Knowledge management in small and medium-sized companies: knowledge management for entrepreneurs


Abstract:

This article deals with a field which gets little or no attention in the research done into knowledge management: small and medium-sized enterprises (SME). First a conceptual model for SMEs will be given, next this model will be used to analyze various companies. It is found that knowledge management appears in SMES to get its form especially at an operational level.

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Introduction[1]

Changes in society: pluralisation and individualisation

Society has changed drastically over the last few years. But this is nothing new, or so it appears. Societies are always changing, just as people are always changing. And seeing as it is the people who form the societies, a constantly changing society is only natural. However something more seems to have happened over the last few years. Without wanting to frighten off the reader straight away, we can point to a diversity of social developments that indicate that the changes seem to be following each other faster, especially over the last few decades. We can for instance, point to the pluralisation (or a growing versatility), differentialisation and specialisation of society as a whole. On a more personal note, we see the diversification of communities, an emphasis on emancipation, individualisation and post-materialism and an increasing wish to live one's life as one wishes, free from social, religious or ideological contexts.

Changes in the economy: the knowledge economy
If we take a more economic focus, we see for example individualisation, immaterialisation, initiation and ageing in consumer markets, whereby the markets in their turn are increasingly steered by a capricious consumer. Besides this, we see trends such as flexibilisation, deregulation, professionalisation, specialisation and an increasing mobility on employment markets. We also see developments such as the increasing interest for individual entrepreneurship, network formation, computerisation and internationalisation within economic contexts. Altogether, the western economy has evolved into a knowledge economy in which the technological and scientific developments follow each other in a rapid tempo and in which things such as information and communications technology, networks, international competition and knowledge intensive products such as services, play a dominant role.

Consequences for company life: changing requirements

These types of trends manifest themselves in company life for instance in increasingly capricious and diverse consumer preferences, more demanding consumers, an increasing interest for things such as status, reputation, brand names, logos, product design, user-friendliness, and after sales, an increasing interest in service providing for products and the shortening of the life span of products and services[2]. It has mainly to do with a strongly changing requirement for which the emphasis has shifted to the skill, the quality and the image that is used for the products or services.

Complexity as common denominator

In general, one can say that this sort of development - and with the sketched developments, the summary of current trends is by no means exhausted - makes society all the more complex. And if society becomes more complex, then the business environment of the average entrepreneur also becomes more complex. He must deal with these developments and will have to make better and smarter use of his or her technological, organisational and marketing competencies in order to stay ahead of all these complexities.

Knowledge as competing factor

An important means to reduce these complexities is using knowledge. Knowledge is the factor with which entrepreneurs can distinguish themselves from their competitors. Apart from this, knowledge is the means with which the poorly organised business environment can become well organised, with which the complex world becomes manageable and with which unclear items can be interpreted.

Phrasing

The goal of this article is to make the increasingly important field of knowledge management accessible to researchers in knowledge management and entrepreneurship and to the entrepreneurs themselves. After a short introduction of the background and definition of knowledge management, a short explanation will be given of various methods with which entrepreneurs can optimise the use of their knowledge. The following questions will be addressed:

- What is knowledge and knowledge management?
- How do (innovative) entrepreneurs use knowledge?
- What are systems to organise knowledge?
Set-up of this article

These three questions will be handled as follows: in the section headed "theoretical notions", we will go into some theoretical notions about knowledge and knowledge management. Important concepts will be defined and a conceptual knowledge management model will be presented. In other words, an answer will be given to the question: "what is knowledge and what is knowledge management?". Subsequently, in the section headed "empirical results", a report will be made of the study that was done of 12 innovative businesses from the industrial and business service providing sectors, with which an image can be formed of the extent in which knowledge management has gained a place in small and medium-sized companies. In the section headed "empirical results", the answer is given to the question: "how do (innovative) entrepreneurs use knowledge?". In the conclusion the most important theoretical and empirical findings are briefly summarised.

Knowledge management in SMEs: theoretical notions

What is knowledge?

Definition of knowledge

The most important question with regard to knowledge management is obviously: what is knowledge? It is good - before we answer this question - to look at what knowledge is not. Knowledge can certainly not be assumed to be equal to a dose of data. Above all, knowledge cannot be considered equal to information. Knowledge can primarily be described as something that makes both data and information manageable. A comparison might help you here. You want to travel by train from Rotterdam to Amsterdam. What you need here is data, some information but above all, knowledge. You are provided with the data through tables with train times at Rotterdam station. From these data you can extract meaningful and useable information from the large amount of data that are relevant for your trip. The thing that makes this all possible is knowledge. You have knowledge of train tables, you know approximately what all the little numbers on the large yellow signs mean. You know, above all, that you must consult the tables if you want to know what time the train leaves. And you can read. You found the station. Even more important: you want to take the train. These are all things that have to do with knowledge. In short we can say that knowledge is characterised by information, a capacity and an attitude. With regard to the optimum use of knowledge, it is important that all three of these factors are given equal and sufficient attention. This is emphasised in Figure 1. Looked at in this way, knowledge is the result of a multitude of factors: experience, skills, culture, character, personality, feelings, etc.

Information

Knowledge is an amount of information that is necessary to function and achieve. What this information is, is difficult to say in advance. It is however important that this information is easily accessible within the organisation and accessible for everyone.

