Wiki-Based Knowledge Management in a Transport Consultancy, a Case Study

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Abstract: Developing a Municipal Traffic and Transport Plan (MTTP) is a long lasting and complex process. Many different disciplines are involved, as well as many stakeholders. The process may take more than two years. The larger municipalities in the Netherlands mostly develop their own plans. But for the medium sized and smaller municipalities private consultancies play a major role in the development of the MTTPs. This article describes a case study concerning improving the MTTP development process in such a consultancy. The company did reasonably well in the field, but could do better: a part of the knowledge present in the company wasn't shared well enough; especially the exchange of knowledge and experience between senior and junior consultants which needed improvement. To improve the sharing, a wiki was developed. In interaction with the consultants a structure was proposed, allowing them to add the information they valued relevant for the development of the MTTPs. The wiki appeared to reveal not only explicit knowledge, but also tacit knowledge. On top of that, the tacit knowledge often was personal, subjective, and even divergent. The juniors were more eager to work with the wiki than the seniors. There still exists a difference between the generations in their ability and readiness to use ICT tools. Sharing the tacit knowledge, revealing the subjective perspectives of the consultants was confronting the company with its implicit learning styles. The staff of the company believed they worked with objective knowledge, and that only such knowledge was relevant in planning and decision making. The wiki revealed that the subjective aspects actually played a role within the company. After some interactions with the manager of the department, the structure of the wiki was adapted. One part of the wiki was meant for explicit, objective knowledge; the other part for tacit, subjective knowledge. Arrangements were made to create the role of moderator for the themes in the wiki - seniors that could decide how to deal with the subjective information. The conclusion of this case can be that wikis aren't just neutral tools. They need to be tuned to the learning styles that are available within the community that will use the tool. Pilots can help in revealing the way organisations deal with knowledge management. The article follows the chronology of the project. It starts with a short picture of the process of developing an MTTP and with a summary of the learning theories used to assess the challenges of the company. The article proceeds with the design of the wiki and the introduction of the first layout. It then describes the reactions from the consultants and the manager, and the adaptation of the wiki. The article ends with some conclusions on the way wikis can be designed.

Keywords: municipal traffic and transport planning, wiki, social software, knowledge management

1. Introduction

Traffic and transport are indispensable aspects of a town, related to virtually every other aspect, such as employment, environment, spatial planning, safety and social equity. Careful planning of traffic and transport and its infrastructure is therefore a major concern for every municipality. In the Netherlands every municipality is required by law to organise traffic and transport by a policy plan. This policy plan is known as the Municipal Traffic and Transport Plan (MTTP). After the final decision making an MTTP is valid for a period of about fifteen years.

Developing an MTTP is a highly complex process, usually taking about two to three years. It involves many different disciplines (economy, environment, public transport, traffic safety, etc.) and many stakeholders (such as citizens, drivers, bicyclists, pedestrians, Chamber of Commerce, companies, NGOs). Due to the complexity of the development of an MTTP and due to the fact that a municipality develops these plans only once every fifteen years, the development of an MTTP is usually done in close cooperation with consultant companies specialised in traffic and transport planning.

These companies also need to deal with the complexity and diversity of the process. Within the companies, various specialists are involved in the development of MTTPs. Their involvement is often temporary and often applies only to a single topic within an MTTP. A project manager will be responsible for the whole process. She has to integrate the generated knowledge, and has to keep the overview of the process within the company and within the municipality.

One of these companies asked for help in improving customer satisfaction. It turned out that the knowledge management practices within the company offered a good opportunity for improvement in order to achieve this goal. The article describes how a wiki, a kind of social software, was applied to enhance the knowledge management practices. The introduction of the wiki generated some resistance: it confronted the company with the lack of diversity in learning styles. The wiki was adapted to meet that challenge as well.

The article is organised as follows. Section 2 explains the research objective and research approach followed. Section 3 is about key notions and theoretical foundations. Section 4, 5 and 6 describe the company characteristics and the tooling built to support its knowledge management. Section 7 contains the evaluation of both the tool and the process of its introduction. The final section summarizes conclusions and recommendation that follow from the evaluation.

2. Challenge and approach

The challenge as expressed by the consultancy wasn't specific enough to create a well defined project plan. Improving customer satisfaction can be done in many ways. To support the company we chose to execute an in-company case study, in accordance with the recommendations from (Yin, 2003, pp. 13-14). The research plan had a flexible character, tuning its activities in accordance with the findings during the project. The true nature of the challenge indeed became clear during the course of the research. The approach described below is the approach actually followed. It comprised the following three phases.

