 Brief overview

The Knowledge Community of Practice on Corporate Level at Daimler Chrysler was formally founded in October 1999. Its work stands in a close relationship to the DaimlerChrysler Corporate University which is acting as an integrator to support and coordinate knowledge management activities at DaimlerChrysler.

The Knowledge Management Community of Practice works – with its vision and tasks in the field of knowledge management (see for that 4.1.2 and 4.1.3) - on a corporate level. At the moment, there are about 30 members in this community. Thereby, each of the different business units and central departments are represented by one to two members who work in that community (Source: DaimlerChrysler 2000f):

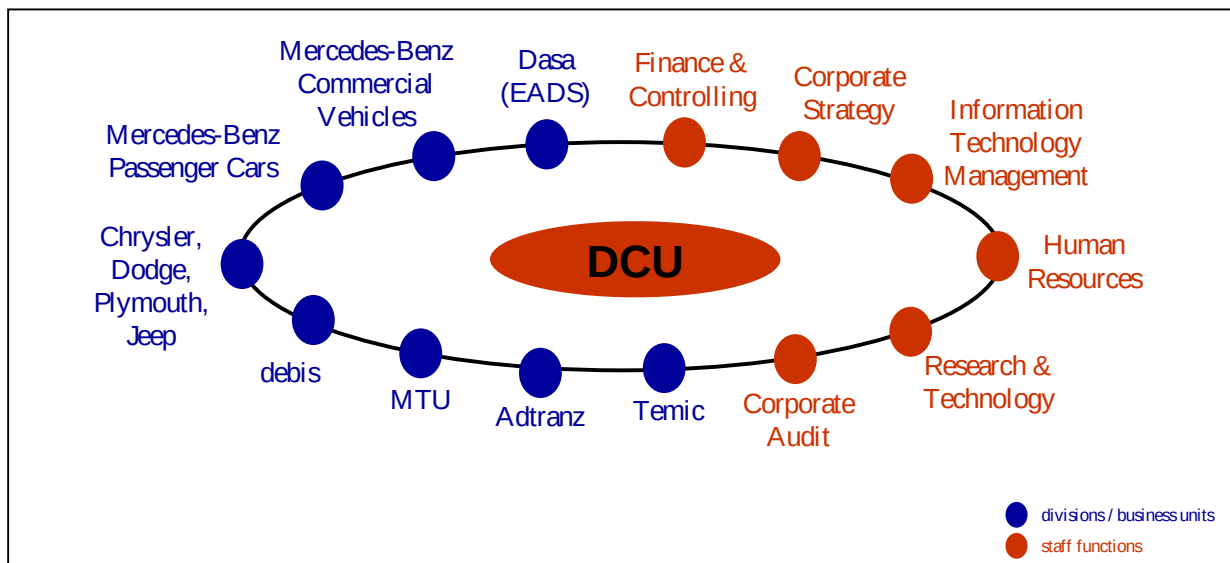


Figure 26: Knowledge Management Community of Practice on Corporate Level

With this structure, corresponding Communities of Practice on business unit level can and should transfer the topics of Knowledge Management into the different company areas and relevant projects. Regarding sharing knowledge in the Community of Practice on Corporate Level, there exist several communication possibilities, especially that community members will meet face-to-face in meetings about certain relevant topics from time to time. It is planned that the Community will come together four times a year. Till now, three meetings were hold.

4.1.2 Mission/Vision

According to DaimlerChrysler [DaimlerChrysler 2000f], the mission/vision of the Knowledge Management Community of Practice on Corporate Level is:

The Knowledge Management Community of Practice helps DaimlerChrysler to build, share and apply the best knowledge available to achieve superior business results.

Hand in hand with this vision, DaimlerChrysler [2000f] also defined other important aspects regarding the vision. These are:

- Active knowledge communities work in and across businesses to share knowledge and to steward strategic capabilities
- Distinctive KM capabilities are clearly defined and integrated at the BU and corporate levels
- Leaders at BU and corporate levels consistently support well crafted knowledge strategies
- All organizational systems support knowledge-creating activities and behaviors
- Competent and credible KM groups support KM processes and communities at BU and corporate levels
- Knowledge measures are pervasive and rigorous enough to drive investment and results

4.1.3 Tasks and goals

The Community on Corporate Level about Knowledge Management concretized explicitly or implicitly several goals/sub-goals to achieve its mission/vision. Since the vision takes into account several knowledge processes as knowledge creation, knowledge sharing as well as knowledge applying, there are many different tasks and goals the community has and wants to fulfill. In the following, the different goals and tasks are named and therefore a variety of tasks are evident. According to DaimlerChrysler [DaimlerChrysler 1999a, DaimlerChrysler 2000c, DaimlerChrysler 2000d, DaimlerChrysler 2000e, DaimlerChrysler 2000f], the different goals and tasks are:

- Integrate KM activities and initiatives throughout the company on corporate level
- Provide a forum; support and coordinate the different KM activities and initiatives.
- Bring leaders of KM initiatives together to learn together, to coordinate efforts and to develop action plans.
- Hold meetings, conferences and workshops.

- Find and consolidate KM expertise from internal and external sources.
- Build an online resource that includes case studies, tools, methods, best practices, and a directory of experts.
- Develop a Knowledge Management Framework.
- Define guidelines for Knowledge Management.
- Develop measures/a measurement methodology for success/benefit of Knowledge Management activities.
- Discuss and develop IT standards.
- Internal and external Benchmarking and Monitoring in the field of Knowledge Management.
- Start-Up-Support for Communities of Practice in the company.
- ‚Help desk‘ to answer questions about Knowledge Management in order to support colleagues.
- Implement and embed Knowledge Management in the company in order to support strategic business goals.
- Develop methods and support strategies for the development of new core competencies.
- Provide appropriate Knowledge Management methods and techniques.
- Create a common ground for knowledge management activities (e.g. common internet strategy).
- Create synergies through knowledge systems and knowledge exchange.
- Synergies between business units should be fully leveraged.
- Develop a KM strategy.
- Develop a standardized concept for Communities of Practice and Books of Knowledge (BoKs).
- Provide Coaches to help Communities of Practice renew their KM efforts.
- Promote KM activities internally and externally.
- Organize and facilitate KM Communities of Practice meetings.

4.1.4 Supported Business goals

Business goals are relevant for the Community on Corporate Level since this community actively wants to contribute to these goals. This is already established in the wording of the mission/vision statement: "... help ... to build, share and apply the best knowledge available to achieve superior business results". Therefore, their tasks and results of knowledge management activities should strongly support questions and problem-solving in processes and in projects all over DaimlerChrysler.

After reviewing the business goals which are supported, it could be said that the following ones are supported by the vision and by planned/running activities of the Community on Corporate Level about Knowledge Management [see DaimlerChrysler 2000b, DaimlerChrysler 2000c]:

- “Reduce error rate”
- “Speed up time to market”
- “Increase innovation”
- „Improve Efficiency“ - Standardization/Process optimization
- „Managing risk“

These business goals of this Community correspond to the business goals of the framework of the Competence Center Knowledge Networks which are “Managing risk”, “Improve efficiency”, and “Innovation” (see chapter 1.2.2).

4.2 Developing a Balanced Scorecard for the Knowledge Management Community of Practice

4.2.1 Levels of Measurement

A starting point for developing the BSC for the Knowledge Management Community of Practice at Daimler Chrysler was to analyze the relationships of 'value creation' between the involved organizational levels and units. This step is important since in order to establish measures one has to clarify where the results of the community work appear. In particular relevant for the Knowledge Management Community of Practice are the 'value-creating' relationship between the Community of Practice and the business units, the relationship between the Community of Practice and the corporate level and also the (reciprocal) relationship between the Community of Practice and the individual Community of Practice members and other individuals.

Here are a few examples how this is to be understood: if a Knowledge Management 'best practice' developed by the Knowledge Management Community of Practice is going to be implemented successfully in a business unit, then the Knowledge Management Community of Practice has created some 'value' for the business unit. If an individual creates a useful document for the Knowledge Management Community of Practice, the individual has created 'value' for the Knowledge Management Community of Practice (and of course also for the whole company). Last not least, the Knowledge Management Community of Practice itself with its Knowledge Management activities delivers a contribution ('creates value') to corporate strategy and the company as a whole.

For the relationship between the Knowledge Management Community of Practice and the different business units it is of great importance to keep in mind that the Knowledge Management Community of Practice works on corporate level. Its members are coming from the different business units at DaimlerChrysler in order to coordinate and integrate Knowledge Management activities on corporate level. In order to create maximized value for DaimlerChrysler, the work of the Knowledge Management Community of Practice has to be aligned to goals of the corporate strategy. Coordination with goals of the business units also is required. From this context can be derived, that several levels where to measure are relevant for the Community of Practice on Corporate Level about Knowledge Management as figure 27 illustrates:

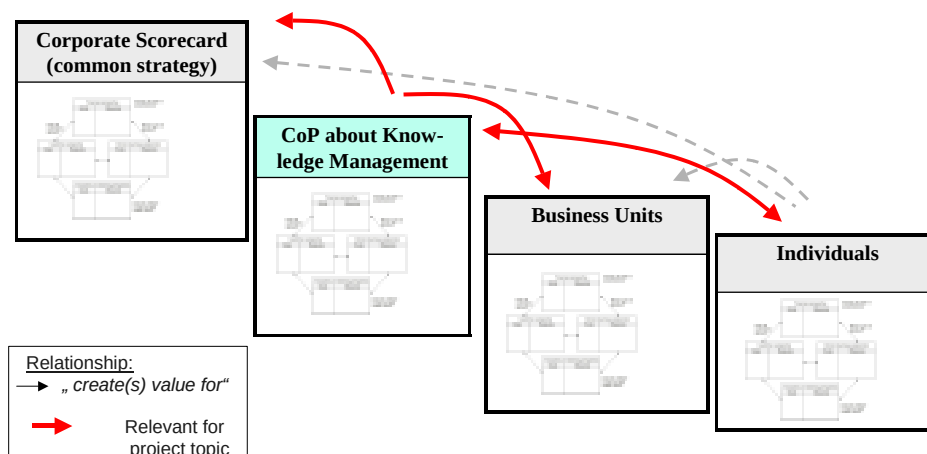


Figure 27: Levels of measurement

4.2.2 Proceeding

To develop a BSC for the Knowledge Management Community of Practice at DaimlerChrysler our proceeding was subdivided into several steps. This proceeding follows a quite standardized approach [see e.g. Letza 1996; IMD 1996; Skandia 1996].

A first step was, to understand how the Knowledge Management Community of Practice works and which are the relevant tasks/goals of the Knowledge Management Community of Practice. For that, we developed a questionnaire and then conducted several interviews with members of the Knowledge Management Community of Practice at DaimlerChrysler. Further, we used some internal documents from DaimlerChrysler about the Knowledge Management Community of Practice in order to get a better understanding of the function and structure as well as goals and tasks of the Knowledge Management Community of Practice.