Capacity

Knowledge is - besides information - the capacity to make information from data and to transform it into useful and meaningful information. It is the capacity with which one thinks creatively, interprets and acts. With regard to knowledge in business, one could think of tapping into and developing that at which people are good, including what are called their core skills or core competencies.

Attitude
Above all, knowledge is an attitude. It is attitude that makes people want to think, interpret and act. Within organisations it is, with regard to the factor attitude, important for example to stimulate people's curiosity and inclination to innovate. One speaks these days in this case of internal entrepreneurship or intrapreneurship.

Explicit and implicit knowledge

With regard to knowledge management, we must, therefore, take into consideration the more system-bound side of knowledge (information) and the more people-bound side of knowledge (capacity and attitude). The system-bound side of knowledge is also called explicit knowledge, whilst the people-bound side is called implicit knowledge. From a study of the success of Japanese entrepreneurs, it has become apparent that their success is mainly due to their ability to transform implicit knowledge into explicit knowledge whereby, for instance, it is attempted to grasp people's creative ideas (implicit knowledge) as information and knowledge systems (explicit knowledge), so that they become reproducible and useable[3]. Explicit knowledge is characterised, according to various researchers, by its ability to be expressed as a word or number, in the form of hard data, scientific formulas, manuals, computer files, documents, patents and standardised procedures or universal starting points that can easily be transferred and spread. Implicit knowledge, on the other hand, is mainly people-bound and difficult to formalise and therefore difficult to transfer or spread. It is mainly located in people's hearts and heads. Altogether, knowledge is a stubborn, relative, chaotic and especially to a large degree context-bound factor, that is extremely difficult to organise due to these characteristics.

What is organising?

Definition of organising and organisation

In the simplest form, we can describe organising as the achievement of certain - mostly pre-determined - goals using certain means. Goals of organising can be: making profit, optimising turnover, creating as much employment as possible, but also obtaining as much knowledge as possible, starting collective optimal learning processes or just enjoying your work. An organisation is, therefore, nothing more than a collection of people who have (voluntarily) come together to mutually achieve these goals.

Organisation means

There are four crucial means with which one can organise: strategy, structure, culture and systems[4]. An optimal mix of these four elements can ensure an optimal management process. This can be seen in Figure 2.

The four elements can be described as follows:

(1) Strategy: strategy expresses in what direction the company will be going in the future. Based on market research, competition analysis and self-analysis, the crucial differentiating competencies or strong sides of the company are identified and formulated. Based on this, the co-ordinating mission and the near future goals are determined.

(2) Structure: the structure of an organisation is what follows from a division of the work, the tasks and the responsibilities, both horizontally and vertically. It is the total of the various ways in which the work is divided into separate tasks and the way in which these tasks are then co-ordinated.

(3) Culture: the culture of an organisation can be characterised as the whole of the values, norms and views shared by the people who make up the organisation. The culture of an organisation is
expressed as symbols, rituals, myths, stories, anecdotes, legends, so-called heroes, as well as being in a mutual language that these people create amongst themselves. Together with the structure, the culture forms the tactical part of the organisation.

(4) Systems: the systems can be defined as the rules, procedures, guidelines and instruments with which the daily functioning of people in the organisation is facilitated. In this article we lay the focus of knowledge management specifically on the systems, as they are often central in small and medium-sized companies. There are seldom extensive or crystallised strategies in these companies, or a well thought-out organisation structure. Obviously, there is a certain culture present. However, as the culture is one of the most difficult factors to influence in an organisation, the focus again comes back to systems. We will come back to this later. The systems form the operational part of the organisation.

What is knowledge management?

Definition of knowledge management

If we look at the definitions that we have given for organising and knowledge, knowledge management is the management of information within an organisation by steering the strategy, structure, culture and systems and the capacities and attitudes of people with regard to their knowledge:

- the strategy in this case serves to determine the goals with regard to the factor knowledge on the short and medium term;

- the structure is there to facilitate people to make their knowledge - their information, their capacities and their attitude - productive;

- the culture is primarily targeted at the motivation of people to make their knowledge productive and to actually use the systems offered;

- the systems are targeted at the management of the operational instruments that is targeted at making the information, the capacities and the attitude within the organisation, productive. As has already been stated, this element is central to managing the factor knowledge in small and medium-sized companies.

Knowledge management can be defined in other words as the achievement of the organisation’s goals by making the factor knowledge productive. This is done primarily by facilitating and motivating people to tap into and develop their capacities (their core competencies) and to stimulate their attitude to intrapreneurship. Besides this, knowledge management includes the entirety of systems with which the information within an organisation can be managed and opened up.

Knowledge domains: organisation, marketing and technology

Obviously it is important to examine what knowledge can relate to in an organisation. In principle, one should have knowledge of everything, but from a viewpoint of an analysis of the organisation, it is expedient to define a number of so-called knowledge domains in which the entrepreneur can target himself in particular. Three knowledge domains are defined here: organisation, marketing and technology[5].

Knowledge with regard to the organisation has to do with things such as management, policy, culture, personnel, career planning, internal processes, cut backs, alliances and teamwork. When
thinking of marketing knowledge, one should think of things such as competition, suppliers, customers, markets, target groups, consumers, clients, users, interested parties, sales, after sales, trade and distribution and relation management. When thinking of technological knowledge, one should finally think of knowledge of products, research and development, core competencies, technological development, information and communications technology, product development and assembly.