1. Problem analysis and determining the research objective

The problem analysis was done in three steps:

- Discovering how the company perceived its own problem, by means of interviews (section 4).

- A theoretical analysis of knowledge management and learning processes, by means of a literature study (section 3).

- An investigation into current knowledge management practices and the support for learning processes in the company (section 4).

The theoretical analysis showed the importance of the distinction between explicit and implicit knowledge, as explained in the next section. It also revealed the variety of the learning styles actually in use in different organisations. This made it necessary to find out what knowledge-related practices in the company were available. The literature also indicated that sharing implicit knowledge might create a challenge for the organisation and would require a learning process itself.

The first set of interviews pointed out that the internal exchange of knowledge and experiences could be improved. The level of exchange of knowledge and experiences between senior and junior consultants, and between consultants with different expertise, was low. In consultation with the company the project moved towards creating a tool for this exchange.

2. Selection, building, filling and deployment of a prototype of the tool

In this phase, a particular kind of social software, the wiki, was selected as a promising device for the exchange. The prototype was built as a tool to store and exchange explicit knowledge. It also offered a number of functions to support the externalisation of tacit knowledge, such as commenting on the value and applicability of the explicit knowledge in the wiki, and storing experiences, recommendations and opinions. The prototype was filled with a fair amount of explicit knowledge on two specific topics of MTTP development. It was also filled with personal views and experiences, perceived as relevant to the authors. This device was deployed and advertised in the company (sections 5 and 6).

3. Evaluation and adaptation

An evaluation of the prototype by means of interviews with users and staff led to some practical adaptations. But the evaluation also revealed a number of constraints in the way the company could handle different forms of knowledge. The staff had trouble with the sharing of personal views and

intuitions. The wiki had to be restructured into a double system: one part for explicit knowledge, one part for the tacit knowledge. Moderators were appointed that could discriminate the quality of the contributions.

After the adaptations, a final evaluation of both the tool and the process of development and introduction was done. It resulted in a number of recommendations on how the consultancy can support their knowledge management practices with a tool such as a wiki and how company culture can be changed by such a tool and has to be changed for the viability of such a tool (section 7).

3. Knowledge and learning

This section gives the theoretical framework for the project. *Knowledge* and *learning* are complex notions for which various definitions can be found in literature. The section starts with an overview of definitions of knowledge. It then focuses on mental models and ends with theories on learning, for individuals and organisations.

Literature on knowledge and knowledge creation often distinguishes two types of knowledge. The terms depend on the specific field of the researchers, but the analogy is remarkable. The main distinction is knowledge as stock versus or knowledge as flow, Mode 1 knowledge and Mode 2 knowledge, or explicit knowledge versus tacit knowledge.

The stock-approach uses the perspective that knowledge is an objective entity. It can exist outside individuals. Knowledge can be stored in knowledge systems. The flow-approach links knowledge with experiences, perceptions, and attitudes. In this view knowledge is a competency (Kessels 2001).

The distinction between Mode 1 knowledge and Mode 2 knowledge (Mode 1 K and Mode 2 K) addresses the difference between scientific knowledge and knowledge generated in actual decision making. Mode 1 K refers to traditional scientific knowledge, structured in disciplines, each with their own rules for the generation of new knowledge. Universities are the birthplace of such knowledge. Mode 2 K is application-oriented; it relates its relevance to the context in which it is generated and applied. Policy processes often need Mode 2 K more than Mode 1 K (Gibbons et al. 1994, Gray 1999, Robertson 1999).

An analogous distinction often made is the distinction between *implicit* and *explicit* knowledge (Nonaka 2000, Brömmelstroet & Schrijnen 2009). Explicit knowledge is knowledge that can be stored in data systems, libraries, on paper or on any other information carrier. Implicit knowledge, also known as *tacit knowledge*, is the knowledge possessed by human beings which is stored in their thoughts, behaviour and even in their identity. Examples of implicit knowledge are experience, skills and intuition (Nonaka 2000).

Some implicit knowledge can be made explicit almost effortless, and therefore is easy to share with others. This is for example factual knowledge like the organisation of a municipality: who can be addressed as responsible for each element of the planning process. Other tacit knowledge is harder to share, for example when a senior consultant shows his sophisticated technique to deal with a group of stakeholders to his junior, who is not able to copy his technique directly (or even in years).

