CHAPTER 5

Developing the strategy
for knowledge management

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When companies work with knowledge management and develop a strategy for knowledge management as shown in chapter 5, the management challenges – or more precisely *knowledge* management challenges – highlight what needs to be done to the knowledge resources to strengthen them and make them work. They are also the key to enhance the company's ambition to develop use value. The translation of the knowledge narrative into management challenges demands that the company specifies what use value really is and how to act to get closer to its realisation.

The translation contains a number of creative elements, meaning that there is no specific set of management challenges, which can be highlighted as a logical or mathematical consequence of the knowledge narrative. : It is a proposition that there is a connection between the target expressed by the knowledge narrative and what one would like to do to realise it. It is a proposition that certain types of actions in concert create the desired results.

5.1 Developing the strategy for knowledge management

Some companies believe that recruiting of employees with the right specialist qualifications combined with a culture-creating initiative creates the basis for the company's future. Other companies suggest that systematic project and quality management improve the goods and services supplied and thus help fulfil the ambition to develop use value. Such connections are propositions, which cannot necessarily be completely proven to apply to the company in question. They are thus formulations of how the company is expected to be able to and should function. A company must have such formulations to be able to act as a joint unit.

The selection of management challenges is to emphasise *lasting* critical connections. It is not 'only' lifting the areas in which there may be an acute need of action not merely to disregard areas in which there is no problem at a given time. The selection of management challenges emphasises 'large' or 'basic' connections between use value and its knowledge resources. Often management challenges will concern the combination and acquisition of knowledge resources, development of existing knowledge resources as well as obtaining results through knowledge resources.

'*Maintenance of networks of competent teachers'* can e.g. be a management challenge of an institute of education where the central point is the *combination* of employee resources in the form of internal and external teachers. The management challenge '*development of cooperation with customers'* concerns which results one wants to obtain, i.e. 'what takes place' as a consequence of the company's development of its resources, employees, processes and technology.

And '*building a wide understanding of customers and their surroundings'* can be a management challenge in a consulting company within a specialised field. Here, it is important that the employees can quickly acquire the latest knowledge about the user and his/her situation. It is thus a management activity dealing with

upgrading existing employees' knowledge base about the user. This management challenge also exemplifies a distinction between internal and external knowledge resources as this management challenge is about getting access to and anchoring external knowledge resources in the company's portfolio of internal knowledge resources – in this case the employees.

The above-mentioned examples of management challenges reflect different problems as regards managing knowledge resources, acquiring and combining, upgrading and developing them. The management challenges may concern all four categories of knowledge resources – customers, employees, technologies or processes – individually and sometimes a management challenge is related to two or more categories. For example, the management challenge '*develop an inter-disciplinary cooperation'* can be seen as an upgrading of employees' interdisciplinary knowledge (employees), as the use of the company's total resources in connection with the supply of knowledge (customers) or as a challenge in relation to the company's project management or organisational combination (processes).

5.2 What do Management Challenges Consist of?

Often a company's strategy for knowledge management can be made explicit by translating the knowledge narrative into 2-5 management challenges. It may be management challenges which primarily concern individuals' competencies e.g. competencies to manage projects, it may be challenges concerned with the company's ways of working, routines, systems and methods for solving problems or it may be a combination. Below are listed a number of management challenges which are here formulated in general terms. The list is not exhaustive, but states the types of management challenges, which are often relevant. In the individual company they are defined far more precisely.

– Recruiting and retaining employees

A possible key to the development of use value is qualified employees. Thus, the company must be able to attract and retain its employees. This challenge is part of the company's knowledge management as new employees bring new specialist and sometimes organisational competencies with them. Here, knowledge is individual and attached to the individual and every employee contributes with new knowledge, not only in the shape of specialist competence, but also experiences, abilities and attitudes which must be combined with the company's existing knowledge (Nonaka 1991).

Retention of employees is an important activity for many companies and a high staff turnover is not only connected with large financial costs. It is also connected with loss of knowledge, which is not stored in the company's processes and described in documents. Thus, the retention of employees is a knowledge management challenge contributing to maintaining existing knowledge in the company.

– Competencies across employees, processes and technologies

Besides recruiting and retaining employees, the combination of employees is interesting for some companies, especially in the light of the company's technologies, processes and customers. Such a combination of a portfolio of individual resources does not only focus on the individual resource, but also on the dependence of this resource on other resources.