Nine knowledge streams in knowledge management

There are nine possible knowledge streams within the organisation that are important for the management or the entrepreneur to think about in order to structurally manage these processes[6]. The four means mentioned that are used to organise are targeted at these knowledge streams in knowledge management. The nine knowledge streams are mentioned here. A number of examples of systems that can be used and are especially important within the small and medium-sized companies are named for each stream. Above all, it is stated which of the three other organisation means generally play a dominant role within the knowledge stream concerned:

(1) Determine the knowledge necessary: before the knowledge stream can be started, it is important that you look at what knowledge is necessary for the organisation and its goals. This is mainly a strategically driven activity. Necessary knowledge can be, for instance, determined by means of brainstorm sessions, by the development of scenarios or by interviewing clients, suppliers or colleagues.

(2) Determine the knowledge available: besides determining the necessary knowledge, it is obviously important that you look at what knowledge is already available in the organisation. Here again, strategic drive in the organisation plays a major role. The knowledge available can be determined, for instance, by baring successful acquisitions or projects (also called best practices), by maintaining a CV file of the personnel or by organising experience swapping sessions.

(3) Determine the knowledge gap: the difference between the necessary and available knowledge is called the knowledge gap. It is important, in the frame of knowledge management, to have a good insight into this knowledge gap in order to close it in the correct places. Obviously this activity is also strongly strategically driven. The determination of the knowledge gap can be achieved with the systems that were mentioned under points 1 and 2.

(4) Knowledge development: based on the difference between the necessary and available knowledge, it can be determined to develop the knowledge yourself. This is a knowledge stream that will get its form especially via the structure of the organisation. Developing knowledge yourself can be done via research and development, through education and training or by means of customer satisfaction studies.

(5) Knowledge acquisition: if developing the knowledge yourself is not possible, one can decide to acquire knowledge. One can primarily use the structure of the organisation for this purpose. This is possible, for instance, by employing specifically qualified personnel, by purchasing licenses or patents or by purchasing market research or strategic reconnaissance.

(6) Knowledge lock: under knowledge lock we understand that the purchased or developed knowledge is changed into structural and systematic form and that this is ensured, whereby the knowledge is determined and is available to everyone. This can be done by means of the structure of the organisation. Examples of what knowledge one can lock are requesting patents, maintaining project files or installing an intranet.
Knowledge sharing: a crucial aspect within knowledge management is sharing the available (and locked) knowledge between employees mutually, between employees and managers, between departments, etc. It is important that the correct knowledge gets to the right person at the right time. Knowledge sharing is primarily a knowledge stream that is dependent on the culture of the organisation. One can share knowledge by making project or fact sheets, job rotation, internal secondment and lunchtime meetings.

Knowledge utilisation: it should be clear that the actual utilisation of the knowledge forms a central element within the knowledge management process. It is difficult to name examples of knowledge management systems that are specially targeted at the utilisation of knowledge. It is clear that the utilisation of knowledge is also a knowledge stream that rests largely on the company culture. The utilisation of knowledge should chiefly be stimulated and motivated by the management.

Evaluate (utilised) knowledge: obviously the (utilised) knowledge should be evaluated within the organisation. The evaluation of the (utilised) knowledge should then again be used as input for the determination of available and necessary knowledge. This knowledge stream is largely strategically driven. Evaluation of knowledge can be done, for instance, through project evaluations, internal and external audits, executing customer satisfaction studies or benchmarking.

The process of knowledge evaluation forms on its own - as was stated in point 9 - a logical input for the determination of the available knowledge and the necessary knowledge and the knowledge gap that is based on this. The knowledge stream therefore becomes a knowledge cycle that is directional for the knowledge management process. The knowledge cycle then looks like Figure 3.

Ideally, according to the knowledge cycle within the organisation, one first looks from a strategically driven viewpoint to determine what the necessary knowledge is, then one looks to see what knowledge is available and based on this, the knowledge gap is determined. One closes this gap by developing knowledge and, if that is not possible, by acquiring knowledge, after which the developed and acquired knowledge are locked within the organisation. These three processes are mainly linked to the structure and the systems. The knowledge is then shared and utilised; processes that are largely dependent on the company culture. Finally, the (utilised) knowledge is evaluated - often with a certain strategic vision - with which the process can be started again from the beginning. Certain systems are connected to each of the nine processes. Obviously such a process usually does not work in practice as it is described on paper. Many of these processes are occurring constantly and it is then absurd to postpone the sharing of knowledge as long as one is still determining what knowledge is necessary. The above scheme does, however, offer something to hold onto if one wishes to structurally monitor the important processes.

An integral conceptual knowledge management model

A model with conceptual purposes

Based on the elements discussed in this section that play a role in knowledge management, an integral knowledge management model can be constructed. This model is mainly of a conceptual nature and should be used to give the important factors within knowledge management a place. This is all the more important as the four organisation means mentioned in the latter section will be used to analyse the cases in this study. The conceptual model can be found in Figure 4.

