AN INNOVATION DRIVEN KNOWLEDGE MANAGEMENT FRAMEWORK FOR SME

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Abstract: Over the last decade many SME organizations have understood the strategic importance of managing and leveraging a wide variety of intellectual assets that are usually found scattered across individuals, departments, documents, and databases. While various researchers and vendors have developed and implemented specialist Knowledge Management Frameworks (KMF) for large organization, many small and medium enterprise (SME) organizations still face the challenge of selecting affordable frameworks including strategies, tools, and methods, which fit their objectives and needs as SMEs and then successfully implementing such frameworks. This paper presents an empirically validated I-KMF to establish a solid foundation for evolving KM into sustained SME organizational best practices over time. The newly created knowledge contributes to the necessary diversity for organizational growth and renewal, while the application of knowledge leads to performance improvement or value creation. In the first section of this paper, we are discussing the problems of the current KM practices in SME compared with large organizations. In the second section, we are presenting the need and advantages of developing an integrated, affordable, and Innovation-driven knowledge Management Framework for SME. The third section is a detailed description of the framework. Section four represents the framework best practices approaches and validation. Section five represents the conclusion.
Keywords: Knowledge Management, SME

1. Introduction

Over the last few years most organizations have realized how important is to manage asset that are usually found scattered across departments, individuals, database, and documents. While various researchers and vendors have developed and implemented specialist Knowledge Management Frameworks (KMF) for large organization, many small and medium enterprise (SME) organizations still face the challenge of selecting affordable frameworks including strategies, tools, and methods, which fit their objectives and needs as SMEs and then successfully implementing such frameworks.

1.1 Knowledge Management in SME

Knowledge management is an on-going process and it changes to meet current organizational needs. Drivers for knowledge management are not related to size, organizational structure or industry. How and indeed if knowledge management can be achieved depends on a number of factors such as potential benefits, competitive forces, or the capacity to implement.

To better understand problems of the current KM practices in SMEs compared to large organizations we need to understand some distinguishing elements and compare between KM in SMEs and large enterprises.

There has been much literature on the practice of knowledge management within large organizations and little information available on SMEs (small-to-medium-sized enterprises). This section aims to make a brief comparison between SMEs and large organizations. The comparison will primarily focus on the following:

1.1.1 Management

In SMEs, the managers are in most cases the owners, which imply that decision making is centralized, and fewer layers of management. This means that decision-making is shorter than in large organizations. The advantage for the owners in SMEs is that they become the key drivers for knowledge management implementations, assuming of course that they appreciate the importance of knowledge management. Another distinction to be made is that management of SMEs has to look after every aspect of the business which gives them limited

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time to focus on the strategic issues relating to knowledge management. Senior management in larger organizations in contrast have the power to delegate some of their responsibilities to lower management, thus freeing their time to focus on knowledge management strategies (Ghobadian 1997).

1.1.2 Structure

SMEs have an advantage over large enterprises in respect to their structure, in implementing knowledge management. They have a simple, flatter and less complex structure, which will facilitate a change initiative across the organization since functional integration both horizontally and vertically, is easier to achieve and fewer complications will be encountered. Whereas larger organizations have a bureaucratic structure; making them slower and less flexible in creating new schemes. One of the advantages that larger organizations have over SMEs is the level of specialization in their roles, which gives them better expertise in implementing knowledge management.

1.1.3 Culture

SMEs tend to have a more organic and fluid culture, than larger organizations. Smaller number of people usually united under common beliefs and values, which implies that it easier for smaller organizations to change and implement knowledge management. It is easier to create a knowledge sharing culture in smaller organization than in larger ones (Wong 2004). In smaller organizations the cultural values and beliefs of the employees can be influenced by the owners. This can be a problem if the owner does not trust his employees or does not encourage the culture of sharing and transferring knowledge. In this case, the owner can obstruct the development of knowledge rather than develop it.

1.1.4 Human resources

SMEs have a problem in attracting high caliber, experienced employees. These experienced people, tend to go to larger organizations, where they will be paid higher salaries and bonuses. Furthermore it also a problem for SMEs to retain, specialized employees, because of limited opportunities for career progression, and the constant appeal of larger organizations, who can provide better prospects. SMEs are mostly seen by some employee as a stepping-stone to move to larger organization. The departure of highly knowledgeable employees is a major threat to SMEs, unless that knowledge is captured, codified, and transferred throughout the organization (Subramaniam 2005).

The topic of innovation driven knowledge management had also received much attention from research and industry in the past number of years. However, much of the research has focused on the large enterprises with much available financial wealth and planning infrastructure required, in order to be effective at managing innovation. This research has not greatly benefited SME’s due to the key differences in industry practice between large, medium and small enterprises mentioned above.

Our thesis states that the existence of innovation driven, well defined, simplified, affordable and empirically validated framework will help SMEs to greatly benefit from knowledge management.