– Individual competence development

The employees' specialist and personal development are often connected with internal and external educational programmes, but also occur in the form of competence build-up in the job. Continuous development of employees' skills is important for relevant knowledge to be present and because they are part of the

psychological contract with the company. Sometimes, it is thus a demand placed by the employees. Such individual competence development is thus both a means to retain employees and fulfil the goal of having the right knowledge at the right time.

– Inflow of external knowledge

The build-up of knowledge and learning takes time, but the need of some types of insights changes very quickly. There are thus risks connected with the build-up of specialist knowledge why accumulating information and knowledge from external sources may be a source of upgrading knowledge resources. This may concern information from customers and users, co-operators etc.

– Creating visibility in the market

The company's visibility, identity and reputation in the market is a precondition of being able to enlarge and keep in contact with customers and users, attract qualified employees as well as obtain good cooperative relations in general. The market's perception and knowledge of the company is a fragile knowledge resource, which is difficult to control. It demands cultivation of the company's relations internally and externally to create and maintain the company's credibility.

The intellectual capital statement as a published document has a direct role as a tool to address the development of management challenges as the intellectual capital statement helps to create visibility internally and externally and communicates the company's ambitions and capabilities through a visualisation and narrative of the connection between the company's knowledge resources. The company plays a role as an expressive organisation by publishing an intellectual capital statement with its figures, text and illustrations and thus develops its competencies in connection with external relations.

– Developing a partnership with the customer

Establishment of a partnership contributes to the customer's loyalty and the company thus gets easier access to insight into the user's special situation and wants. Building a partnership relation with customers and users creates trust and care between the parties. Two factors which (cf. von Krogh *et al.* 2000) are important preconditions of knowledge transfer and creation. Developing a partnership with the customer is thus a knowledge management activity, which develops the relation between the company's customer capital and internal knowledge resources.

– Improving processes

The company's competencies are created by processes that 'bind' the resources together and it is thus exactly via processes and procedures that a collective cooperation between insight, skills and technologies is created and it is this cooperation which constitutes the company's core competencies (Hamel and Prahalad 1990). Processes are part of the company's knowledge resources and they concern a bundle of activities including many different people and technologies. Examples may be product development, process development, patenting, project management, quality assurance etc.

– Sharing knowledge – also through IT

Sharing knowledge is about disseminating employees' individual knowledge in the organisation so that knowledge becomes available where it is needed. The knowledge company's productivity and competitiveness depend on the ability to transport knowledge in the organisation and it is thus a central theme of knowledge management. It concerns e.g. the technological infrastructure on the one hand or organisational infrastructure through informal conversations and

personal meetings where room – of physical, mental or virtual character – for knowledge sharing is created (von Krogh *et al*. 2000).

The management challenges thus state some durable and critical key problems, which need to be addressed to realise the knowledge narrative. This involves strategic choices concerning combination of knowledge resources, upgrading of knowledge resources, surveillance of results of the company's development as well as translating the knowledge narrative into managerial topics. The management challenges lead the way to which initiatives and indicators a company should choose to implement and follow up on the company's development of knowledge resources, i.e. which knowledge management the company should practice.

5.3 Knowledge Management Initiatives

As shown in chapter 3, the third element in the company's knowledge management strategy is the specific initiatives that constitute the practicalities of knowledge management. A company needs to identify initiatives which make it possible to follow the ambition of the company's knowledge management strategy or more precisely the management challenges brought up by the knowledge management strategy.

However, as it is not exactly given beforehand how such measures may be defined, the propositions that connect the various efforts are often whole networks of related elements which may gain weight through incorporation of staff, customers, processes and technologies. Completion of the initiatives is made visible by means of *indicators*, which are typically connected to the individual initiative.

Both initiatives and indicators are part of an analysis. They are suggestions for how the company may realise its knowledge management. The identification of such suggestions is often the result of cross-organisational work, which takes a

point of departure in specifying and visualising activities *already* found in the company, which then may be strengthened by relating them more forcefully.

Knowledge management concerns initiatives to build up, anchor and evaluate the use of the company's knowledge resources. These initiatives can refer to the management challenges and make it possible to explain why these are taken. The choice of initiatives is also is a process , which can take its point of departure in an established knowledge of how the company works which may mean that two otherwise similar companies may justify their knowledge resources differently. When set up, this view of the firm, however, may need to be looked at critically, and the combination of efforts and activities may be inadequate. This is important when the combination of efforts and initiatives is re-evaluated.