Then, after the results of the interviews had been consolidated, we denominated success factors of the Knowledge Management Community of Practice. For that purpose we formulated 'leading questions' for each goal/task of the Knowledge Management Community of Practice in order to express what is of importance to fulfill these goals/tasks successfully.

In a next step we assigned each task/goal to a perspective of the BSC. Further, for each task/goal we defined a number of performance indicators in order to measure the degree of goal achievement with respect to the success factors. The performance indicators taken as especially important by us were marked specifically. We also denominated methods how measurement in case of each goal/task can be realized.

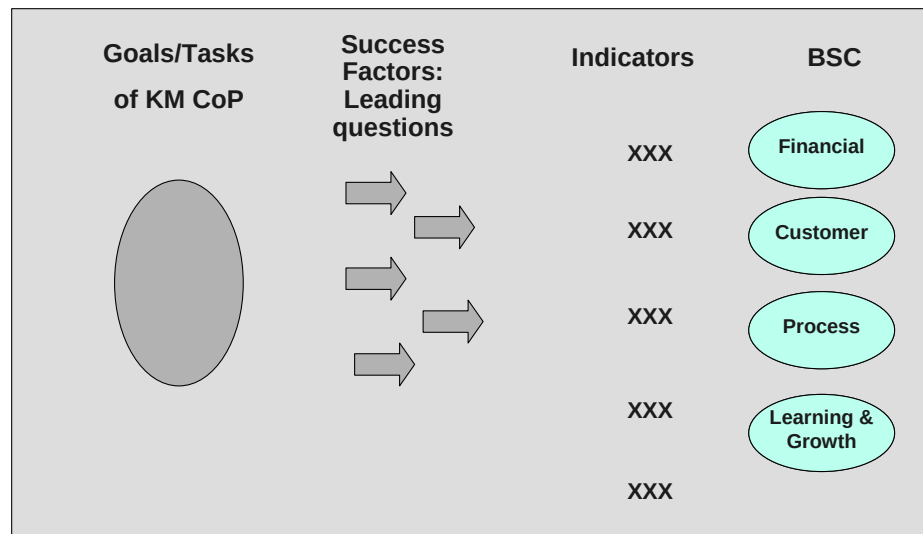


Figure 28: Proceeding of developing the BSC

Since most goals/tasks have been assigned to the perspectives 'Learning and growth' and 'Internal processes' of the BSC, we then completed the performance indicators with additional indicators of the perspectives 'Customers' and 'Financials'. These performance indicators are - in contrast to the indicators of the two other perspectives - often 'lag' indicators. The lag indicators mostly have been taken from relevant literature but while doing this we also have – as far as possible - considered the business goals of DaimlerChrysler.

The completion of the collection of performance indicators primarily has been done in order to achieve a really 'balanced' scorecard which means to close the gap between on the one hand goals of the perspectives 'Learning and growth' and 'Internal processes' and on the other hand the customers and financial perspective. According to the concept of the BSC, the BSC perspectives should not be seen isolated from each other. Rather, it is very important to combine the chain of cause-and-effect relationships of all measures with financial goals [Kaplan/Norton 1997].

As an additional step we also have defined some performance indicators which are closely related to the work of the Knowledge Management Community of Practice and its members. These indicators can be used to measure "how good the Knowledge Management Community of Practice is functioning."

Last not least it was necessary to consolidate the great number of performance indicators in order to built finally the BSC for the DaimlerChrysler Knowledge Management Community of Practice.

4.3 Knowledge Management Community of Practice: Performance Indicators

4.3.1 Performance Indicators for the goals/tasks of the Knowledge Management Community of Practice

In this section of the project report the proposed performance indicators for each task/goal of the DaimlerChrysler Knowledge Management Community of Practice are listed. For each task/goal of the Knowledge Management Community of Practice we have denominated the relevant BSC perspective. Further we have defined success factors/'leading questions', suitable performance indicators and methods how to measure them.

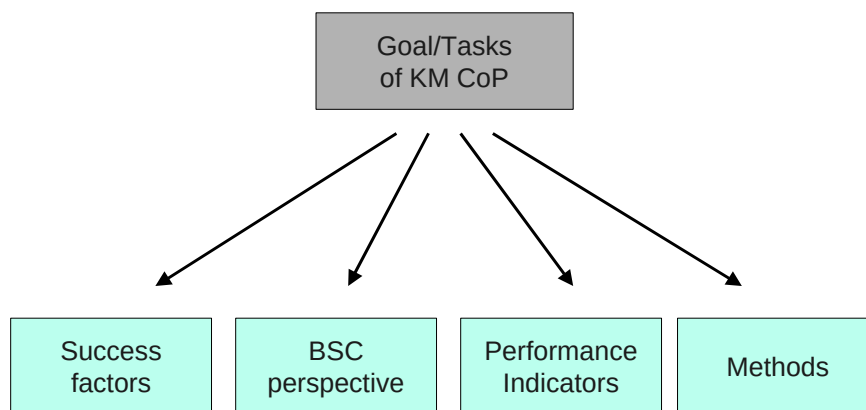


Figure 29: Performance indicators overview

For each task/goal and the dedicated performance indicators DaimlerChrysler has to determine which indicators should actually be taken and who should be responsible for executing the required measuring tasks and activities.

- A. Goal/Task: The Knowledge Management Community of Practice helps DaimlerChrysler to build, share and apply the best knowledge available to achieve superior business results**

Balanced Scorecard perspective: Learning and Growth/Internal Processes

Success factors/Leading questions:

- What are the elements to measure building knowledge/creating knowledge?
- What are the elements to measure sharing knowledge?
- What are the elements to measure applying knowledge?

- What are performance elements that indicate the performance?
- What is the contribution to business goals?

Indicators:³

- **# (= number) of ideas and new products**
- % of new ideas generated to new ideas implemented
- **# of knowledge transfer projects (across BU boundaries)**
- **Increase of the speed of problem solving**
- **Reduction of time to market of solutions**
- **Decrease of the error rate over time**
- Access rate on knowledge base (per BU)
- **Usage of knowledge resources**
- **% of actively participating users (per BU)**
- **# of realized KM projects (per BU)**
- # of success stories of the Community of Practice circulating in DaimlerChrysler
- **Relevance of KM in DaimlerChrysler**
- **Level of acceptance of the Community of Practice**

Methods: Statistics, ICT-based measures, Questionnaire, (Collaborative) Ratings, Story Telling

B. Goal/Task: Integrate KM activities and initiatives throughout the company on corporate level

Balanced Scorecard perspective: Internal Processes

Success factors/Leading questions:

- What does integration mean?
- Which KM activities should be integrated?
- Which business units (BU) participate?
- What should be the degree of integration?
- Does an agreement to integration and common standards exist?

³ The bold formatted indicators we have estimated as indicators of higher priority.

- Does more effective communication result?
- What is the status of integration projects?

Indicators:

- **% of KM activities integrated by the Community of Practice to non-integrated activities**
- # of observed redundant activities
- **% of realized to planned integration activities**
- # of integrated KM activities(per BU)
- **# of KM activities across business units**
- **Amount of contacts and intensity on common working projects between the different KM activities and initiatives**
- **Intensity of cooperation between Community of Practice and the different KM areas**
- Degree of commitment to common rules and standards

Methods: Statistics, Questionnaire, Reporting

C. Goal/Task: *Create a common ground for knowledge management activities (e.g. common internet strategy)*

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Does a common understanding about KM exist?
- Do common KM strategies exist?
- Do common guidelines exist?
- How is KM accepted in the company?

Indicators:

- Degree of acceptance of KM (also per BU)
- Degree of awareness of KM

- Amount of common rules and standards
- **Degree of commitment to common rules and standards**
- **% of realized activities for building a common ground to planned ones**

Methods: Questionnaire, Acceptance analysis, Awareness analysis

D. Goal/Task: *Create synergies through knowledge systems and knowledge exchange. Synergies between business units should be fully leveraged*

Balanced Scorecard perspective: Internal Processes

Success factors/Leading questions:

- Is there an openness for exchanging knowledge to and from others?
- Will knowledge systems be accepted?
- Where can synergies be realized?
- How can synergies be realized?

Indicators:

- # of knowledge systems created
- **Acceptance of created knowledge systems**
- # of knowledge exchange channels created
- # of knowledge exchange channels supported
- **Increase of knowledge exchange activities across business units**
- **# of shared KM assets (methods, best practices, systems, etc.)**
- # of BU's sharing a certain KM asset
- **Use of knowledge systems (also per BU)**

Methods: Statistics, electronically implemented measures, Questionnaire, Storytelling

E. Goal/Task: *Provide a forum; support and coordinate the different KM activities and initiatives*

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Which support services for KM activities should be provided?
- How good is the quality of support services for KM activities?
- What are the right forms of a forum?

Indicators:

- **# of support activities (also per BU)**
- % of activities coordinated to not-coordinated KM activities (also per BU)
- # of participants at forum events (also per BU)
- **Degree of satisfaction with Community of Practice support**

Methods: Statistics, Questionnaire, Satisfaction analysis, Evaluation of forum events, Story analysis

F. Goal/Task: *Bring leaders of KM initiatives together to learn together, to coordinate efforts and to develop action plans*

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- What possibilities exist to bring the leaders together?
- Are leaders willing to get together?
- What learning fields do exist for leaders of KM initiatives?
- Which KM activities should be coordinated?
- What possibilities do exist to influence the coordination process?
- Which action plans are ideal and which are realistic?
- To what degree action plans can be implemented?

- Is there an orientation towards strategic business goals?

Indicators:

- # of initiated meetings
- **# of common activities to learn together**
- # of participants at learning events (also per BU)
- **% of invited people who participated in meetings to those who did not participate**
- **# of common KM activities across BU's**
- **# of action plans resulted from these meetings/contacts**
- **% of action plans running or finished to not initiated ones**

Methods: Evaluation of learning events, Statistics

G. Goal/Task: Hold meetings, conferences and workshops

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Is there enough time to participate at these communication events?
- Is the relevance of such communication events understood and accepted?
- Do these communication events have results and are practically relevant?
- How many events are useful?
- How is the quality of events?
- Which topics should be covered?
- Does there an orientation at strategically important goals and topics exist?

Indicators:

- **# of meetings, conferences, workshops**
- **% of realized meetings, conferences and workshops to planned ones**
- **% of invited people who participated in meetings to those who did not participate**

- Acceptance of these meetings, conferences and workshops
- # of event topics
- **Quality of meetings, conferences, workshops**
- **# of decisions resulting from meetings and workshops**
- **% of decisions resulting from meetings and workshops to realized decisions (per BU)**

Methods: Evaluation of events, Questionnaire, Statistical analysis

H. Goal/Task: Find and consolidate KM expertise from internal and external sources

Balanced Scorecard perspective: Internal Processes

Success factors/Leading questions:

- What are the relevant sources?
- Is the quality and reliability of KM sources guaranteed?
- Is the access to the sources possible?
- Which topics are covered by the sources?
- What is the strategic relevance of the topics?
- What is the practical relevance of the topics?
- How can speed and quality of a consolidation process be achieved?