Short explanation of the conceptual model and the knowledge management process
As you can see, making the factor knowledge productive - this is information, capacity and attitude and has to do with the organisation, marketing and technology - forms the core and the primary goal of the knowledge management process. In order to make the knowledge that is available within the organisation, or that should be present within the organisation, productive one can use the four organisation means. The primary focus here - due to the emphasis on the small and medium-sized company - is the utilisation of all sorts of systems. These systems make reflection possible in a "knowledge management friendly" environment. They are flexible, can be adjusted if needs be to suit changing situations and act as a signalling device with regard to new situations. The use of these systems can be facilitated, stimulated and motivated by the utilisation of the other three organisation means: strategy, structure and culture:

- The strategy is mainly important for the evaluation of knowledge, the determination of necessary and available knowledge and the determination of the knowledge gap. In an organisation where one wishes to make the factor knowledge as productive as possible, one thinks systematically about it. It should be clear that the other two organisation means play a role too, however the primary organisation mean remains strategy. A strategy that is optimally tailored to make the stubborn and capricious factor knowledge productive, is ideally not determined in the long term so that a flexible approach to changing situations is still possible. Various focuses are also managed. The strategy is formed above all pro-active and intuitively. The employees, or at least the managers, are aware of the core competencies in the area of knowledge and also know how to exploit them. Finally, the emphasis lies in the formulation of the knowledge intensive company strategies on the customer.

- A facilitating structure is mainly important for the development, the acquisition and the locking of knowledge, and this structure is (also) targeted at this. Here, the two other means - strategy and culture - play a role but the emphasis is on the organisational structure. A structure that is facilitating with regard to the factor knowledge is generally flexible, flat and decentralised. Project teams are organised in suchlike structures around product-market combinations. It is also possible that the entire organisation is organised on a project basis, whereby various employees work together with different colleagues at different times. Line and staff are mixed in such organisations and co-ordination takes place through consultation.

- Finally a motivating company culture is especially important for the sharing and utilisation of knowledge. This company culture is tailored to it. Just as with the strategy and structure, the other two organisation means play a role here but the emphasis is on the culture. A company culture in which the production factor knowledge can come to its optimum advantage lays its focus on the stimulation and exploitation of the creativity of its employees. The culture is informal and orientated on problems, tasks and results. Above all, the culture is characterised by openness, flexibility and an inclination for - or at least not a fear of - taking risks. Making mistakes in such an organisation is seen as an investment in a person's learning process. Learning is therefore seen as very important.

It should be emphasised that the reality is obviously not as composed as is suggested on paper. The conceptual model only gives guidelines for important items with regard to knowledge management, where making the factor knowledge productive is the final goal, whereby information is managed and opened up, whereby the core competencies of employees are tapped into and developed and whereby the intrapreneurship of people is stimulated.

Knowledge management in SMEs: empirical results

The cases studied

Selection of the companies
In the study on which the data in this section are based, 12 companies were studied. The companies were selected via a telephone selection round during which the following questions were asked:

1. Have you ever heard of knowledge management?

2. Would you say that knowledge is one of your most important competitive factors?

3. Do you ever determine what knowledge your company needs in order to realise your company strategy?

4. Do you ever determine what knowledge is present in your company and in the heads of your employees?

5. Have you ever been occupied with the external acquisition of knowledge for your company processes?

6. Do you occupy yourself with developing knowledge with regard to your company processes?

The companies that answered questions 3 through 6 by saying that they do this periodically and systematically, were invited to be questioned at length by an EIM-researcher on the subject of knowledge management. The 12 companies visited are, in other words, generally acquainted with knowledge management (only one of the interviewees had never heard of the term) and they are companies who see knowledge as one of their most important competitive factors. Furthermore, the companies make a periodical determination of the available and necessary knowledge. Above all, they are companies who are periodically busy with the external acquisition and self-development of knowledge for their company processes.

Description of the companies

Half of the companies visited came from the sector of business service providers and the other half came from industry. Of the 12 companies, ten can be classed as small or medium-sized. Of those ten, six had less than 25 employees. The smallest company only had three employees. Three companies had around 100 employees and one company had 75 employees. The two large companies had respectively 140 and 550 employees. The interviewees all had a managerial position. Of them, five were managing directors and two were assistant managers. There were also five managers. All the companies can be characterised as innovative.

Investigation results

Strategy

By the analysis of the knowledge intensive strategy, a number of items are shown to be of importance. We have chosen three of these items here. A strategy that fits well with a company that is adjusted to knowledge management is not completely determined, in other words various areas of attention are formulated. It is also important that the strategy is targeted at the market and at the customers. Above all management is aware of the core business or the company’s niche market. In general, it can be said that none of the 12 companies has formulated an explicit policy with regard to knowledge management. In general we cannot speak of a clear knowledge strategy based on which systematic knowledge can be evaluated and based on which the knowledge gap between available and necessary knowledge can be determined. It was apparent that the strategy of some companies - consciously or subconsciously - satisfies a strategy grafted on knowledge management.
The formulation of areas of attention

Of the 12 companies studied, there are three who consciously formulate various areas of attention. Here, no differences can be seen in various sizes of companies or the sector in which they are active.