There may be several types of initiatives which all contribute to influencing knowledge sharing and development as well as anchoring and disseminating knowledge. The examples below show a number of different possibilities.

Employee development: internal and external educational activities, on-the-job training, learning from one's neighbour, mentor arrangement and recruiting.

IT: electronic library, list of knowledge resources/electronic CV and virtual competence centres.

Organisation: project groups, physical competence centres and seminar activities.

Supervision and planning systems: quality management systems and project management systems.

Physical resources: different rooms for different activities – open-plan offices, quiet rooms, project rooms, social rooms and creative rooms.

Incentives: financial and symbolic encouragement for knowledge sharing employees.

Customers: project development customers and image developing customers.

Process and product development: investments and patents.

Many of these initiatives will often appear together and they are often substitutes of or complements to each other. Therefore, the list is not a specification of an ideal situation. Only few companies will perceive all as initiatives, not least because there are limits to how much a company can be occupied with at the same time.

Several initiatives will concern something that in one or the other way already has been initiated in the company. However, by making them visible and emphasising them, they get a whole new meaning and by combining them in a new way and relating them to an overall knowledge management strategy, they may even create new energy.

Initiatives are thus neither exotic, nor are they all completely new. Some take their point of departure in the company's existing day-to-day work, but by bringing them up, they become objects to reflection and may get new importance. Other initiatives may be completely new and unknown before the work with knowledge management is initiated. It is probably more important that they are anchored and feasible than that they are completely new as they get a new communication content by being connected with other initiatives and by being related to the management challenges.

The individual management challenge can be supported by activities, which straddle the above-mentioned list. The management challenge *'inter-disciplinary cooperation'* may e.g. be an essential management challenge to some consultancy companies as it is important to carry through projects that give the customer a total, functional package solution. However, there are many ways in which 'inter-disciplinary cooperation' can be established. It could e.g. express the composition of project groups so that employees with different educations and from different departments work together and are seated in the same room. It could also mean that the employees meet and speak with each other at given

intervals. Or it could mean that managers meet to coordinate the activity while the individual employee works steadily on his/her little part of the project. Therefore, there can also be a number of possible initiatives to make 'inter-disciplinary cooperation' work. It does not mean that 'inter-disciplinary co-operation' is the same in the three situations. It only illustrates that there are different translations of the management challenge for the company's practice. Thus, the choice of initiatives is part of the company's formulation of the most essential relations, which shall make the knowledge management strategy work.

5.3.1 Examples of Initiatives: Inter-disciplinary Co-operation

Initiatives help specify what knowledge management is about as they are precise specifications of how knowledge management is practised. If we take the specific management challenge 'inter-disciplinary cooperation' as an example, knowledge management may in various settings be concerned with the following initiatives:

- *Virtual competence centres:* To promote development and sharing of competencies across departments and projects, more companies have established *virtual competence centres,* i.e. inter-disciplinary meeting spaces centred round certain competencies with a view to sharing knowledge and experiences. Similarly, other companies have appointed *knowledge agents, process agents* etc. who coordinate competencies across the organisation.

- *Project organisation:* Organisation of the company's activities through projects is well-known. Here, the company's different types of core competencies, which are organised in the department structure, are combined with special customer requirements and wants. Here, knowledge management takes place through the combination of resources.

– *Customer-oriented organisation:* If the project working method does not give adequate efficient coordination of competencies in relation to the individual customer relation, some companies choose to make individual persons responsible for the customer relation. Thus, more focus is directed towards the customer's situation and the responsibility for the inter-disciplinary competencies is moved away from the specific departments. There may e.g. be key account managers etc.

– *Project management education:* Initiatives concerning project management education may be a lever for the development of inter-disciplinary cooperation as they strengthen project work and thus strengthen the combination of different competencies.

– *Information about new projects on joint meetings:* Information about new projects on joint meetings across departments which e.g. reflect customer type or employee competencies make possible that employees with relevant interests and competencies can participate in projects which are anchored in other departments.

– *Competence profiles:* Many companies develop surveys of their employees' special competencies and experiences with different types of projects, customers etc. to show who has which knowledge. Such surveys are often named competence profiles, electronic CV's etc. and they make it possible to man tasks with inter-disciplinary dimensions.