Indicators:

- # of new channels for finding knowledge
- **# of KM expertise areas**
- **Amount of newly detected knowledge to knowledge already known**
- **# of internal sources (per KM expertise area)**
- # of internal KM-relevant contacts
- **# of external sources (per KM expertise area)**
- # of external KM-relevant contacts
- Internal-external sources ratio (per KM expertise area)
- % of relevant sources to consolidated sources
- **Quality of internal and external sources**

- **# of days to consolidate a KM source**

Methods: Statistics, Benchmarking, Questionnaire, ICT-based measures, User feedback

I. Goal/Task: Build an online resource that includes case studies, tools, methods, best practices, and a directory of experts

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- How good is the usage of online resource?
- What is the content of online resource and what quality/actuality does it have?
- What degree of completeness is necessary?
- How to build speed for and how to guaranty the quality of the content management process?
- Does an orientation towards knowledge demand exist?
- Is the content applicable?
- What is the role of experts?
- What about the expenses to maintain such an online resource?

Indicators:

- **# of cases, tools, best practices, ...**
- **Growth rate of case studies, tools etc. in the online resource**
- Change rate of case studies, tools etc.
- % of new documents to old documents
- % of new documents per month
- **Quality of online resource**
- **Access rate over time (also per BU)**
- **Average visit time on the online resource**
- **# of times the online resource has been consulted**
- Time users spent to read a document
- % of successful search requests to unsuccessful requests
- # of requests per KM expertise area

- % of users updating weekly
- **% of actively participating users (e.g. with feedback) (also per BU)**
- **Level of diversity of users**
- # of individual computer links to the database

Methods: Statistics, Questionnaire, ICT-based measures, User feedback

J. Goal/Task: Develop a Knowledge Management Framework

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Who has to work on the KM framework?
- Will there be an acceptance of such a framework?
- Is there an agreement of Community or Practice members/stakeholders?
- How about the completeness of KM framework?
- How about the applicability of KM framework?
- Is there an orientation at business goals?

Indicators:

- **Existence of key components of the knowledge management framework**
- **Quality of Knowledge Management Framework**
- % of defined KM (Framework) activities to already implemented KM (Framework) activities
- **% of KM activities covered by KM model to KM activities in DC**
- Agreement of Community or Practice members/stakeholders on the KM Framework
- **Acceptance of the framework by the different BU's and within the knowledge management groups**
- Communication efforts in making the framework explicit

Methods: Benchmarking, Questionnaire, Stakeholder analysis, Communication analysis

K. Goal/Task: Define guidelines for Knowledge Management

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Is there an agreement of Community or Practice and DC members with guidelines?
- Is there an acceptance in DC to use these guidelines?
- Which KM areas are covered by guidelines?
- Are the guidelines applicable?
- Who should use guidelines?
- Are the guidelines flexible?

Indicators:

- **# of defined guidelines**
- % of KM areas covered with guidelines to not covered ones
- **Quality of guidelines**
- Degree of understandability of the guidelines
- **% of defined guidelines to applied guidelines (also per BU)**
- **Acceptance of the guidelines by the different business areas and within the BU's**
- Communication efforts in making the guidelines explicit

Methods: Statistics, Questionnaire, Story Telling

L. Goal/Task: Develop measures/a measurement methodology for success/benefit of Knowledge Management activities

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Which areas are covered by the measures?
- Do the measures have an orientation towards goals of Community of Practice and business goals?
- Is there a coupling of measures with incentives?
- Are the measures in balance?
- Does the measurement system consider cause-and-effect relationships?
- Are the measures applicable?
- Who should use measures?
- Is there an agreement of Community of Practice and DC members with the measurement method?
- Is there an acceptance in DC to use defined measures?

Indicators:

- **# of (key) measures for KM activities**
- # of measures per KM activity
- **% of quantitative to qualitative measures**
- % of lead indicators to lag indicators
- Degree of understandability of the measures
- **% of defined measures to applied measures (also per BU)**
- **Acceptance of the measures by the different business areas and within the knowledge management groups**
- Communication efforts in making the measures explicit

Methods: Benchmarking, Statistics, Questionnaire, Correlation analysis Analysis of Cause-and-Effect Relationships

M. Goal/Task: Discuss and develop IT standards

Balanced Scorecard perspective: Learning and Growth

Success factors/Leading questions:

- Is there an orientation at existing IT standards?
- What are the potentials and areas of standardization?
- Which are possible (synergy) effects of standardization?
- How far are the standards already implemented?
- Exists a commitment from all BU's to common IT standards?

Indicators:

- % of standard-conform IT systems to not standard-based IT systems (per BU)
- % of standards implemented to standards developed (per BU)
- # of ICT system suppliers per application area (e.g. ERP, Groupware)
- # of decisions about IT standards
- Degree of commitment to common IT standards (per BU)

Methods: Statistics, Benchmarking, Questionnaire

N. Goal/Task: Internal and external Benchmarking and Monitoring in the field of Knowledge Management

Balanced Scorecard perspective: Internal processes

Success factors/Leading questions:

- Which Knowledge Management areas should be benchmarked?
- Which are appropriate benchmark partners?
- Where do we perform well?
- Where do we perform not so well?
- What are the consequences of benchmarking results?

Indicators:

- # of internal benchmark studies
- # of external benchmark studies
- **Completeness of benchmark studies: % of benchmarked Knowledge Management activities to relevant Knowledge Management activities**
- **Improvements in relevant Knowledge Management areas over time**
- Actuality of benchmark studies
- % of internal benchmark studies to external benchmark studies

Methods: Statistics, Benchmarking

O. Goal/Task: Start-Up-Support for Communities of Practice in the company

Balanced Scorecard perspective: Internal processes

Success factors/Leading questions:

- Which Start-Up-Support services should be offered?
- Does an orientation at demand for support exist?
- Does an orientation towards business goals exist?
- How time- and resource-consuming is the expense for Start-Up-Support?
- How successful is the Start-Up-Support?
- How does the Start-Up-Support improve the speed of community building?
- In which knowledge areas should new Community of Practice's be founded?

Indicators:

- # of supported Start-Up's (per BU)
- % of new Community of Practice which were supported to ones which were not (per BU)
- Satisfaction of ,customers' with support
- Average time spent for start-up-support
- Speed of building of supported communities
- # of Community of Practice's per knowledge area

- Quality of support
- % of successfully supported Start-Up's to non-successful Start-Up Communities (per BU)

Methods: Questionnaire, Statistics, Feedback

P. Goal/Task: *„Help desk“ to answer questions about Knowledge Management in order to support colleagues*

Balanced Scorecard perspective: Internal processes

Success factors/Leading questions:

- How good is the quality of Knowledge Management „help desk“?
- How efficient works the Knowledge Management „help desk“?
- Is there an orientation at demand for help?

Indicators:

- # of requests (per BU)
- # of resolved requests
- % of resolved requests to not resolved requests
- Expense (time/resources) to answer requests
- Quality of „help desk“
- Development of the amount of question asked over time

Methods: Feedback, Statistics

Q. Goal/Task: *Implement and embed Knowledge Management in the company in order to support strategic business goals*

Balanced Scorecard perspective: Learning and growth/Internal processes

Success factors/Leading questions:

- Which business goals should be supported?
- What is the contribution of Knowledge Management to support business goals?
- Which Knowledge Management potentials exist to support business goals?

Indicators:

- # of Knowledge Management activities in order to reduce errors (per BU)
- # of Knowledge Management activities in order to increase innovation (per BU)
- # of Knowledge Management activities in order to shorten time to market (per BU)
- # of Knowledge Management activities in order to improve efficiency (per BU)
- # of Knowledge Management activities in order to manage risks (per BU)

Methods: Statistics, Correlation analysis, 'Story telling', Heuristics, Analysis of Cause-and-Effect Relationships

R. Goal/Task: Develop methods and support strategies for the development of new core competencies

Balanced Scorecard perspective: Learning and growth

Success factors/Leading questions:

- Which core competencies should be developed?
- How should core competencies be developed? (Education and training of employees, acquisitions, etc.)
- Which methods exist?
- Does an orientation towards strategical business goals exist?

Indicators:

- # of Knowledge Management activities related to the development of new core competencies (per BU)

Measures for development of core competencies:

- % of qualified employees under 35
- % of experienced experts
- Qualified employees under 35 to experienced experts ratio
- \$ for acquisition of core competencies (in %)

Methods: Benchmarking, Skill analysis, Evaluation of education and training measures

S. Goal/Task: *Provide appropriate Knowledge Management methods and techniques*

Balanced Scorecard perspective: Learning and growth

Success factors/Leading questions:

- Which Knowledge Management methods and techniques should be provided?
- For what purpose can they be used?
- To which degree are the methods and techniques applicable?
- Are the Knowledge Management methods and techniques the right ones? Are they suitable to business problems?
- How good is the quality of methods and techniques?

Indicators:

- **% of applied methods and techniques (per BU)**
- **Satisfaction of users of methods and techniques**
- # of requests concerning certain methods and techniques (per BU)

Methods: Statistics, Questionnaire, 'Story telling', Feedback, Benchmarking, ICT-based measures

T. Goal/Task: Develop a Knowledge Management strategy

Balanced Scorecard perspective: Learning and growth

Success factors/Leading questions:

- Is the Knowledge Management strategy aligned to strategic business goals?
- Is the Knowledge Management strategy coordinated with goals of BU's?
- Do action plans exist to realize the Knowledge Management strategy? What is the degree of implementation of the Knowledge Management strategy?
- Is the Knowledge Management strategy concrete enough to be applicable?

Indicators:

- **Completeness of Knowledge Management strategy**
- **Degree of implementation of Knowledge Management strategy (per BU)**

Methods: Knowledge Management model, Benchmarking, Questionnaire

U. Goal/Task: Develop a standardized concept for Community of Practices and Books of Knowledge (BoKs)

Balanced Scorecard perspective: Internal Processes

Success factors/Leading questions:

- Is the standardized concept for Community of Practice's applicable?
- Is the standardized concept for Books of Knowledge (BoKs) applicable?
- Are the standardized concepts flexible enough?
- How far are the concepts implemented?
- What is the expense?
- Which dimensions should be standardized? (e.g. systems, processes, content, etc.)
- How is the acceptance of standardized concepts?