Illustrative in this context is company A who has eight employees. The company is considerably innovative and does much research and development in the area of biotechnology. The company sells knowledge and has set themselves a goal to provide this knowledge in a communicative and low-threshold fashion. A company manager explains why they have not chosen a single clear focus in the strategy: “We have tried to formulate a mission. To limit ourselves with regard to scope and focus. That is, however, not so simple. Such a statement also limits what you can accept, if you want to remain true to your mission at least. You say that you do this or that and consciously choose not to do something else, and we cannot actually permit ourselves to do that. We have to accept everything. Above all, we are very innovative and we keep adding new things. It is difficult to capture all this in one sentence. We have, therefore, consciously chosen not to formulate a mission. We maintain various focuses in our management.”

The market as primary focus

Of the 12 companies, five explicitly take the market as a gauge. Of two it can be said that they clearly have no vision of the market. Of the remaining companies, it cannot unequivocally be said how far their management is targeted at the market, although it is clear that the market is not the primary focus. Of the five companies who primarily operate in a market-orientated fashion, three can be classed as small companies. There is no difference between companies from different sectors for this aspect.

Illustrative for a clear market vision is company B - that, amongst other things, specialises in settlement and check systems - with 21 employees. The manager of company B is also the sales manager, a combination that clearly betrays an explicit market focus. The manager has completed an academic schooling and has been in the business for about 20 years. He has a long career behind him. His school career started at the Technical School, after which he became a baker. He was enlisted into the marines where he learned what teamwork is. He considers himself a real generalist. On the market he has a long-term philosophy. According to him one should not think too much of solution after solution, but look to the future in a clear perspective. The manager is a real networker and not only in company life. He is also active on a school board and in a college. The power of the company is creativity and - in the words of the manager - “new combinations”. This creativity is explicitly stimulated from the market. The manager uses discussions with customers to find out all about the development of a product and to make an inventory of the product's user possibilities. Based on this market knowledge, the user possibilities can be increased by introducing "new combinations". Innovation is, therefore, clearly steered from the market, whereby a strong figure, in the form of the manager/sales manager, makes an important mark.

The determination of an explicit core business/niche market

The companies visited appear to be very different with regard to core business or niche market. In general it was clear that most of the companies have a clear core business - or niche market. Of the 12 companies seven have a clear core business or niche market. Of those, most are active in the industrial sector. The size of the company appears to play no role here. Of the other companies, it cannot be concluded that they have no core business or niche market. It simply did not come over in the interview. There was only one company for whom it can be concluded that they have no core business or niche market.
Illustrative for the importance of a clear core business is the story of company C, a small market player with only three employees. Company C often works with the larger market players. This is possible because company C has a clear niche market and is specialised in a specific area, namely in present and absent and security systems. The sales manager of company C puts it like this: "That we can compete with this sort of large company is possible because we operate on so-called niche markets. We distinguish ourselves using content (crucial) knowledge. That is, however, not enough because the markets are too large. Therefore, we have to co-operate with others. Working together with large companies is often to both our advantages. The large company with whom we work installs our systems. We work within the large company concerned with the same people as much as possible, in any case with fixed installation groups. We offer that large company a market. And we have a market because the large company uses our systems. We both create a market and we learn from each other. One can speak of a mutual knowledge creation."

Structure

It has been shown that in a knowledge friendly organisation, it is important that knowledge management is facilitated. There are a number of structure characteristics that are important for this. Three of these are highlighted in this analysis: the organisation is ideally flat; the communication lines between employees mutually and between the employees and the management are short; when setting-up the structure product market combinations and/or projects are central and co-ordination is mainly done through consultation. If we look at the general image of the set-up of the organisations studied, it can be concluded that - just as was the case with the strategy - no strategic policy is followed to make the structure optimally knowledge friendly. No facilitating structure is aimed for with regard to knowledge development, acquisition and locking. That obviously has to do with the general lack of knowledge strategy. Some organisations did have the conditions present that are important to a knowledge management facilitating structure.

Short lines and a flat organisation

Of the 12 companies studied, seven are characterised by a flat organisation and short lines. These are mostly smaller companies although there are two companies with 100 employees where the lines of communication are short. The sector has no meaningful role with this factor. It is remarkable that a third of the companies studied have no obvious flat structure. Of these companies, the majority can be found in the business services area and with large companies.

Company D is an affiliate of a larger concern that has eight regional offices, including company D. A total of 100 people work at company D and the company works relatively autonomously with regard to the mother company. The company is established in design and construction management. Company D is a good example of a company that, in spite of its relatively large size, has managed to keep very short lines and a flat structure. The 100 staff only have three department heads above them with a managing director above them who is generally supported by an assistant manager. The flatness of the organisation can also be seen in the method in which the professionals function in the organisation. The assistant manager of company D said the following: "We have relatively well educated people working for us. Technical knowledge of our services is therefore very important. Commercial skills are, however, at least as important. Everyone who works for us, from high to low, has acquisition responsibility. When attracting new employees, we look for a person's social skills. We must compete on trust and human resources. To this end, you must give people responsibility, but they must also be able to handle it."

Organisation around product market combinations and/or on project basis
Of the 12 companies, five are organised around product market combinations and/or on a project basis. Remarkable is that of the seven companies who are characterised as concentrated around product market combinations and/or projects, three are large companies. Also, four of these companies are active in the area of business service providing.