– *Standardised working methods:* By introducing standardised working methods in projects e.g. by preparing a project manual etc., some organisations have made it easier to establish cooperation across departments.

– *Project intranet:* in some companies, electronic meeting rooms, so-called project webs or project intranet, support the inter-disciplinary work. This

sort of initiatives may also comprise joint access to network pinions, e-mail lists etc. and will, in the most extended version, be a specific intranet.

– *Project descriptions:* To ensure knowledge about the projects at the time of establishment, some companies state on the intranet whether projects are under establishment – either by way of a short description or by making the whole project description available. However, such an initiative can be just as useful after the projects have been concluded since information about the projects' content and manning may create the basis for establishment of future projects.

It is characteristic that most of these initiatives to support the management challenge 'inter-disciplinary cooperation' are well-known working methods, organisational principles, tools etc. Some initiatives will supplement and support each other such as it may be the case with a project management education and the use of standardised working methods, whereas other initiatives are different ways of solving the same task. If the problem is to bring together experiences and competencies in a project, this may be done by using competence profiles and on the basis of descriptions of projects already carried through.

Initiatives are, on the one hand, concerned with the four types of resources: employees, customers, processes and technology. In the example above, most of the possible initiatives concerning 'inter-disciplinary' project work' concern processes: Virtual competence centres, standardised working methods, joint meetings etc. These initiatives are taken to improve working methods and processes. However, processes can also be improved by carrying through initiatives concerning technology (intranet), employees (project management education) or customers (customer-oriented organisation, key account managers).

Initiatives taken in the light of knowledge management are not a narrow consequence of a logical translation of the management challenges. They are creative interpretations of what may be associated with a management challenge and thus they are part of the special idea about how things are connected and affect each other in the company. Thus, there is an identification of relevant connections in these translations. They do not interpret themselves. If indicators are attached to initiatives, they may contribute to proving if these connections are realised, but they cannot narrowly prove that one has found the 'correct' connections. Connections are outside the figures.

5.4 Knowledge Management Indicators

The fourth element of the company's knowledge management strategy is the indicators in the intellectual capital statement. Indicators are the figures of the intellectual capital statement and contribute to making the intellectual capital statement a tool to be used for on-going follow-up and evaluation.

Indicators have three functions in relation to the knowledge management strategy and the intellectual capital statement. Firstly, they serve to specify both management challenges and initiatives. Secondly, they facilitate assessment of initiation, completion and effects of initiatives and management challenges. And finally, they are a link to the reporting part as the indicators reported by the company in the external intellectual capital statement are chosen from this.

The first purpose, specification, is the most important one. When selecting indicators, the company is forced to be very specific. Here, the company has to make a decision on whether it can find indicators that follow up on the management challenges and the initiatives. A management challenge may e.g. be formulated as 'recruiting and retaining employees'. However, it is still general and does not get content until initiatives and indicators have been defined. The initiatives tell whether it especially concerns recruitment or retainment and they

tell who needs to be recruited and who needs to be retained. Not until this specification has been made is it possible to identify relevant indicators that follow up on the initiative. A challenge for many software companies is e.g. to recruit and retain highly-educated software developers and the number of company presentations at computer science studies is thus an indicator specifying the initiative.

The other purpose of the analytical specification of indicators is to make possible an assessment of the commencement, completion and effect of initiatives. This follows immediately from the above specification as measurements of initiatives like employee retirement interviews, mentor arrangements and introduction programmes will be able to show if the initiatives are taken, completed and, finally, if they have the desired effects. Thus, the company's knowledge management is put into figures and thereby the company is also able to report about it. Through the figures, knowledge management is visualised and it is made possible to evaluate whether it is going forward or backward or whether it is improving or deteriorating. Through the figures, systematic knowledge management is made possible.

The third purpose of the specification of indicators is that they are the basis of reporting in the intellectual capital statement. Through specific figures, the intellectual capital statement is added seriousness as the company is able to document its initiatives to create use value and at the same time whether it is able to create use value, i.e. how far the company is from fulfilling its ambition.

There is great variation in the indicators, which can be used in the company's knowledge management strategy and in the intellectual capital statement. One characteristic is that one indicator can seldom describe a management challenge or initiative, but a wide range of different indicators is often a necessity to form a clear picture. 'Product development' can e.g. typically not be described by one *figure* like e.g. investments in R&D. Recruitment of development people and

researchers, number of new patents, new products' share of the turnover and number of focus groups with customers and users may also belong to the overall picture.