Indicators:

- **Degree of standardization of concept for Community of Practices and Books of Knowledge (BoKs)**
- **% of standardized Books of Knowledge (BoKs) to relevant Knowledge Management areas (per BU)**
- **Existence of the key components of the concept and books of knowledge.**
- **Acceptance of the concept by the different business areas and within the knowledge management groups.**
- Communication efforts in making the concept explicit.
- % of Community of Practices following the standardized concept to not standardized Community of Practices (per BU)

Methods: Statistics, Questionnaire, Benchmarking

V. Goal/Task: Provide Coaches to help Community of Practices renew their Knowledge Management efforts

Balanced Scorecard perspective: Learning and growth

Success factors/Leading questions:

- Which skills need coaches to have?
- How are coaches accepted from Community of Practice's?
- What are the experiences and 'lessons learned' from coaching?

Indicators:

- **# of KM-related coaching activities (per BU)**
- **Expense (time/resources) for KM-related coaching activities (per BU)**
- **Quality/Effects of coaching: % of renewed Knowledge Management efforts due to coaching activities (per BU)**
- **Satisfaction level of the Community of Practice's regarding the help of coaches**
- **# of coaches provided**
- **New Knowledge Management activities in the Community of Practice's**

Methods: Statistics, Interviews, Feedback, 'Story telling'

W. Goal/Task: Promote Knowledge Management activities internally and externally

Balanced Scorecard perspective: Customers

Success factors/Leading questions:

- How well known is the Knowledge Management Community of Practice?
- Which Knowledge Management activities should be promoted?
- Who should know something about the Knowledge Management Community of Practice?

Indicators:

- # of promotion/communication activities
- External degree of awareness of Knowledge Management Community of Practice
- Internal degree of awareness of Knowledge Management Community of Practice
- % of people reached with the communication to people who were planned to be reached
- Diversity of communication channels
- Support provided by management resulting from the communication

Methods: Awareness analysis, Measurement methods of Marketing/Corporate Communication

X. Goal/Task: Organize and facilitate Knowledge Management Community of Practice meetings

Balanced Scorecard perspective: Internal processes

Success factors/Leading questions:

- How good is the quality of Community of Practice Meetings?
- What are the benefits and results of Community of Practice Meetings?
- How effective are those meetings?

Indicators:

- # of Knowledge Management Community of Practice meetings
- # of participants at Knowledge Management Community of Practice meetings (per BU)
- Satisfaction of participants
- # of decisions from Knowledge Management Community of Practice meetings

Methods: Statistics, Evaluation of Knowledge Management Community of Practice Meetings

4.3.2 Performance lag indicators

Besides the indicators, which have a more or less immediate influence, activities of the communities can have effects which are delayed and have a long term influence. Also, the work and results of communities often appear in the work of teams and business units, not in the communities themselves [see Wenger/Snyder 2000]. This will certainly also be the case in this particular community since their attempt is to achieve results in projects and processes on the business unit level. Therefore, it is useful for the particular Balanced Scorecard to distinguish between lead indicators on the one hand, which are the 'performance drivers' and which can be related to the work of the community but which quite often have a long-term-effect, and on the other hand lag indicators which show delayed results.

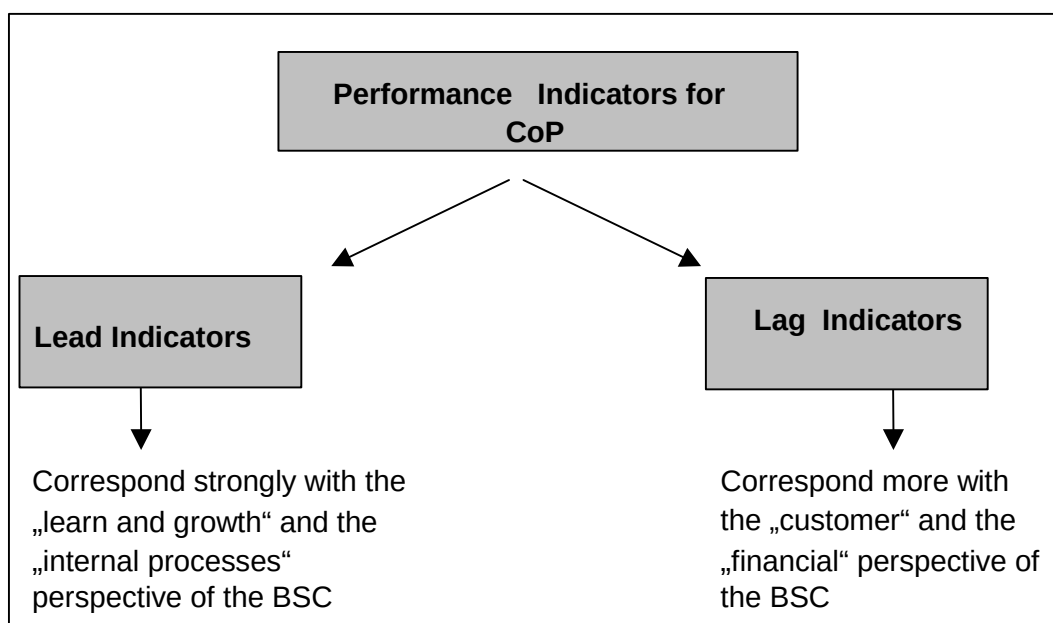


Figure 30: Lead and lag indicators

When working on this project, it became evident that lead indicators strongly correspond to the "learning and growth" as well as to the "internal processes" perspective of the Balanced Scorecard, whereas lag indicators relate more to the "customer" and "financial" perspective. After lead indicators have been identified in chapter 4.3.1, lag indicators for measuring the performance of the Community on the Corporate Level will be presented in the following. Again, all of the four perspectives of the Balanced Scorecard were taken into account and for each of the perspective, the following lag indicators have been identified:

Perspective Financial – Lag Indicators:

- Increase of profit (per BU)
- Increase of ROI
- Value added resulting from KM Community of Practice
- % of revenue from new products

Perspective Customers – Lag Indicators:

- Customer satisfaction index
- Decrease of # of customer complaints
- Customer retention
- Brand loyalty
- Market share
- Proportion of sales by repeat customers
- Number of customer alliances and their value
- # of customer-related KM activities
- # of online sales
- # of online customer contacts
- Growth in business volume

Perspective Internal Processes – Lag Indicators:

- Increase of efficiency
- Increase of speed of problem solving
- Improved Time-to-market of solutions
- Growth of productivity (per BU)
- Decrease of error rate
- Spread of the success story of the different new Communities of Practice
- Satisfaction index of 'Community of Practice customers' with support services
- Improved integration of IT systems
- Increased product and process quality
- Improvements in managing risks
- Improvements (time, quality, productivity, costs) in new core competencies
- Cost reduction due to synergy effects (per BU)
- Cost reduction due to integration effects (per BU)
- Cost reductions due to standardization

Perspective Learning and Growth – Lag Indicators:

- # of ideas and new products
- Increased innovation
- # of products developed together across business unit boundaries
- Improvement of products
- # of new core competencies
- Speed of reorientation
- Usage of knowledge resources
- Relevance of KM in DaimlerChrysler
- Level of acceptance of Community of Practice
- Satisfaction of Community of Practice members
- Loyalty of Community of Practice members
- Satisfied users of the online resource

4.3.3 Cause-and-effect relationships

Kaplan/Norton argue that a strategy is a set of hypotheses about cause and effect. A measurement system should make the relationships (hypotheses) among objectives (and measures) in the various perspectives explicit so that they can be managed and validated. The chain of cause and effect should pervade all four perspectives [Kaplan/Norton 1996b]. With regards to communities, companies should try to identify cause-and-effect relationships between network/community activities and its effects. The following figure is showing a few examples of such cause-and-effect relationships in case of the DaimlerChrysler Knowledge Management Community of Practice:

BSC perspective:



Examples of cause-and-effect-relationships:

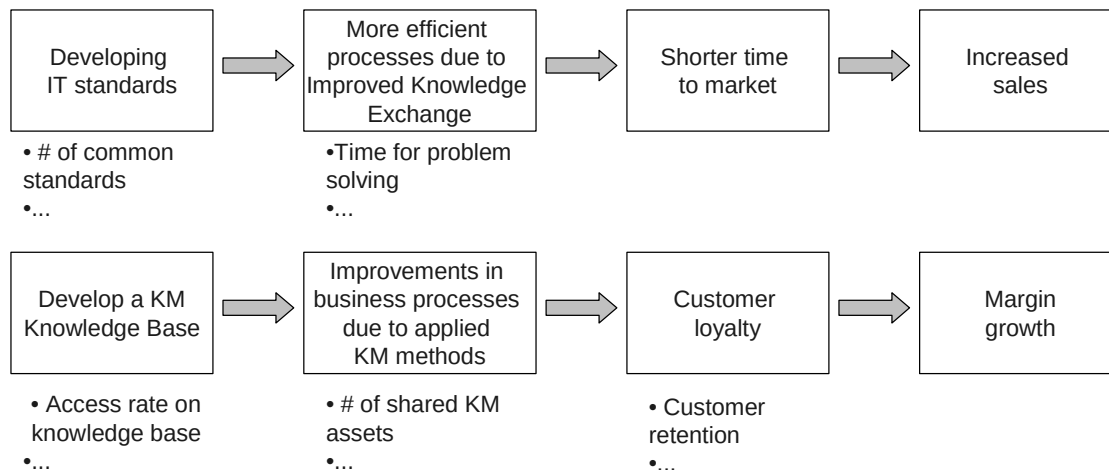


Figure 31: Cause-and-Effect Relationships

A properly constructed Balanced Scorecard should tell the story of the business strategy or the strategy of the organizational unit. It should identify and make explicit the sequence of hypotheses about the cause-and-effect relationships between outcome measures (lag indicators) and the performance drivers of those outcomes (lead indicators) [Kaplan/Norton 1996b].

4.3.4 Methods for measuring the performance indicators

In order to assess the performance of the Knowledge Management Community of Practice at Daimler Chrysler and to validate the performance indicators, different methods can be used. As explained in chapter 4.3.1, we have assigned possible methods to each task/goal of the Knowledge Management Community of Practice and the related performance indicators. E.g. a lot of measures can be implemented electronically as ICT-based measures. Different forms of interviews, questionnaires and analyses in particular help to assess 'soft' issues like motivation, awareness, communication and so forth. It would lead too far to explain these methods for measuring here in detail. Many of these methods can be adapted from organizational development or cultural change projects where it e.g. is necessary to assess changes in corporate culture [see e.g. Stone 1996].⁴

⁴ In the context of change management measures are used in many diverse ways – in both monitoring or inducing cultural change. Many case studies proclaim 'soft' benefits (improvements in communications, morale, 'team spirit') from the use of methods like surveys, etc. [Stone 1996]

The following table gives an overview of methods for a 'community-based measurement' in case of the DaimlerCrysler Knowledge Management Community of Practice:

Methods for community-based measurement
Statistics
Benchmarking
Questionnaire
ICT-based measures
User feedback
Satisfaction analysis
Correlation analysis
Analysis of Cause-and-Effect Relationships
Skill analysis
Awareness analysis
Measurement methods of Marketing/Corporate Communication
Evaluation of Knowledge Management Community of Practice Meetings
Interviews
„Story telling“/Story analysis
Alignment with Knowledge Management model
Evaluation of education and training measures
Stakeholder analysis
Communication analysis
Acceptance analysis
Reporting

Table 2: Methods for community-based measurement

Snyder/Wenger come to quite similar results. An internal document of the Social Capital Group give the following examples of community-based measurement as it is used in different companies [Social Capital Group 2000]: story collections, interviews, surveys, individual evaluation and recognition, community projects, data and statistical measures.