Company E is an environmental advice agency and was, with its 550 employees, the largest company we studied. The company is a leader in its area and has exclusive knowledge available to them. This knowledge is built up and maintained through a laboratory in which approximately 20 per cent of its staff work. The company is also characterised by a relatively young workforce, in which many of the employees see their job with company E as training and as a springboard to a further career. The low age of the personnel gives the company, according to the interviewed office manager, a somewhat student-like culture: “Sometimes the student-like character clashes with the market requirements. We are also a company with very specific knowledge that is quite exclusive. We have clear product market combinations and the organisation is also organised around projects. The project leaders are, therefore, actually very important within the organisation. They are the ones with the knowledge and that sometimes clashes with their lack of line responsibility within the company. There is a gap between the project leaders and the company management. However, the feeling that we are market leader with our knowledge sometimes leads to a rather arrogant attitude in the market that plays with our shares. Our employees are sometimes lazy as they have the idea that they know it all. This is something we have to watch for as a company.”

Co-ordination and involving the workforce through consultation

Of the companies studied, seven try to co-ordinate primarily through consultation and so doing to include the personnel in the policies. A quarter of the companies do not co-ordinate through consultation. Of the other companies, no simple answer can be given. Of the seven companies who mainly use consultation as a means of co-ordination, four are in the industrial sector and three in the business service providing sector. The factor size does not play a role here.

Company F is a company who cannot reach their personnel by means of consultation. Company F is a service provider in the area of crop protection products and has 140 employees. The company is active in a niche market in which several competitors are active. With this market, company F is one of the smaller players. The interviewed company F manager recognises that is not going well with the sub-divided company: “The number of employees is falling. At the moment this is due to a natural wastage, but you never know if further reductions are avoidable. In spite of the good work atmosphere, this leads to much suspicion within the company, which puts the good atmosphere at risk. Another consequence is that the personnel is ageing and that a lot of practical knowledge is being lost due to the natural wastage. We haven't found a good way to combat this yet. Training is obviously an option that's being followed, but there is no clear structure in this area at this time. Even though we discuss this sort of thing more often during the management meetings and we wish to grasp things more strategically, up until now it is still the case that the person who produces the most decibels is first to follow a certain training. And that is not really ideal.”

Culture

As we have shown, a culture that optimally fits the knowledge management is mainly of a motivating nature. Three elements of such a culture are emphasised here: such a culture is informal; the culture is characterised by an open attitude (in which making mistakes is allowed and learning is important); and results are centrally determined. This is with regard to the results for the triad of knowledge domains: market, organisation and technology. It, therefore, has to do with a focus on commercial skills and results, with a focus on commitment towards the organisation and with job-specific skills and results. The culture too is in general not explicitly tailored to the motivation and sharing and utilisation of knowledge within the 12 companies. Just
as was the case with the structure, this is also partially due to the lack of an explicit knowledge strategy. Many companies are characterised by certain aspects of a knowledge sharing and utilisation culture. An impression of these companies is given in this paragraph.

An informal culture

Half of the companies studied are characterised by an informal culture. Two companies however, are characterised by their formalised culture. Of the six companies who have an informal culture, four are small businesses. Four of them also fall under the industrial sector. However, a note should be made that for the companies whose informality was difficult to determine, three fall under the business service providing sector.

Company G is a typical niche market operating company, namely in geodesy. The managing director of company G: "It's a small world. It's very pleasant together." The company has approximately 75 employees and that is actually too many for the amount of work that there is at present. That means reorganisation. Again, the manager: "Our company originated from a merger. Two cultures came together and that had to be made manageable. Obviously this was not easy. The cultures were very different from each other. In one company there was an ivory-tower mentality, think first and then act. In the other company there was a hands-out-of-your-pockets mentality, act and see what happens. That had to be made manageable. We have managed to do that reasonably well and we now have an informal organisation in which knowledge sharing has started. We take people from the field organisation and put them in the office and vice versa. We always try to keep the door open. Everybody is approachable to everyone else. That is also important due to the knowledge that is in their heads."

The openness of the culture

Of the companies studied, eight emphasise the openness of the culture, in which making mistakes is not punished and in which learning is seen as important. With one company, it can be stated that openness is not greatly appreciated. Of the other companies, openness was difficult to determine. The eight companies who found openness important are equally divided over the two sectors. The companies with an open culture were mainly found in larger companies, although the companies for whom the openness was difficult to determine were smaller businesses.

Company H is a large engineering agency with approximately 100 employees. The company was once a governmental agency and is currently trying to change the culture that obviously reigned in those times. The emphasis must be shifted to a market-orientated approach including the culture that goes with it. An important part of the culture change is opening the company up. This openness can be achieved by letting the older staff teach the younger staff, but also vice versa. The assistant manager puts it into words: "Knowledge in our company is mostly in the heads of our employees. Obviously you want to get this onto paper. That is tough but I think that in the end it is possible. A good method is to have the younger staff trained by the older (possibly retiring) staff. It is thereby best if the younger employee makes the report. The older employee tells, the younger employee makes a report for himself. That works best I think. In this way, you have documented as much as possible although not everything can be documented. It is in any case important that it happens and that it is possible."