Most indicators are surprisingly simple and a large part of them are basically already found in the company's different administrative systems. It also shows that surprisingly enough a large part of them are probably not non-financial, however, they are more concerned with expenses for different activities and income which is segmented in different ways. Thus, there is no limit to what an indicator is just as there are no rules as to how many indicators are needed.

5.5 Example: Systematic Software Engineering

Systematic Software Engineering (Systematic) is a Danish software house that develops and sells technical system solutions, products and support primarily to ministries of defence but also increasingly to industry, as well as transport and service companies. The company has since 1998 been working with intellectual capital and knowledge management and reports in the most recent intellectual capital report according to the model shown in Figure 5.1

Figure 5.1 The intellectual Capital Report Model (Source: Intellectual Capital report 2004, Systematic Software Engineering).
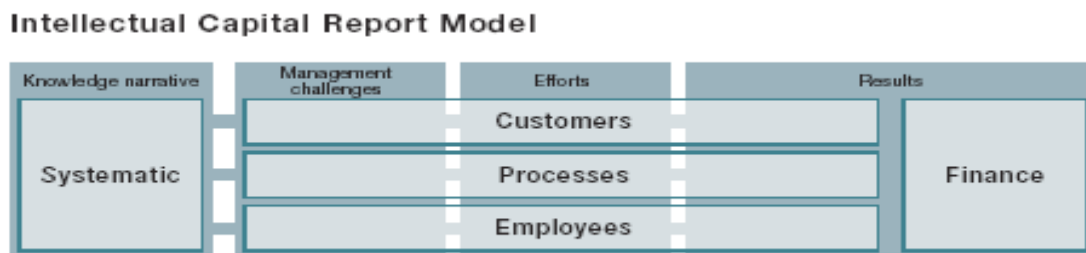
Systematic was founded in 1985 and has especially in the last four years grown rapidly from 130 employees in 1999 to about 350 in 2003 including the subsidiaries in the UK and USA. In 2002/2003 the annual sales amounted to 32

million euro with return-on-sales about 10%. The export share, which was 60% in 2003, is expected to increase in the coming years

It is the stated aim of Systematic to develop its core business areas from primarily being a supplier of defence systems to increasingly becoming a supplier also to civilian markets. In recent years there has in fact been an increase in the proportion of civil contracts with Electronic Patient Journals and electronic trade and security systems being the core business areas. However, Systematic has also been very successful in gaining large orders in the defence segment, which is likely to be a major growth driver in the coming years.

6.5.1 Initiating knowledge management

The first steps towards publishing an intellectual capital statement was taken in 1998 at the same time as efforts were also made towards process improvements in software development. As a major achievement the company was in 2002 certified at level 3 according to the Capability Maturity Model (CMM) – an American model developed to systematically improve software development processes; see further details in Figure 5.2. In April 2004 Systematic was certified to level 4, which means that the company is in the absolute European elite since only 10 European companies meet such documented quality and maturity standards. It is the stated aim to obtain the level 5 certification in 2005 which no European companies has yet achieved.

Systematic intellectual capital report is concerned with management's efforts to influence the structure of the firm's knowledge resources. It is not about the value in monetary terms of the firm's intellectual capital, but more about its management's efforts to develop knowledge resources. Systematic's management sees the intellectual capital statement as an alternative to the traditional annual report, and most symbolically at the end of the intellectual capital statement, the reader will find a two-page version of the annual financial statement. In this way the financial statement is presented as a supplement to the

intellectual capital statement, and compared with the financial statement, the intellectual capital statement is a colourful and an expressive form of communication.

Figure 5.2 The capability Maturity Model Integration (Source: Intellectual Capital report 2004, Systematic Software Engineering).