People may not be aware of the implicit knowledge they hold. Large difficulties can be encountered before such knowledge is made explicit. A good example for this kind of knowledge is intuition. The difference between tacit and explicit knowledge becomes obvious in the difference between a professional with years of experience and a junior consultant, who just graduated and who may have a good command of explicit knowledge in the field, but lacks the tacit knowledge that can only be acquired by years of experience. Fact and figures are often quite obvious, with the right modelling program they can be achieved easily. The interpretation of such data is done through years of experience, processed into tacit knowledge. This is where the quality of consultancy companies can be found.

A second important notion is that of the *mental models* that each individual holds (Senge 2006, Rudrauf et al. 2003, Forrester 1975). Research in the field of cognitive psychology and the recent brain sciences reveal the same type of insight into the way people perceive the world. Each individual perceives the world through a "filter". This filter selects the input of the outside world on the basis of earlier experiences. The mental models that people hold create these filters. The mental models store

the perceptions people have created of all the information and experiences that they acquired during their lives. Information that is new and that cannot be placed in an existing mental model is often discharged, or it is interpreted as the-same-as earlier interpretations. Through these filters, learning is confined to those fields that the person can handle, whether she is aware of that or not.

These mental models are essentially different for different people. This explains for example why people react differently to the exact same situation. That has nothing to do with the situation, but everything with the person's experiences in the past. This notion is especially important in group processes, for example in consultancy companies. The differences in perception between people become apparent and have to be taken into account.

According to Kolb, learning is a process whereby knowledge is created through the transformation of experience (Kolb 1984). Kolb observed that individual people have different learning styles. People can favour their own feelings or their own actions as the source for learning. They can also favour abstract reflection, or observing others. Most people combine two of these preferences. Kolb observed that people that can handle all four styles are the most competent in learning. He translated this notion into the learning cycle – the process whereby people learn through 1. concrete experience, 2. reflective observation, 3. abstract conceptualisation, and 4. active experimentation.

Individual people learn best through experiencing, evaluating results, generalising the experience into more generally applicable abstract concepts and lessons, applying the formed abstract concepts in a new activity. Persons that do well in just one or two of these steps fall short when they need to innovate.

This also goes for groups and organisations. Teams that are able to acknowledge variety as a source for learning, and that can apply different learning styles have greater chance to generate more knowledge and become more innovative than individuals. Yet, group learning is more complex than individual learning. Every team has to deal with a variety of learning styles and a variety of mental models. Every team needs to create a common language about the challenges, the roles, and the available experiences. Every team needs to create common scaffold for learning to achieve (Senge 2006, Van den Bossche 2006, Schrijnen 2005).

Nonaka (2000) describes learning in teams and organisations as forms of interaction between implicit and explicit knowledge. People often work together and directly share their experiences and insights. Knowledge is shared or created here through Socialisation. When people make their experience explicit, when they formalise their insights, then one can speak of Externalisation. When people connect different sources of explicit knowledge they actually make a new Combination. And, when people learn to work with the new knowledge, they will Internalise it. Together these four elements create the SECI-model. Nonaka stresses that organisations that can apply this variety of learning strategies do better than organisations that stick to one strategy.

As with individuals, organisations actually appear to have different learning styles. De Caluwé (2006) characterises five types of organisations. The three most relevant types for this paper are: the engineering organisation, the political organisation and the learning organisation.

According to de Caluwé engineering organisations consider themselves to be rational organisations. They prefer to apply and generate explicit knowledge. They work with numerical data, think in terms of measuring, controlling, and engineering. These are often engineering companies, using scientific knowledge to address problems. De Caluwé gives this type of organisation the colour blue.

Municipalities or other public authorities often work as political organisations. Such organisations think in terms of power, interests, conflicts, coalitions, consensus and public support. In the scheme of De Caluwé, their colour is yellow.

The focus of learning organisations is on processes, on motivating people to learn and improve themselves. According to learning organisations, learning and organisational change are strongly connected. Learning organisations are consultancy agencies and organisations that work with processes. Their colour is green.

No organisation fits for one hundred percent in one of these profiles. An organisation characterised as one of the above has always some elements of a different colour, especially when organisations become larger. Yet, most organisations show some preference for one of these cultures, with the analogous learning styles.