Central determination of the result

For eight of the companies, the result is centrally determined. These are companies who have a clear commitment towards the organisation and in which the personnel manage an explicit job-specific or commercial focus. A small majority of these companies are smaller businesses in the industrial sector.
Company I is a small company with 12 employees who have established a design, prototyping and production business for all sorts of advanced structures. It is an innovative company with a clear core business. The company is characterised by a clear commitment of the personnel towards the organisation. The manager of company I - "doing business is fun" - gets most of his personnel directly from universities, usually in the form of students on work placements who decide to remain after their work placement period has elapsed. About commitment he says: "The culture is characterised by the high level of the employees and by the flat organisation with little hierarchy. There is a 40-hour working week but no one keeps to this. The staff is expected to be flexible and responsible when it comes to time. Furthermore, the orientation of the company is entirely technical. That means that all other functions (secretaries, administrators, advisors, etc.) are contracted out."

Systems

The amount to which the companies studied actually use their strategy, structure and culture for the management of knowledge - especially seeing as the small and medium-sized companies are the object of study here - can best be examined by looking at the way in which knowledge management is formed on an operational level. We have already concluded that there is no well-considered use of the strategy, structure or culture of the studied companies with regard to knowledge management. However, if we take a look at the operational level of the businesses, it becomes apparent that there is an enormous number of systems present that can be used to manage knowledge and are also used for this purpose. The systems will be reviewed here. We put the focus on the three clusters of knowledge processes for which we take the nine knowledge processes that were mentioned earlier, together:

- evaluating knowledge and determining the knowledge gap;

- acquisition and/or development of knowledge;

- knowledge sharing.

For all three of these processes, a summary of the instruments that can be used for this (found in all sorts of literature sources) is given in Table I, whereby the instruments that were found in this study were ticked off.

Eighteen instruments to evaluate knowledge and to determine the knowledge gap

First we look at the instruments that were found within the 12 companies with regard to evaluation of knowledge and the determination of the knowledge gap. The instruments are listed in Table I. This shows that of the 24 instruments that were found in the literature, 18 are found in the studied cases. Under these instruments, we frequently found things such as performance and staff appraisals with employees. The interview is also seen as an important instrument to look at what knowledge is being acquired. Many businessmen maintained files with important data about the human resources that they have. Less used instruments, but nonetheless interesting, are the systematic use of the internal e-mail system to generate ideas or consciously talk to clients, customers and sometimes even the competitors in order to find out what knowledge is important or will become important.

Forty-one instruments for the acquisition and/or development of knowledge

Second, for the acquisition and/or development of knowledge in this study, most instruments were found. Of the 53 that can be derived from the literature, 41 were used. The most common instrument used is the offering of courses to the staff in order to internalise external knowledge. Several internal courses are also given, whereby the personnel more or less train each other.
Besides this, relatively much use is made of the execution of market research or technology reconnaissance (according to the size of the company, very different in size and range) and brainstorming. In Table II you will find the instruments for the acquisition and/or development of knowledge summarised.

Twenty instruments for knowledge sharing

Of the 31 instruments that were taken from the literature for knowledge sharing, 20 were found in the 12 businesses studied. Relatively speaking, quite a lot of companies have some form of knowledge archiving. Besides this, many companies consciously organise informal meetings for the purpose of knowledge sharing. Instruments that are not seen so often are for instance the debriefing of departing employees or the formation of tutor groups or the appointment of tutors. All the instruments found are listed in Table III.

Conclusions

Strategy: hardly any systematic knowledge management policy on strategic level in small and medium-sized companies

If we briefly summarise the findings, we can conclude that there is no explicit policy that is targeted at strategic knowledge management within the 12 companies studied. Generally no goals are included in the company strategy - if this is even formulated - with regard to direct monitoring of available and necessary knowledge, nor of the development, acquisition, locking, sharing, utilisation or evaluation of knowledge.

Structure and culture: hardly any systematic knowledge management policy on tactical level in small and medium-sized companies

This brings with it that there is no explicit policy on a tactical level - that of the organisation structure and company culture - in order to make the structure facilitating to development, acquisition and locking of knowledge or to make the culture motivating with a regard to sharing and utilising knowledge. This however does not impede the fact that there are aspects that can facilitate and motivate knowledge management with regard to the organisational structure and the company culture within the businesses. Unfortunately, these aspects are not used as such.

Systems: 79 different instruments with regard to knowledge management on operational level in small and medium-sized companies

Finally, if we look at knowledge management policy on an operational level - with which we have landed at the level of systems or instruments - then it appears that in small and medium-sized companies there are all sorts of instruments used to evaluate knowledge and to determine the knowledge gap, to acquire knowledge, to develop knowledge and to share knowledge. In total 79 such instruments were found. We should, however, note that these instruments are often not seen as an instrument for knowledge management within the companies. That does not necessarily mean that there is no knowledge management. We can, in this case, point to a study into the perception of knowledge management in the British business community to whom the following statement was made: "We already use knowledge management, only we don't call it knowledge management." To this statement, an astonishing 42 per cent of the companies gave a positive answer[7]. In total, in the 12 Dutch companies, 18 instruments were found with which the knowledge gap can be determined and with which knowledge can be evaluated, there were 41 instruments found with which knowledge can be acquired and developed and there were 20 instruments found with which knowledge can be shared.

Notes
1 This article is based on the study Knowledge Management in Small and Medium-sized Companies: A State-of-the-Art Study (Beijerse, 1998). It was published by EIM as a Dutch research report and was translated for Journal of Knowledge Management to reach a broader international audience.