2. Knowledge management and innovation

2.1 Innovation as a knowledge management process

Firms are both systems of interlinked operating processes and knowledge organizations. On the one hand, resources are configured and managed to "keep the mainstream flowing". On the other hand, new knowledge is introduced through newstream (Kanter 1989). New

knowledge is central to the innovation. However, knowledge itself does not ensure profits. The value of knowledge lies on its effect on mainstream. Successful innovation requires linking knowledge to operating processes in an effective and efficient way. As Schumpeter noted, innovation is not only the invention of something new, but more importantly the successful exploitation or commercialization in the market of this invention (Schumpeter 1934).

In this view, novelty and commercialization are two key distinguishing features to recognize innovation. From the knowledge-based view or knowledge management perspective, novelty comes from knowledge creation whereas commercialization is accomplished by knowledge application. The newly created knowledge contributes to the necessary diversity for organizational growth and renewal, while the application of knowledge leads to performance improvement or value creation.

Thus, knowledge creation and application are two basic aspects of innovation. Knowledge creation is associated with that part of the innovation process through which new knowledge is introduced. Knowledge application is the process of putting knowledge into practice to realize the latent potential of knowledge. Innovation is a knowledge management process that extracts new value from a firm's knowledge assets.

2.2 Knowledge management resource and innovation

Innovations are not created directly; they are only created once all the factors involved have combined appropriately. Organizations are purposeful systems containing purposeful parts, people, and groups of people, physical assets, and technology. These factors can act together, producing systemic behavior that the parts cannot produce on their own but for which they are mutually causally responsible. That means that all factors should be aligned and orchestrated around the theme of innovation. Innovations often are oriented to problem. They are the processes where knowledgeable and creative people and organizations frame problems and select, integrate, and augment information to create understandings and answers (Teece 2001).

The factors involved in knowledge management process have a great influence on innovation. Based on a review of the literature on Knowledge management framework, Rubenstein Montano et al. claimed that the majority of the frameworks only focus on the knowledge processes without consideration of factors that influence them in the context of systems thinking (Rubenstein 2004). These factors include purpose of the organization, knowledge, technology, learning, and people/culture. Organizations should link various KM related resources to the strategic goals of the organization. Two key resources that support KM were asserted by Chuang (Chuang 20004).

3. Innovation Driven Knowledge Management Framework

This paper presents a three-phase framework to an Innovation Driven Knowledge Management Framework (I-KMF) implementation.

- Strategy
- Planning
- Implementation

3.1 Strategy

A clear underlying innovation driven strategy is very essential to guide the knowledge management system. The associated knowledge related to business improvements are to have a significant impact on the organization’s bottom line, and the first strategic step for a

successful I-KMF implementation is a well-defined business objective (Smith 2005). The I-KMF strategy process consists of:

- Formulating a measurable business objectives
- Securing appropriate and ongoing executive sponsorship
- Identifying and tackling cultural resistance to knowledge sharing
- Identifying and/or staffing the KM forum or group

The ultimate goal of any organizational initiative is to a long term economic value to the organization, an I-KMF implementation should start with a tangible objective that clarifies the focus for KM across all stakeholders (Brown 2001).

A successful I-KMF implementation should acquire and early sponsorship from executives and senior management and ensure the continuous support through out the system stages. Executive sponsorship and adequate funding will make the KMF implementation a tangible and real initiative, one that will motivate and drive the KM team or group to make it a success. It will create awareness and ensure the availability and participation of others in the organization, especially subject matter experts and potential end-users of the KM system (Zollo 2001).

The strategizing phase of the I-KMF implementation is also the best time to identify and create plans to tackle any organizational resistance to knowledge sharing. Resistance usually stems from a fear of the unknown and how it will affect roles, responsibilities, and job security. Usually no one will openly admit to being opposed or reluctant to share what they know.

The challenge is to identify and work towards mitigating concerns without explicitly labeling them as fear or resistance. It is important to objectively understand the level of resistance, as well as its main source. This will help reduce the risk of implementing an I-KMF initiative that has excellent processes in place, but very little knowledge that is actually shared and used.

A carefully planned and adequately staffed KM team or group will ensure that the implementation doesn't get treated as extra or additional work, but rather as a key organizational initiative.

3.2 Planning

The strategic importance of KM makes it one of the most dynamic business variables – something that constantly changes and evolves – and therefore an initiative that needs the same attention and detailed planning as any other system. Based on the overall strategy, KMF implementation planning should first identify the target end-users and subject matter experts, conduct a detailed business needs assessment, and identify the critical first phase of the implementation. It should also ensure that the right set of content is put together and effective workflow processes are designed (Boland 1995). The planning process consists of:

- Identifying key target consumers and subject matter experts
- Identifying a small, but critical first phase KM implementation
- Investing in detailed business needs assessment
- Selecting and creating relevant and adequate knowledge content
- Designing simple and effective knowledge workflow processes

Unless a target audience and subject matter experts have been clearly identified, a KM implementation is more liable to move in the direction of a general information dump—a Web interface to hundreds of documents, presentations, and graphics. Those who need knowledge will still not be able to find it, making the KM implementation little more than just a Web-enabling exercise.