It is obvious that in complex working processes a limited set of approaches to perceiving and to learning can be a serious impediment to productivity. The awareness of its own tacit approaches towards knowledge sharing and knowledge creation can be seen as an important asset for any organisation. Being able to switch between styles (or colours) allows organisations to develop themselves to higher levels of performance (De Caluwé 2006).

In conclusion, the project had to reveal the content of the challenge (what kinds of knowledge were needed to improve the MTTP development) as well as to reveal the way the organisation dealt with the process of knowledge management.

4. The case study

The case concerns a Dutch traffic and transport consultancy. This company has a dominant position on the MTTP market in the country. This market is dynamic, so the company wants to ensure its future role in this market. The company invited us to work on improving the MTTP development process. Their presumption was that more knowledge about the needs of the clients could help them to create better MTTPs.

The first activities in the company consisted of a series of interviews with junior and senior consultants working in the firm. The interviews addressed the actual activities of the consultants in the MTTP development process, the challenges they met, the internal and external communication, and their intuitions with respect to chances for improvement.

Through these conversations a picture was created shared by most of the interviewed persons. This company is better equipped for vertical communication, the communication in project groups and management, than for horizontal communication, which is the communication between peers and different project groups. The low level of horizontal communication is due to the geographical distribution of various departments of the company. Consultants also often work in the offices of the municipalities.

This constellation gives little room for critical reflection on each others' results among peers. The consultants of the firm also tend to put little effort in sharing their experiences, other than through the sharing of the outcomes of their work – the final plans.

Another outcome is that the level of exchange between the different disciplines within the company appears to be very low. Most communication is between professionals with the same vocational background (for instance modellers, traffic experts, public transport experts).

Besides the low level of reflection the current approach to knowledge management is limited and traditional. It consists of an archive, partly on paper, which is accessible only via the staff managing the archive. It contains exclusively factual knowledge, with little or no reflection on it and no opinions.

These characteristics are in line with the characteristics of a typical blue engineering organisation, with a content focused mentality. Knowledge management is traditionally focused on sharing explicit knowledge, with little interest for the implicit knowledge.

Obviously the implicit knowledge is present within the company. It is being created continuously, by many professionals, and with good quality. Unfortunately those professionals create the same type of knowledge again and again. That asset is not available for the whole organisation, only for those employees who happen to be near the source.

Before this case study the company was not aware of the limitations of the current approach to knowledge storing, sharing and creation and knowledge management as a whole.

The interviews revealed that the collective and the individual's learning processes both need improvement. Furthermore the different professional disciplines in the organisation need to enhance their understanding of the difference between each other's present mental models.

When applying the concepts of Kolb and Nonaka, it is obvious that the company can improve its performance most likely by enhancing the process of observing each other work, by making implicit knowledge explicit. Especially the phase of externalisation needs improvement. That is the phase where the created implicit knowledge is made explicit, where it is made accessible for other members of the company.

5. Creating a support system

This analysis was shared with the staff of the consultancy. In close consultation we chose to move the project towards the creation of a support system for the exchange of the knowledge available within the company. This support system should encourage organisation wide knowledge sharing and group learning.

Theoretical considerations and the specific requirements of the company generated these requirements for the support system. The system should:

- Help in finding and accessing explicit knowledge;

- Give information on the current affairs of the colleagues;

- Help to find people with specific expertise, experience and knowledge;

- Support externalise implicit knowledge and thus making it accessible to others;

- Allow people to mirror their own mental models to those of their colleagues;

- Support group-wise reflection, teamwork;

- Support the exchange of tacit knowledge;

- Make interaction place and time independent.

A comparison of various types of social software tools showed the wiki tool as an appropriate answer to these requirements (Wikipedia 2010). A wiki is a form of social software. Social software supports social interaction and collaborative processes. It a web site, but the essential difference with a normal web site is that any reader can add pages and change existing pages. It is a dynamic tool. Wikis can be easily accessible and effortless in use, as well as safe from non-invited intruders.

Wiki software includes or is compatible with most other forms of social software. Other examples are blogging, social tagging, networking sites such as Face book, Twitter, Ning and LinkedIn, and media exchange sites such as YouTube.

The power of a wiki lies within its basic editing principles: it is easy to create, remove, edit a page or link it to another page. The history of the changes (and its authors) is recorded. The editing of a page of a wiki is as simple as working with MS Word.