2 See for this, for example, the 11 layers of knowledge that Dany Jacobs presents in The Knowledge Offensive: Compete Smartly in the Knowledge Society (Jacobs, 1996). These 11 layers of knowledge are: (1) knowledge of economy and society; (2) "solid" technological knowledge; (3) strategic choices with regard to core competencies; (4) strategic positioning of products, concepts; (5) product design, user-friendliness, software; (6) integrated values; (7) brand names, advertising campaigns, imageology; (8) ability to combine; (9) reputation in networks; (10) external logistics; and (11) after sales service and feedback to customers. It is these 11 layers of knowledge that ensure an added value in the knowledge economy.

3 The importance of the difference between explicit and implicit knowledge was first clearly worded by the Hungarian chemist, economist and philosopher Michael Polanyi in The Tacit Dimension (Polanyi, 1966). The Japanese professors Ikujiro Nonaka and Hirotaka Takeuchi elaborated on this difference in The Knowledge Creating Business. How Japanese Companies Start Innovative Processes (Nonaka and Takeuchi, 1997) and show the implications of it on a business level. Nonaka and Takeuchi see the confrontations between implicit and explicit knowledge as a basis for knowledge creation.

4 These four organization elements can also be found in the well-known "7S"-model of McKinsey that the management consultants and professors Thomas Peters and Robert Waterman used in their bestseller In Search of Excellence (Peters and Waterman, 1982) in which they analyse why some businesses perform excellently. They see seven interdependent variables that are involved in every intelligent organizational approach: strategy, structure, significant values, systems, style of management, staff and key skills.

5 Here we agree with the three core competencies of businesses that are distinguished by Jan Cobbenhagen, Friso den Hertog and Hans Pennings in Leaders in Business Modernization (Cobbenhagen et al., 1995). In the study, the authors show that successful innovative companies distinguish themselves from other companies with a number of characteristics: leaders anticipate policy, they pass problems and solutions back and forth and "time": leaders innovate in a project-orientated and streamlined fashion, they work with multidisciplinary teams and more interfunctional career moves are made; leaders commercially exploit certification and think about quality in a customer-orientated fashion, they use quality care as a management instrument whereby the vision comes from above and the ideas from below, the quality of product and service are determined by the quality of the work; with the leaders, the source for product modernization in the market, thereby the client's client is just as important as the client himself, the leader is a problem solver and competes with his emphasis on service rather than on price; leaders base new products and services on existing activities, they spend more money on (contracting out) development, they are ahead with technological developments and therein have an active position to the outer world, leaders have better insight into the costs and profits of innovative efforts; leaders are active in their area; a leader tells you in five to ten minutes what his business is, what is good or bad and where one should be heading, the marketer, the producer and the research and development employee all speak the same language to a leader, they are critical and realistic; and a leader gets a market advantage from an optimum combination of technological, organisational and market-orientated competencies.

6 These factors are partially derived from the knowledge value chain developed by Mathieu Weggeman in Knowledge Management. Setting-up and Steering Knowledge Intensive Organizations (Weggeman, 1997). The knowledge value chain consists of six operational processes: (1) the determination of the necessary knowledge; (2) taking stock of the available
knowledge; (3) knowledge development; (4) knowledge sharing; (5) apply knowledge; and (6)
evaluate knowledge.

7 This figure originated from the study Knowledge Management Research Project 1998 by KPMG
in which 100 British companies with an annual turnover of above Pounds 200 million, were
questioned about the various knowledge management aspects in their business management.
Other remarkable figures from that study are the observation that 14 per cent of the businesses
questioned had never heard of knowledge management and that only 2 per cent were of the
opinion that knowledge management is a trend that means very little.

References

Studie (Knowledge Management in Small and Medium-sized Businesses. A State-of-the-Art
Study), EIM, Zoetermeer.

(Leaders in Business Modernization), Den Haag.

Knowledge Offensive. Competing Smartly in the knowledge), Alphen aan den Rijn/Diegem.

4. KPMG (1998), Knowledge Management. Research Report 1998, a full report can be found on
the Website of KPMG (http://www.kpmg.nl).

Bedrijven Innovatieprocessen in Gang Zetten (The Knowledge Creating Business Enterprise:
How Japanese Companies start Innovative Processes), Schiedam.


Kennisintensieve Organisaties (Knowledge Management. Setting-up and Steering Knowledge
Intensive Organisations), Schiedam.

Further reading

Kennis (Knowing a Lot Can Sometimes Be An Asset. About the Commercialization of
Knowledge), Assen.

Management and Conceptualising the Knowledge Management Process, EIM, Zoetermeer.

Kennismanagement voor Ondernemers (Tailor-made Knowledge for SME’s. Knowledge
Management for Entrepreneurs), EIM, Zoetermeer.

a phenomenon", Journal of Knowledge Management, Vol. 3 No. 2.


management”), HRM in de Praktijk, Issue Paper, No. 8, Deventer.

Leesboek (Society as a Spectacle. A Sociological Text and Reading Book), Utrecht.

[Illustration]
Caption: Table I; The evaluation of knowledge and determination of the knowledge gap; Table II;
The acquisition and/or development of knowledge; Table III; Knowledge sharing; Figure 1; Three
facets of knowledge; Figure 2; An organisation model; Figure 3; The knowledge cycle within
knowledge management; Figure 4; An integral knowledge management model