4.3.5 Indicators for the „Functioning“ of the Knowledge Management Community of Practice

Even it was not the goal of this project to measure work or social processes in the Knowledge Management Community of Practice on Corporate Level, but to consider effects and the performance of it, some indicators have been identified for the question how good the Community of Practice is functioning. This was made since also aspects of social behavior and state of communities have effects on the work conditions and therefore also on the question how well a community is performing. The following indicators have been identified for measuring the “functioning” of communities:

- Motivation level of community members
- Amount of meetings
- Amount of communication
- Level of commitment of the community members
- Amount of learning activities
- Average time of membership
- Fluctuation rate of members
- Loyalty of members
- Reaction time
- Average professional competency years
- Amount of resources provided by management

4.4 Balanced Scorecard for the Knowledge Management Community of Practice

4.4.1 Consolidating the performance indicators for the Balanced Scorecard

As project work has shown, indicators for the tasks/goals of the Knowledge Management Community of Practice mainly correspond with the perspective 'learning and growth' as well as with the perspective 'internal processes' of the Balanced Scorecard. However, to build a usable and practicable Balanced Scorecard, the lead and lag indicators listed in the previous chapters have to be consolidated by finding the most relevant ones.

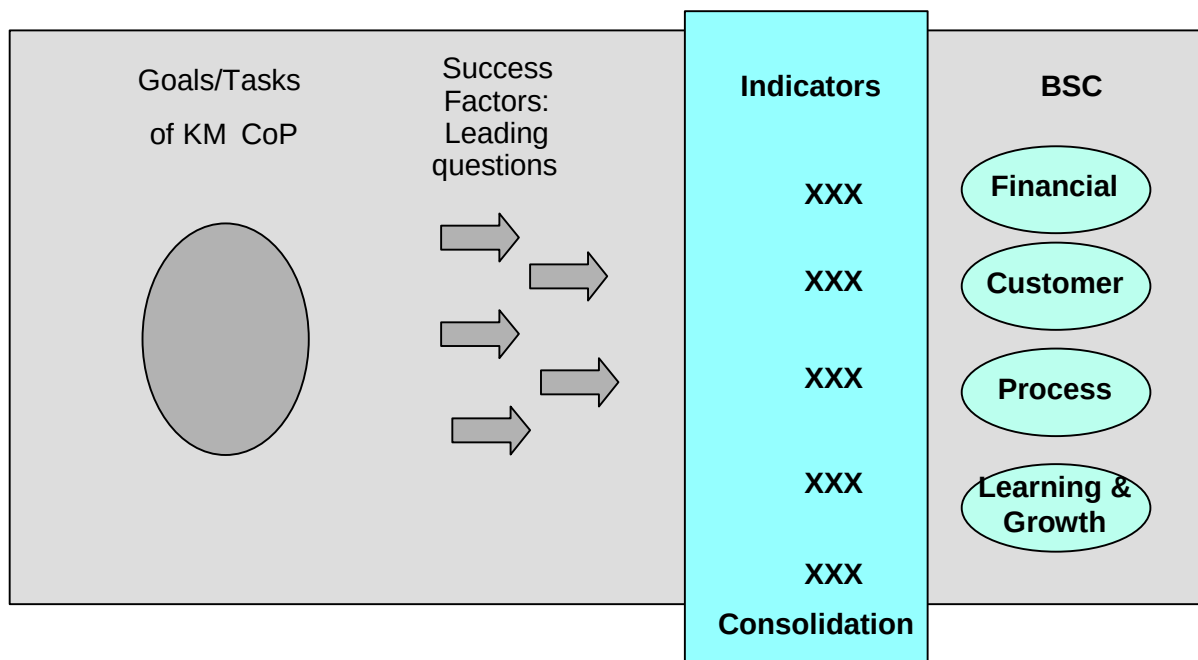


Figure 32: Consolidation of indicators

According to the concept of the Balanced Scorecard, the perspectives 'learning and growth' as well as 'internal processes' should not be seen isolated from the two other perspectives 'customers' and 'financials' which correspond more strongly with lag indicators. Rather, it is very important to find the most relevant lead and lag indicators as well as to combine the chain of cause-and-effect relationships of all measures with financial goals [Kaplan/Norton 1997].

4.4.2 The (consolidated) Balanced Scorecard for the Community of Practice on Corporate Level about Knowledge Management

Since the proposed (lead and lag) indicators are certainly useful, but in their sum are too many for a Balanced Scorecard which should be usable and practical enough, a consolidation has been made as proposed above. In this consolidation process, for each perspective of the Balanced Scorecard, some (lead and lag) indicators have been identified which seem to be the most important ones to help the Community on Practice on Corporate Level to measure their efforts and the performance of their work. These indicators are the following ones:

The Perspective „Learning and Growth“:

- # of realized KM projects
- # of knowledge transfer projects (across BU boundaries)
- # of new core competencies
- # of ideas and new products
- # of KM expertise areas
- Access rate on knowledge base over time (per BU)
- % of experienced experts to all employees
- \$ for acquisition of core competencies
- \$ spent for ICT systems

The Perspective „Internal Processes“

- Time-to-market of solutions
- # of products developed together across business unit boundaries
- # of KM activities across business units
- # of shared KM assets (methods, best practices, systems, etc.)
- # of Communities or Practice per knowledge area
- # of days to consolidate a KM source
- # of resolved ‚KM help desk‘ requests
- % of standardized Books of Knowledge (BoKs) to relevant KM areas (per BU)
- % of defined KM activities to already implemented KM activities
- Increase in speed of problem solving
- Increase in product and process quality (e.g. reduced error rate)
- Reduced costs due to synergy effects, integration, standardization

The Perspective „Customers“:

- Customer satisfaction index
- Customer complaints
- Customer retention
- Brand loyalty
- Market share
- Proportion of sales by repeat customers
- Number of customer alliances and their value
- # of customer-related KM activities

The Perspective „Financials“:

- Profits resulting due to KM Communities of Practice
- ROI, EVA,...
- Sales increase
- % of revenue from new products

Therefore, with these indicators on the different perspective of the Balanced Scorecard, the following (consolidated) Balanced Scorecard is proposed to the Knowledge Management Community of Practice:

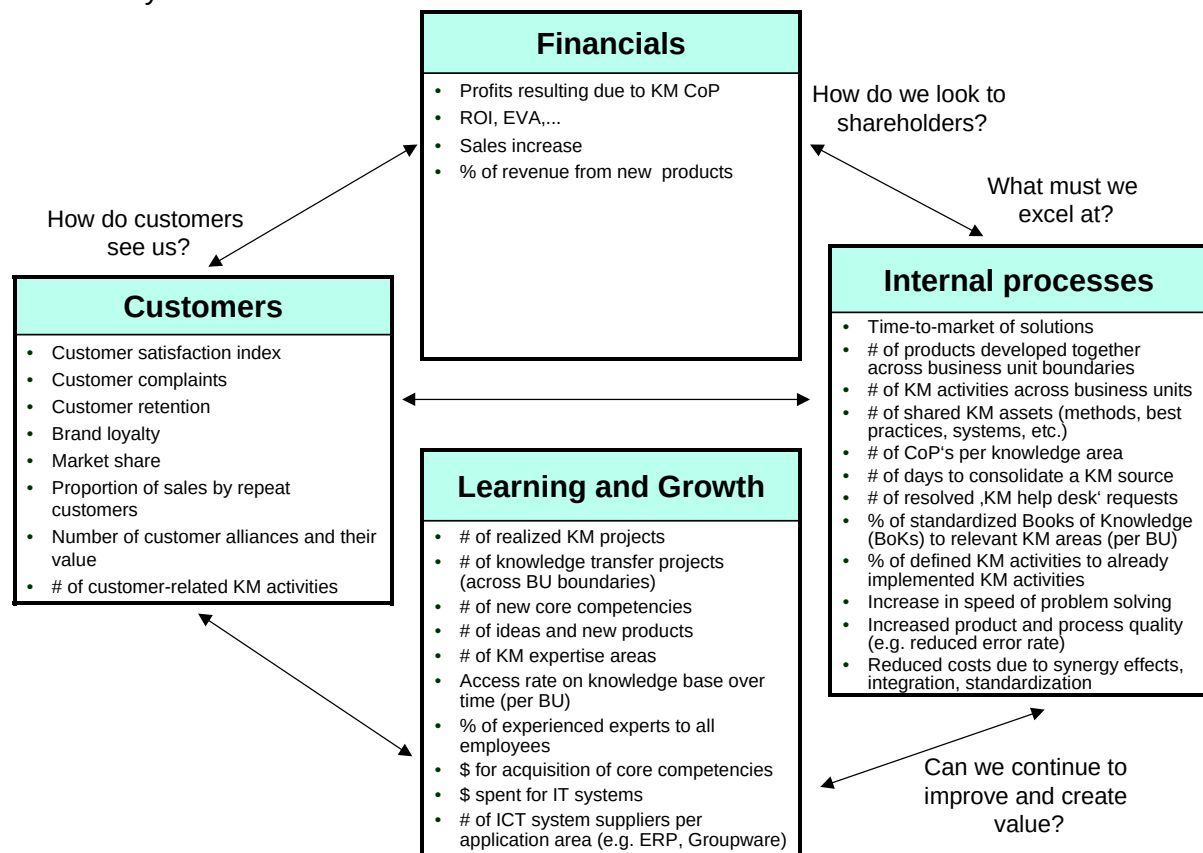


Figure 33: Balanced Scorecard for the Knowledge Management Community of Practice

4.5 Alternatives to build and adapt the Balanced Scorecard in DaimlerChrysler

Although it was the topic of the bilateral project to develop a BSC for the DaimlerChrysler Knowledge Management Community of Practice, we came to the result, that a BSC is not in any case the best and only solution to assess the performance of a network/community. To make a decision whether a BSC should be implemented or not, it might be helpful to keep in mind what the BSC actually represents, namely a management and measurement tool and a framework to translate corporate strategy into measurable goals [Kaplan/Norton 1996b, Letza 1996]. Therefore, to achieve significant benefits it is in particular of importance to develop the BSC in accordance with corporate strategy.