6. The MTTP wiki prototype

The MTTP Wiki has been designed and built according to the requirements listed above and on the basis of several interviews with senior employees. The application was built with Google Sites, which works just fine for a prototype (http://sites.google.com/?pli=1). When the MTTP wiki will extend, a platform within the company will be better for security reasons, and for the integration with other applications.

The experiment started with an empty frame. With the help of a number of employees of the company it has been filled with content. The main structure of the MTTP wiki is:

- Organisational

- Stages of the MTTP Development Process

- Themes

The Organisational part contains an overview of the employees involved in MTTP development, the policy making process of municipalities, the instruments used in MTTP development and a number of practical pages, such as a starting page, help function, user manual, MTTP templates, etc.

The Stages part gives a description per step of the development process of MTTPs. In the case of this company these are: acquisition, proposal, policy development, measures, plan development, use, maintenance and support. Each stage is provided with explicit knowledge, such as checklists, pertinent instruments, models and templates; and implicit knowledge, for instance tips, best practices and personal experiences.

The Themes part gives lots of factual information about a number of relevant subjects or *themes*. Currently included are: transport infrastructure, spatial planning, traffic (car, cycle, pedestrian, and truck), public transport, parking, traffic safety, environment, law enforcement, hazardous goods and speed limits.

The wiki has various search options and a site navigation facility. It also has a blog function per user, to stimulate to share the personal note on the generated knowledge.

Access to the wiki is limited to employees involved in MTTP development. Apart from the fact that the wiki contains confidential information, this is also necessary in order to create the perception of safety, necessary when people are supposed to (constructively) comment on and criticise each others' contributions.

At the time of writing, the content is not yet on the desired level for all parts. But the wiki is already at such a level of quality that it serves as a starting point for the development of an operational wiki on the servers of the company.

7. Evaluation of the prototype

The prototype is evaluated in a second round of interviews with the users and intended users of the wiki. Also the manager responsible for the pilot was interviewed. The interviews were taken during the pilot phase. Most of the feedback from the interviews was immediately translated in adapting the wiki.

Some comments could be dealt with easily. Other comments concerned the way the consultants in the company viewed the process of knowledge management. Some of these comments were:

About the practicality of the tool:

- Logging in for the first time was cumbersome; this deterred some potential users.

About the content of the tool:

- A lot of information that one might expect on the wiki was not yet present.

About the process of knowledge sharing:

- For most users the time they invested in the wiki was not yet worth the effort, because they had to add more information than they could retrieve from it;

- Some discussion took already place, concerning content and personal experience, this has been experienced as a useful functionality;

- Positive experiences were mentioned in the acquisition stage; here the wiki was already helpful.

In these comments, there appeared to be a noticeable difference between junior and senior consultants. The senior consultants spent less time on getting to know the wiki. They considered themselves less in need for the information from the wiki. Furthermore they are also less acquainted to the use of computers and social software. The senior consultants were therefore less positive about the concept of a wiki to support the MTTP development process than the junior participants in the experiment. The junior consultants also were less afraid to share uncertainties than the seniors.

The comment of the manager was rather severe. It revealed some of his mental models about learning, and it revealed again the core culture of the company. He said that he expected to receive a full overview of all explicit knowledge available in the organisation, whereas the juniors could live with a wiki as work in progress. Furthermore, he didn't like the fact that people expressed their intuitions,

private perspectives, personal reflections. That type of information wasn't relevant for the MTTP development process. He considered it a threat to the quality of the work of the company. He clearly preferred a wiki solely based on objective, explicit knowledge.

In a collaborative reflection on the relevance of sharing tacit knowledge, the manager became aware of the existence of different approaches towards knowledge management and learning. After a while he could acknowledge that his expectation fitted a blue – engineering – organisation, whereas the wiki adhered to a green – learning – organisation. He himself had to reframe his perspective on knowledge management, in order to allow the professionals in his department to communicate and learn in different ways. With this awareness, he could give his support to the new approach.

A further requirement was added to the list:

- Allow people to express opinions while keeping a clear distinction between factual knowledge and opinions.

This requirement gave rise to a redesign of the structure of the wiki. It now has a space for explicit knowledge, and it has a clear space for implicit knowledge, for subjective stories, for blogs, for hunches and questions. The dual structure enables the sharing of both types of knowledge. In this way, the wiki really enables the consultants to work on the externalisation of their implicit knowledge.