Result	The Capability Maturity Model Integration (CMMI)		Effort
The processes are continually improved based on return-on-investment considerations. Process improvement has become a natural, daily activity in which most employees actively participate. The organisation optimises its ability to deliver software products and systems better, faster and cheaper. Systematic learning and innovation are generated from own experience and that of the surroundings.	Continuous Improvement	5 Optimized	• Causal Analysis and Correction • Organizational Innovation and Deployment
Projects are managed on the basis of quantitative measurements covering all project objectives related to customer, employee and corporate needs. Statistical methods to control product quality and processes are implemented, including organisational processes such as training. Models are used to predict the development of central control parameters in order to take preventive actions and to update plans.	Reduced Variation	4 Quantitatively Managed	• Quantitative Project Management • Organizational Process Performance
A standard set of processes is defined and tailored to each project's needs. Engineering processes are more effectively implemented. Quantitative measurements are used to monitor project progress, and organisational process improvement is currently implemented. Employee training needs are identified, and relevant training activities are carried out.	Common Foundation	3 Defined	• Technical Solution • Verification • Validation • Risk Management • Product Integration • Requirements Development • Integrated Project Management • Decision Analysis and Resolution • Organizational Process Focus • Organizational Process Definition • Organizational Training
Processes are planned and executed in accordance with policy and procedures. Focus is on disciplined project management, and plans are produced and monitored. Tools are deployed to control quality and engineering. Employees are trained to undertake different functions. Successful projects can be repeated even if there have been some employee replacements.	Stabilization	2 Managed	• Requirements Management • Project Monitoring and Control • Project Planning • Measurement and Analysis • Supplier Agreement Management • Process and Product Quality Assurance • Configuration Management
Processes are unpredictable, ad hoc and often chaotic. Performance is difficult to predict. The projects depend on 'heroes'. High quality relies on assigning the best people. Schedule and budget are usually overrun. Much time is spent on fire-fighting.	Project Management	1 Initial	→ Goals → Means

Systematic wants to be amongst the best in its fields of operation. This puts increased emphasis on continuous improvements and innovation, which must be achieved without losing sight of the day-to-day business. As an example of the projects carried out by this firm, Systematic was in March 2002 awarded a contract for more than € 16m for the delivery of a Mission Planning System that will form an essential part of the future NATO-wide Air Command and Control System (ACCS). The order was received after more than four years of sales effort. The firm explicitly state that one of the reasons that they won the contract

was due to their extensive capability in knowledge management. This achievement emphasises the need to maintain focus on knowledge management.

Another large order was a reality two years later when Systematic signed a contract to develop communication and maintenance software for the world's most advanced multi-role fighter. Here Systematic is going to provide external-communication message processing software, a Portable Maintenance Aid to be used for fighter service and maintenance.

5.5.2 The intellectual capital report

Following the Danish guideline for intellectual capital reporting, Systematic identifies three managerial challenges within knowledge management:

- Partnership with customers
- Software process improvement
- Employee care and competence development

With software process improvement being the connecting thread. The three management challenges are described in substantial details in the intellectual capital report, but as an illustration only the first, i.e. "Partnerships with customers", will be mentioned here because it accentuates how most of the Danish intellectual capital reports are designed with the creation of use value in focus.

User requirements are within software engineering seldom adequately defined to be used for the system requirement specification, which is the foundation for the system architecture, design, coding and test activities. Systematic have adopted a number of procedures, techniques and ways-of-working in order to manage the critical interface between the firm and the users of the solutions provided by the firms, i.e. the user oriented knowledge management activities.

Systematic has e.g. chosen to employ a number of (non-software engineering) specialists who have many years of experience in the fields of defence and

healthcare. These employees contribute to the project teams by providing expertise that can bridge the gap between the customer/end-users and the systems engineers. Furthermore, they provide motivation to both parties in the process of creating an effective solution. Customers – and preferably end users as well – are actively involved throughout the development process at human computer interaction workshops, development of prototypes, planning of test scenarios and in project and steering group meetings etc.

Further, in order to increase the engineers' understanding of customer and end user environments, Systematic have implemented a project to 'Meet the Customer'. The objective is that 75% of all employees meet and preferably visit a relevant customer or end-user at least once in a two-year period, e.g. spending a day in a hospital ward, at an operational command unit etc. Employees from Systematic regularly also participate in national and international conferences and seminars where trends and new opportunities can be observed.

Focus on Customer Satisfaction Customer satisfaction is, like in many other firms, also seen as vital ability to create value for the customers and, as a result, generate new sales opportunities. Every second year, Systematic carry out a survey of customers' satisfaction with its project and consulting assignments. The survey is conducted by independent consultants in the form of interviews with key customer contacts.

Today, Systematic has published four intellectual capital statements. These reports illuminates through indicators as well as corresponding text and illustrations certain aspects of customer-relations, employee development and customer- and employee-satisfaction, the effectiveness of processes, and certain form of innovation in areas of product development and process improvement.

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