With respect to developing a performance measurement system for the DaimlerChrysler Knowledge Management Community of Practice, there exist at least two possibilities:

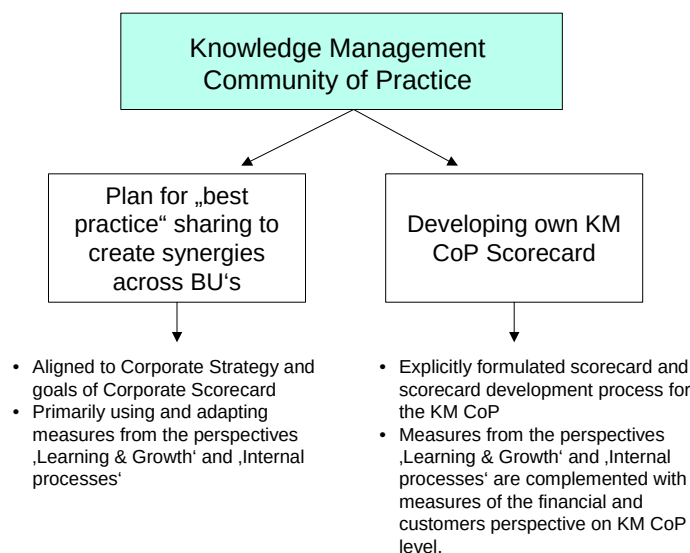


Figure 34: Alternatives to build and adapt the Balanced Scorecard in DaimlerChrysler

Both alternatives – developing a plan for „best practice“ sharing to create synergies across Business Units or developing an own Balanced Scorecard - are described in the next two paragraphs.

4.5.1 Alternative 1: Plan for „best practice“ sharing to create synergies across Business Units

According to Kaplan/Norton [Kaplan/Norton 1996b], the BSC can be used to manage cross-business synergies and corporate initiatives. This includes opportunities like developing and

sharing knowledge about critical technologies and core competencies, coordinating efforts, sharing resources, etc.

To manage cross-business synergies and corporate initiatives, Kaplan/Norton suggest for support functions to build on the corporate scorecard and the scorecards of the individual business units and then to develop a plan for „best practice“ sharing to create synergies across BU's.

Developing such a plan to serve the objectives of individual BU's also makes sense for the Knowledge Management Community of Practice, since the Knowledge Management Community of Practice in some way works similar like a support function or central staff function on corporate level.

Following this first alternative, the Knowledge Management Community of Practice does not necessarily have to develop an own Balanced Scorecard. Rather, the Knowledge Management Community of Practice should develop a plan how the goals of the Corporate Scorecard as well as the goals of the Business Units BSC's can be supported. This plan determines how the Knowledge Management Community of Practice supports the strategic goals of the company and of the BU's in the field of Knowledge Management.

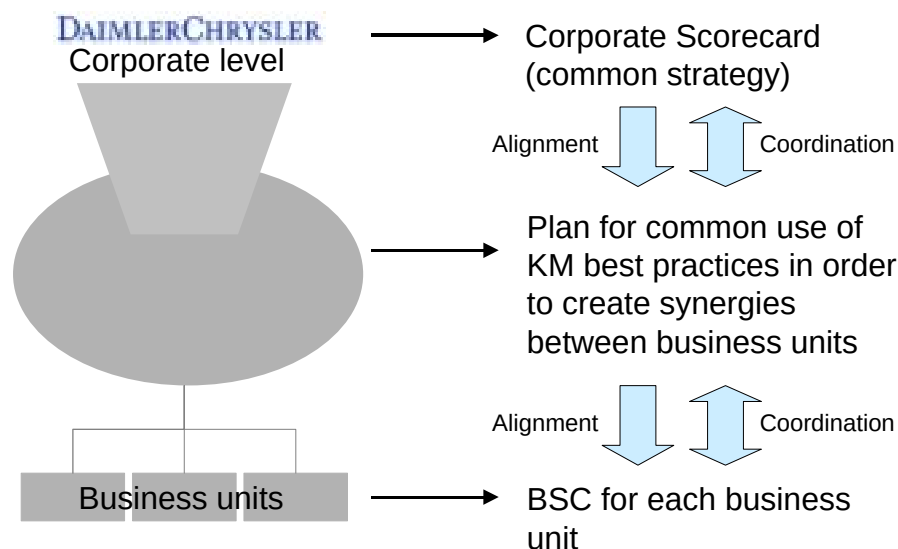


Figure 35: Alignment and coordination with common strategy and business units

When choosing this alternative, the Knowledge Management Community of Practice anyhow can make use of performance indicators as suggested in this project report as well as the suggested suitable methods to measure their performance.

The goals of the Corporate Scorecard serve to keep the work of the Knowledge Management Community of Practice 'on track'. In particular, the Corporate Scorecard delivers strategically relevant defaults for the work of the Knowledge Management Community of Practice. In this

way the work of the Knowledge Management Community of Practice is aligned to corporate strategy and also interlinked to financial goals.

The next figure visualizes this alternative [similar Kaplan/Norton 1996b]:

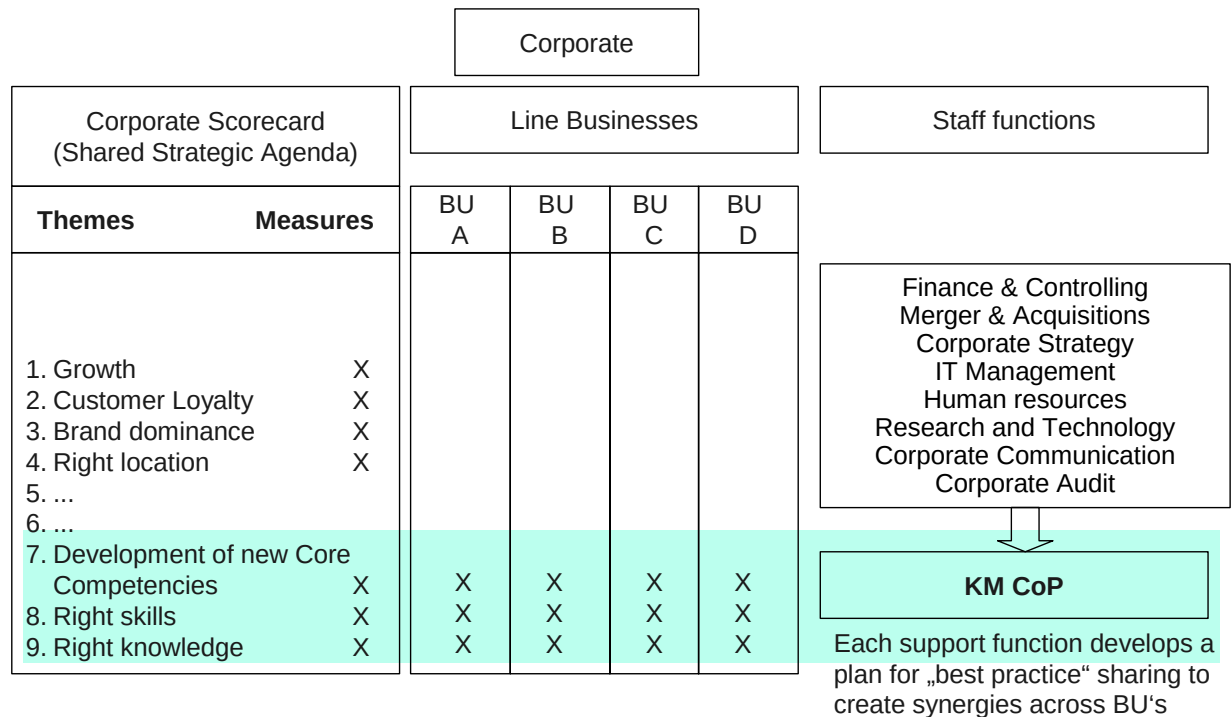


Figure 36: Plan for common use of Knowledge Management best practices in order to create synergies between business units

4.5.2 Alternative 2: Developing own Balanced Scorecard

The second alternative is, that the Knowledge Management Community of Practice develops an own Balanced Scorecard on Community of Practice level.

In this case, the measures of the perspective ‚Learning and growth‘ and ‚Internal processes‘ have to be completed with measures for the other two BSC perspectives. Of course - in accordance with Intellectual Capital approaches - also other, additional perspectives are possible (e.g. a human perspective).

In any case, the measures of a Knowledge Management Community of Practice Scorecard should be aligned to the Corporate Scorecard and also be coordinated with the BU's BSC's.

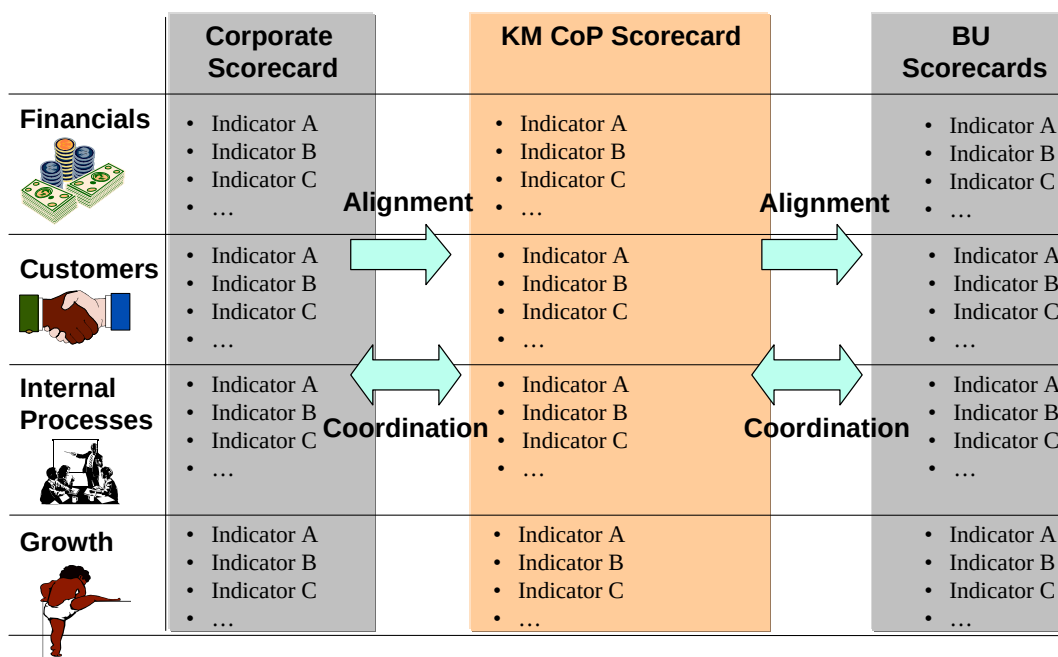


Figure 37: Alignment of Knowledge Management Community of Practice Scorecard

Whether Alternative 1 or Alternative 2 (independent scorecard or not) should be taken, is at last also a political decision within the company. The tendency of an independent Knowledge Management Community of Practice scorecard is to strengthen the Knowledge Management Community of Practice within the company. On the other hand, if the Knowledge Management Community of Practice Scorecard is not developed properly in accordance with the BU's, it is very likely that an „additional“ scorecard leads to conflicts in the company.