In the design of this wiki, it is the responsibility of the contributor to assure the quality of her contribution, for instance by actively inviting others to review it. Simultaneously, for every theme a moderator is appointed to check on a regular base the quality of the content on the wiki.
The quality of knowledge and information added to a wiki is always an important point of attention. Factual information needs to be reliable. The participants that add personal, implicit knowledge and intuition need to do so with integrity. Applying the rule of reliability and integrity allows the professionals of the company to not only share crystallised knowledge, but also to learn form each others hunches, intuitions, questions, personal opinions.
To emphasise this aspect, the texts of the interviews were added to this part of the wiki.

The content of this wiki is in a continuous process of improvement, representing the state of art of the MTTP development within the company. It represents the concept of knowledge as flow, as well as the concept of knowledge as stock. This approach mirrors the way blue cultures learn.

So, the experiment did have several important second order effects:

- The organisation became aware of the opportunities that tools such as a wiki can have;

- The organisation became aware of its lack of horizontal communication among peers.

- The organisation also became aware of the effort that it takes to introduce and fill a wiki and to keep it alive. It realised how radical and comprehensive the change would be when seriously introducing a wiki and adapting work procedures to it. This would be little short of a change in company culture.

Overall, given the fact that there already was a clear need for change, the experiment ended with the company becoming genuinely interested in the new concepts, the new way of working and the tools supporting it. It was going to seriously consider the strategic decisions needed to develop and introduce an operational wiki, for MTTP development as well as for its other activities.

8. Conclusions and recommendations

This case study was about improving the process of developing municipal traffic and transport plans in a medium sized consultancy, by means of enhanced knowledge management. The core idea was to support this knowledge management using a social software tool, the wiki. This choice was based on theories on knowledge, learning and knowledge management. The implementation of the wiki created another level of learning within the company – not just on the content of the MTTPs, but also on the way the company dealt with knowledge management. The case study leads to two main conclusions.

A wiki can be very useful for the purposes of knowledge sharing and group wise learning in complex development processes. It has a number of practical functions:

- It serves as a database for implicit and explicit knowledge;

- It helps in sharing knowledge and experiences acquired during development processes;

- It helps to find experts and their knowledge in specific areas;

- It helps in organising the reliability of the resources it offers;

It also has a number of functions that have to do with the learning culture in an organisation:
- It helps people to make their mental models explicit and become aware of their subjectivity;

- It helps in creating knowledge collectively, in a group process, in which contributions from one participant are reviewed and adapted by others; it stimulates exchanging tacit knowledge;

- It stimulates peer-to-peer, horizontal communication; among other things, it is not hampered by place and time dependency, such as in voice communication, or ordinary meetings.

The introduction of a wiki in a large organisation will meet lots of difficulties. This has to do with the fact that the development, filling and introduction of a wiki are short term cost factors, whereas the benefits are long term. When in use, contributing to it remains a short term cost factor with no immediate benefit. In situations under time pressure, more common that not in consultancy companies, there will be a tendency to only consume from the wiki and not to contribute to it. Without extra measures to deal with this problem, there is a serious risk that the endeavour may fail.

This brings us to the following recommendation for consultancy companies that consider the introduction of a wiki as a tool for knowledge management. Such a step can require a fundamental change in the company culture. A change like this can only be successful when based on a strategic decision with comprehensive commitment from all levels of the company.

A wiki requires a minimal size and a minimal level of regular contributions in order to become viable and fruitful to its participants. First of all, it should be made easily accessible independent of the user's location, safe and attractive to use, and adequately supported by the necessary training and maintenance. Until it reaches the critical mass, most people will consider it a cost factor. that it will remain a cost factor as long as it has not yet reached critical mass. Support by management is necessary to overcome the short-term-cost-versus-long-term-benefit problem. One may think of measures such as the following:

- Measure the contributions to the wiki per employee and reward those that contribute to it more than average. Refer to these data in the regular performance interviews with employees.

- Integrate the wiki into standard working procedures. If project management data and project repositories become part of the wiki, it will become nearly impossible to write proposals or project deliverables according to company standards without the wiki. Even though this is not the primary goal of the wiki, it helps in achieving regular use of it and thereby helps to achieve its primary goals in knowledge creating and knowledge sharing.

- Stimulate especially the junior employees to work with the wiki. Stimulate them to help senior employees to get involved with the wiki too.

However difficult it may be to introduce social software tools such as wiki's, one should be well aware that the productivity gains of an effective knowledge sharing and group collaboration tool are likely to be considerable and may become a decisive competitive factor in the near future.

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