Finally, the Knowledge Management Community of Practice Scorecard which has been developed within this project can only give an idea of how such a scorecard might look like. The task to develop a really well-adapted and integrated balanced scorecard is a very expensive process that in any case should be carried out by DaimlerChrysler, since corporate strategy and internal issues like corporate culture have to be considered [Letza 1996].

5 IMPLICATIONS FOR DAIMLERCHRYSLER AND THE CC KNN

5.1 Implications for DaimlerChrysler

There are two major implications of this work for DaimlerChrysler. Firstly, one of the tasks the Knowledge Management Community wanted and wants to resolve in the next time is to establish metrics for Knowledge Management benefits (DaimlerChrysler 2000e). Therefore, the work of the bilateral project as it is described in this working paper is a contribution to this task and DaimlerChrysler can use these insights for their particular work. Especially the overview of measurement methods, the elaborated Balanced Scorecard as well as discussed issues like ICT-based performance measurement can be of special interest in this regard.

Secondly, DaimlerChrysler has to decide if they want to adapt the proposed Balanced Scorecard. Regardless of such smaller adaptations, DaimlerChrysler has to define if they want to use this particular Balanced Scorecard to match the measurement needs of the Knowledge Management Community on Corporate Level without taking and therefore neglecting measures from an existing Corporate Scorecard at DaimlerChrysler. Or, alternatively, they could also think of bringing the proposed Balanced Scorecard for the Knowledge Management Community in line with the Corporate Scorecard at DaimlerChrysler.

It even might be possible, that a Balanced Scorecard – if not implemented properly - causes more needless ‘overhead’ and effort or even far reaching problems rather than bringing benefits for the company. Eventually it will make more sense for DaimlerChrysler to start pragmatically with a more simple and flexible kind of measurement (the proposed performance indicators in this report can be used as a starting point) in order not to overstress the Knowledge Management Community of Practice with measurement activities. One also must not forget, that at least in some parts of DaimlerChrysler already a BSC system exists. Therefore, the challenge for DaimlerChrysler is to align the different BSC’s to each other as well as to corporate strategy.

5.2 Implications for the Competence Center Knowledge Networks

The bilateral project has broadened our understanding of the topic of network performance and its measurement. The project has shown in the concrete case of the DaimlerChrysler Knowledge Management Community of Practice, how a Balanced Scorecard for a community/network can be developed.

Insights for the Competence Center refer at first to the **proceeding of how a performance measurement system for communities/networks can be developed**. Since this is a highly (community-) specific and individual task, the process of developing a performance measurement system should be integrated into the process of network building in order to achieve transparency and commitment of the community members. In this context it also became clear, that the development of a measurement system has to start with the tasks/goals of the community. From that, success factors can be derived which then allow to determine performance indicators. The consolidation of performance indicators finally might be used to develop a (balanced) scorecard for communities.

Where the project also brought valuable insights is the topic of network performance. We have deepened our understanding of the **relevant aspects of 'high performance'** in terms of networks/communities. Further, we had a look at the **'enabling conditions' and 'soft issues'** that have a strong influence on network performance. An important insight of the project was, that these influencing factors also have to be measured somehow in order to sustain or improve the performance of networks. These findings we have underpinned in this report with comparable research results from the area of team performance measurement.

To measure such 'soft issues' and influencing factors, a scorecard for itself cannot be the only measurement tool. As the project report shows, many more suitable **measurement methods** exist (see 4.3.4). Many of those methods can be adapted from the field of change management and organizational development.

The chapter about **'Performance measurement and ICT'** delivers some basic thoughts about measures that can be implemented electronically. In particular if a network/community uses an online resource or knowledge base, ICT-based measures have an important role to play. The examples of ICT-based measures illustrate, that measures are not only necessary to monitor and control the performance but also to motivate community members (e.g. feedback/assessment of articles motivates their authors).

As the bilateral project has shown additionally; a Balanced Scorecard is not in any case the appropriate choice. Quite often it will be easier and more pragmatic to use a number of suitable network performance indicators and to assess the related goals, influencing conditions, etc. with different flexible and easy-to-use methods. In order to avoid needless 'overhead' of measurement efforts the question for networks/communities to be answered always has to be: why and for what purpose do we have to measure performance? A complete 'stand-

alone' Balanced Scorecard for networks only makes sense, if strategic goals should be translated directly into action through the network. It should be considered, that the effort which is necessary to develop, implement and use such a scorecard is rather high. Further, the development of a BSC has to be well integrated with corporate strategy. Therefore, the development of a BSC in any case is a strategic issue.

What also has been substantiated in the bilateral project is the **two-staged performance measurement approach** of the Competence Center that consists of the 'Knowledge Network Scorecard' and the 'Network Health Check'. As already mentioned, a Balanced Scorecard does not cover all aspects of network performance and measurement. The combination of a Balanced Scorecard with the 'Network Health Check' comprises many performance issues for which the single scorecard is not made for. E.g. the 'Health Check' addresses the assessment of the 'enabling conditions' which influence network performance, the topic of adequate tool support, the whole process of network building, and so forth whereas the Balanced Scorecard primarily has the function to set and keep control of performance goals for the network which are derived from corporate strategy. Altogether, the role of a Balanced Scorecard for networks has been clarified through the bilateral project.

Last not least, to adapt the results of the bilateral project for other networks, the Competence Center has to consider that the DaimlerChrysler Knowledge Management Community of Practice has some very special characteristics. One speciality is, that the community works directly on the topic of knowledge management. Further, the Knowledge Management Community of Practice works in a strategically highly relevant area on corporate level. Developing 'meta-capabilities' for DaimlerChrysler in the area of knowledge management is a crucial task for the Knowledge Management Community of Practice. The actual implementation of knowledge management practices then takes place in the different business units and projects in DaimlerChrysler. This special constellation has been leading to the performance indicators, the scorecard and the alternatives how to build it as described in this report. For a network/community that works closer involved into a certain business process than the DaimlerChrysler Knowledge Management Community of Practice, the definition of network performance and its measurement probably would look different.

6 APPENDIX

6.1 Conducted interviews: Questionnaire⁵

1. Clarifying goals of community

- **What are essential goals and tasks of the DaimlerChrysler Knowledge Management Community? Are these goals formulated and communicated clearly?**
- How do these goals look like concretely?
- **How do the planned activities of the community look like?**
- What is the timeframe for these goals/activities?
- **What are critical success factors to achieve the goals?**
- **What are the 'customers' of the DaimlerChrysler Knowledge Management Community? What are their expectations?**
- **What are the core services/performance drivers of the DaimlerChrysler Knowledge Management Community?**

2. Performance measures (common questions)

- **Which measures are used already in your company in order to measure knowledge, knowledge management activities and in particular community activities?**
- **Which other performance measures would be helpful in order to measure knowledge management activities?**
- **Which other performance measures would make sense in order to measure community activities?**
- What purpose should performance measures in the area of knowledge management serve? What are criteria for measurement success?

3. Performance measures (specific questions)

- **How can performance in case of the DaimlerChrysler Knowledge Management Community be defined? What is their contribution to value creation?**
- **What is the contribution of the DaimlerChrysler Knowledge Management Community to**
 - i. **Business goals (e.g. innovation, risk management, efficiency)?**
 - ii. **Business units?**

⁵ The bold formatted questions we have estimated as questions of higher priority.

iii. Community members?

- **Do already performance measures exist for the DaimlerChrysler Knowledge Management Community?**
- **Which performance measures do you think are suitable for the DaimlerChrysler Knowledge Management Community? Which are not? Why?**
- Does a Corporate Scorecard exist? Exists a Balanced Scorecard on business unit level? If yes, are the different scorecards aligned to each other? Are they aligned to corporate strategy?
- To which of the perspectives of the Balanced Scorecard can the performance measures be assigned to?
- Do these performance measures also fit for other communities or are they too specific?
- Which measures express in particular the strategy of DaimlerChrysler? Which express the goals of the DaimlerChrysler Knowledge Management Community?
- **What are influencing factors for the DaimlerChrysler Knowledge Management Community? How do these factors influence community performance?**
- **Which tools are used by the DaimlerChrysler Knowledge Management Community? Does the community use a specific knowledgebase?**

6.2 General suggestions of performance measures

Human capital indicators

- Reputation of company employees with head-hunters
- Years of experience in profession
- Rookie ratio (percentage of employees with less than two years' experience)
- Employee satisfaction
- Proportion of employees making new idea suggestions (proportion implemented)
- Value added per employee
- Value added per salary dollar

Organizational capital indicators

- Number of patents
- Income per R&D expense
- Cost of patent maintenance
- Project lifecycle cost per dollar of sales
- Number of individual computer links to the database
- Number of times the database has been consulted
- Contributions to the database
- Upgrades of the database
- Volume of IS use and connections
- Cost of IS per sales dollar
- Income per dollar of IS expense
- Satisfaction with IS service
- Ratio of new ideas generated to new ideas implemented
- Number of new product introductions
- New product introductions per employee
- Number of multi-functional project teams
- Proportion of income from new product introductions
- Five year trend of product life cycle
- Average length of time for product design and development
- Value of new ideas (money saved, money earned)

Customer and relational capital indicators

- Growth in business volume
- Proportion of sales by repeat customers
- Brand loyalty
- Customer satisfaction
- Customer complaints
- Product returns as a proportion of sales
- Number of supplier/customer alliances and their value
- Proportion of customer's (supplier's) business that your product (service) represents (in dollars terms)

Source: Developed from SMAC 1998.

Possible “New Metrics”

- The number of new colleague to colleague relationships spawned – this will hopefully encourage the exchange of tacit knowledge between knowledgeable individuals. The World Bank’s and Johnson & Johnson’s knowledge fairs/exchanges are geared to promoting an increase in these types of relationships and transfer of tacit knowledge.
- The reuse rate of “frequently accessed/reused” knowledge.
- The capture of key expertise in an online way (i.e. the number of key concepts that are converted from tacit to explicit knowledge in the knowledge repositories and used by members of the organization).
- The dissemination of knowledge sharing (i.e. distribution of knowledge) to appropriate individuals.
- The number of knowledge sharing proficiencies gained – at AC, they have developed six levels of knowledge sharing proficiencies whereby one cannot be promoted unless one reaches at least level 5.
- The number of new ideas generating innovative products or services.
- The number of lessons learned and best practices applied to create value-added (i.e. decreased proposal writing/development time, increased customer loyalty and satisfaction, etc.).
- (The number of patents/trademarks produced + number of articles or books written + number of talks given at conferences or workshops or trade shows)/number of employees – the higher the number, the better.
- (Professional development/training dollars + R&D Budget dollars + Independent R&D dollars)/number of employees - the greater the number, the better.
- The number of “serious” anecdotes presented about the value of the organization’s knowledge management systems.
- The number of “apprentices” that one mentors, and the success of these apprentices as they mature in the organization.
- Interactions with academicians, consultants, and advisors. [Vassiliadis/Raimann 2000]

7 LITERATURE

Adams, Eric C./Freeman, Christopher (2000):

Communities of Practice: bridging technology and knowledge assessment, in: Journal of Knowledge Management, Vol. 4, No.1, pp.38-44, 2000

Allee, Verna (1999):

The art and practice of being a revolutionary, in: Journal of Knowledge Management, Vol. 3, No.2, pp.121-131, 1999

Arveson, Paul (1999):

The Balanced Scorecard and Knowledge Management,
<http://www.balancedscorecard.org/bscand/bsckm.html>, 1999

Beech, Nic/Crane, Oliver (1999):

High performance teams and a climate of community, in: Team Performance Management, Vol. 5, No. 3, pp. 87-102, 1999

Bleicher, K. (1991):

Das Konzept Integriertes Management, Frankfurt a.M., Campus Verlag, 1991

Brown, M.G. (1994):

"Is your measurement system well-balanced?", in: Journal for Quality and Participation, Vol. 17, October/November, pp. 6-11, 1994

Champoux, J.E. (1996):

Organizational Behaviour: Integrating Individuals, Groups, and Processes, St. Paul, West Publishing Company, 1996

Collins, D.J. (1996):

"Organizational Capability as a Source of Profit", in: B. Moingeon and A. Edmondson (Eds.) Organizational Learning and Competitive Advantage, London, Sage, 1999

DaimlerChrysler (1999a):

Communities of Practice: Lessons learned from Auburn Hills' Tech Clubs, DaimlerChrysler, 1999

DaimlerChrysler (2000a):

DaimlerChrysler - Company At A Glance, <http://www.daimlerchrysler.com>, DaimlerChrysler, 2000

DaimlerChrysler (2000b):

Interview with a member of the Community of Practice on Corporate Level about Knowledge Management, March 2000

DaimlerChrysler (2000c):

Interview with a member of the Community of Practice on Corporate Level about Knowledge Management, April 2000

DaimlerChrysler (2000d):

Interview with a member of the Community of Practice on Corporate Level about Knowledge Management, May 2000

DaimlerChrysler (2000e):

DaimlerChrysler Knowledge Management Community, Internal document, DaimlerChrysler Corporate University (DCU), May 2000

DaimlerChrysler (2000f):

Knowledge Management (KM) at DaimlerChrysler: Current state, opportunities and implications for action, Draft version, DaimlerChrysler Corporate University (DCU), May 2000

Edvinsson, Leif/Malone, Michael S. (1997):

Intellectual Capital: Realizing your company's true value by finding its hidden brainpower, New York, Harper Business, 1997

Enkel, E./ Seufert, A./ Raimann, J./ Vassiliadis, S./ Wicki, Y. (2000):

Towards a Knowledge Network Methodology - a first outline of the methodology handbook -, Internal document draft, KnowledgeSource University of St. Gallen, 2000

Flamholtz, Eric G. (1989):

Human resource accounting, San Francisco, Jossey-Bass Publishers, 1989

Ghalayini, Alaa M./Noble, James, S. (1996):

The changing basis of performance measurement, in: International Journal of Operations & Production Management, Vol. 16, No. 8, pp.63-80, 1996

Hein, Bettina (1996):

Practical Approaches to Measuring Knowledge and Competence, Thesis, 1996

IMD (1996):

Skandia Assurance and Financial Services: Measuring and Visualizing Intellectual Capital, IMD Case 396-116-1, 1996

Ingram, Hadyen (1996):

Linking teamwork with performance, in: Team Performance Measurement: an International Journal, Vol. 2, No. 4, pp. 5-10, 1996

Kaplan, Robert S./Norton, David P. (1992):

The balanced scorecard – measures that drive performance, in: Harvard Business Review, Vol.70, Issue 1, 1992

Kaplan, Robert S./Norton, David P. (1996a):

Using the balanced scorecard as a strategic management system, in: Harvard Business Review, Vol.74, Issue 1, 1996

Kaplan, Robert S./Norton, David P. (1996b):

The balanced scorecard: translating strategy into action, Boston, Harvard Business School Press, 1996

Kaplan, Robert S./Norton, David P. (1997):

Balanced Scorecard: Strategien erfolgreich umsetzen, Stuttgart, Schäffer-Poeschel, 1997

KnowledgeSource (2000a):

Internal presentation: Survey findings, KnowledgeSource St. Gallen, 2000

KnowledgeSource (2000b):

Internal presentation: Methodology, KnowledgeSource St. Gallen, 2000

Letza, Stephen, R. (1996):

The design and implementation of the balanced business scorecard, An analysis of three companies in practice, in: Business Process Reengineering & Management Journal, Vol. 2, No. 3, pp. 54-76, 1996

Liedtka Jeanne (1999):

Linking competitive advantage with communities of practice, in: Journal of Management Inquiry, Vol. 8, Issue 1, pp.5-12, 1999

Merkle, Martina (1999):

Bewertung von Unternehmensnetzwerken: Eine empirische Bestandsaufnahme mit der Balanced Scorecard, St. Gallen, 1999

Montague Institute (1998):

Measuring intellectual assets, <http://www.montague.com/le/le1096.html>, Montague Institute, January, 1998

Moore, Andy (1998):

An environment for innovation: American Management Systems, KMWorld, Vol. 7, Issue 1, January, 1998

Nonaka, I./ von Krogh, G. (1999):

Knowledge Assets, Knowledge Conversion and Competitive Advantage, Working Paper, 1999

Nonaka, I./Konno, N. (1998):

The Concept of "Ba": Building a Foundation for Knowledge Creation. In: California Management Review, Vol. 40, No. 3, pp. 40-55, 1998

Nonaka, I./Reinmoeller, P. (1998):

The Art of Knowledge: Systems to Capitalize on Market Knowledge; European Management Journal; Vol. 16, Issue 6, pp. 673-684, 1998

Nonaka, I./Takeuchi, H. (1997):

The knowledge creating company: How Japanese Companies Create the Dynamics of Innovation. New York: Oxford University Press, 1997

O'Dell, C./ Grayson , C. J. (1998):

If Only we Knew what we Know. The Transfer of Internal Knowledge and Best Practice, New York, 1998

Porter, Michael E. (1985) :

Competitive Advantage, New York, Free Press, 1985

Prahalad, C.K./ Hamel, G. (1990):

The Core Competence of the Corporation, in: Harvard Business Review, May-June, pp. 71-91, 1990

Quinn, James Brian (1992):

Intelligent Enterprise: A Knowledge and Service Based Paradigm for Industry, New York, Free Press, 1992

RSA Inquiry (1995):

Tomorrow Company: The Role of Business in a Changing World, London, 1995

Ruggles, Rudy (1998):

The State of the Notion: Knowledge Management in Practice, in: California Management Review, Vol. 40, No. 3, 1998

SAP AG (1999):

SAP Strategic Enterprise Management: Translating Strategy into Action: The Balanced Scorecard, written by David Norton, The Balanced Scorecard Collaborative, Inc. and by SEM Product Management, SAP AG, 1999

Seufert, A./von Krogh, G./Back, A. (1999a):

Towards Knowledge Networking, in: Journal of Knowledge Management, Vol. 3, No. 3, pp.180-190, 1999

Seufert, A./von Krogh, G./Back, A. (1999b):

Towards a Reference Model for Knowledge Networking, Working Paper BE HSG/ IWI3 Nr. 5/IfB Nr. 34, KnowledgeSource University of St. Gallen, 1999

Seufert, A. (1997):

Groupware-enabled Data Warehouse. Management Support für die professionelle Know-how Organisation Prüfungs- und Beratungsgesellschaft; Dissertation thesis, Wiesbaden, Gabler, 1997

Skandia (1996):

Skandia and the Intellectual Capital Development, CD-ROM, 1996

Skandia (1998):

Intellectual Capital Prototype Report, 1998

Skandia (2000):

Skandia report and information, at: <http://www.skandia.com>, 2000

Social Capital Group (2000):

Value creation: Managing and measuring the value created by KM (internal presentation),
Snyder, W./Wenger, E., Social Capital Group, 2000

Society of Management Accountants of Canada, SMAC (1998):

The management of intellectual capital: The issues and the practice. Issues paper #16, The
Society of Management Accountants of Canada, 1998

Stone, Claire Louise (1996):

Analysing business performance: counting the 'soft' issues, in: Leadership & Organization
Development Journal, Vol. 4, No.17, pp. 21-28, 1996

Strassmann, Paul A. (1996):

The value of computers, information and knowledge, <http://www.strassmann.com>, 1996

Sveiby, Karl Erik (1996):

The Intangible Assets Monitor,
<http://www2.eis.net.au/~karlerik/IntangAss/CompanyMonitor.html>, 1996

Vassiliadis, S. et al. (2000):

Competing with intellectual capital: Theoretical Background, Working Paper BE HSG/ IWI 3/
5, 2000

Vassiliadis, S./Raimann, J. (2000):

Mini-Workshop: Measure and adapt, Internal presentation, Workshop 06./07.06.00, Know-
ledgeSource St. Gallen, 2000

Von Krogh/ Venzin, M. (1996):

Anhaltender Wettbewerbsvorteil durch Wissensmanagement. In: Die Unternehmung, 49, pp. 417-436

Von Krogh, G./ Roos, J. (1996):

Managing Knowledge. Perspectives on cooperation and competition, London/Thousand Oaks/New Delhi, 1996

Von Krogh, G. ; Nonaka, I. ; Ichijo K. (1997):

Develop Knowledge Activist!; European Management Journal; Vol. 15, No.5, pp. 475-483, 1997

Von Krogh, Georg/Ichijo, Kazuo/Nonaka, Ijujiro (2000):

Enabling Knowledge Creation: How to unlock the Mystery of Tacit Knowledge and Release the Power of Innovation, New York, Oxford University Press, 2000

Wenger, Etienne (1998):

Communities of Practice. Learning as a social system, <http://www.co-i-l.com/coil/knowledge-garden/cop/lss.shtml>, June, 1998

Wenger, Etienne/Snyder, William M. (2000):

Communities of Practice: The organizational frontier, Harvard Business Review, Vol.78, Issue 1, 2000

Widmer, G. (1999):

Die Rolle von Wissensmanagement bei Diversifikationsstrategien, Diplomarbeit, Universität St. Gallen, 1999