The challenge is to implement KMF not for the sake of KM, but for the creation of business value for a focused user community.

The process of determining overall business objectives, identifying target knowledge consumers, and conducting a detailed needs assessment will typically result in a much larger vision than originally envisaged. The challenge is to not get overwhelmed by the scope or attempt to tackle too much too soon.

3.3 Implementation

A successful implementation of any I-KMF implementation depends almost entirely on effective project management. The challenge is to stay reasonably within the decided scope, yet allow room to incorporate user feedback, prioritize and implement change requests, and finally deliver to a realistic schedule.

Often even small KM implementations do not pay enough attention to the actual knowledge content—Web pages, documents, FAQs, solution finders, searchable databases, and external syndicated information. The challenge is to not get inundated with information, and yet identify adequate and relevant knowledge to kick-start user adoption of the KM system.

Any successful KM implementation will witness the creation of new knowledge and modifications to existing knowledge within the very first week of rollout, if not within the first few hours. The KM approach design and process workflow used to manage this knowledge evolution will directly impact end-user adoption.

I-KMF implementation should also ensure the involvement of the user community at all times, pay specific attention to knowledge quality, and effectively market the I-KMF across the organization. The implementation process will include the following three steps:

- Capturing
- Sharing
- Leveraging

3.3.1 Knowledge capturing from experience involves two operations. The first is based on recording events i.e. blog, audio diary, or forum thread and the second is based on personal reflection and abstract conceptualization of the events i.e. debriefing.

Personal knowledge that is involved in day-to-day events is very complex and is not generally available outside the person.

However in practice, sometimes knowledge transformation and leveraging does take place through people telling stories about the events they have experienced. Zimmerman proposed diaries as a simple tool for encouraging people to capture events (Zimmerman 1977).

A diary is a record of events, maintained by the subject over time, which can then be reviewed and analyzed (Burns 2001). It provides the participants in projects an opportunity to record their experiences, perceptions and feelings about their daily operations on site relatively soon after they occurred.

3.3.2 Knowledge sharing or debriefing refers to a purposeful reflection in a social interaction which assists learners to develop generalizations and to transform experience into learning. The rationale behind purposeful reflection is that the individual learning can be enhanced by this approach, and the individual lessons can then be aggregated, validated, and synthesized to produce organizational learning (Boyd 1996).

After a number of diary entries, blogs, or forum threads, participants may share accumulated knowledge through specific mechanisms such as debriefing or mutual reflection and collaborative sessions to analyze their learning and to provide a deeper interpretation of the events. Debriefing is a powerful tool, which can make explicit the tacit learning so that it can be leveraged and transferred to a wider audience and ultimately to the knowledge repository of the organization.

3.3.3 Knowledge leveraging process will include the following actions:

- Marketing the KM Implementation within the organization.
- Obsessing about knowledge quality.
- Effectively manage a flexible project scope to encourage innovation and creativity.
- Keeping the user community involved at all times.
- Taking I-KMF Implementation success further.

Most organizations have multiple initiatives competing for executive and employee mindshare at any given point in time. Even if the initial I-KMF implementation is targeted at a very small user community, there is a risk that it will get lost amongst many other projects. The challenge is to stay focused on the business objectives of the KMF implementation and at the same time garner increased exposure and mindshare.

If there is anything worse than not being able to find a critical piece of knowledge, it is finding erroneous, duplicate, or outdated material. Having determined the right content for the first implementation, the challenge is to ensure that it is as flawless as possible from a quality perspective with project schedules.

4. Framework Best Practices and Validation

We looked at two case studies for this paper introducing a simple, yet robust knowledge management best practices approach for SMEs.

4.1 Pacific Lifestyle Publishing Case Study

The case study was conducted on a small-to-medium sized organization called Pacific Lifestyle Publishing. Pacific Lifestyle Publishing (PLP) is a highly successful Australian publishing company that produces nine narrow-market niche magazines. Its stable of vibrant, high quality life style publications covers such interests as surfing, snow sports, motocross sports, skating and young women's leisure activities.

The magazines have readers across Australia, New Zealand, USA, UK, South Africa, Japan, Malaysia, Singapore and Peru with readership numbers from 40 000 to 200 000 for each issue of each magazine. The majority of readers are under 25 years old—except for one surfing magazine, 90% of whose readers are over 25.

PLP is located on the top floor of a modern office building in a coastal location in eastern Australia, less than half a kilometer from the famous surfing beaches of the Pacific Ocean. PLP employs over 60 staff, the majority in the main office on the Australian east coast location with sales offices in two other capital cities and a production and sales office for a surfing magazine in New Zealand. The main office is divided into six teams—editorial,

design, production, sales, marketing and administration—each with a director in charge. There is also a circulation manager who is responsible for the magazines reaching the readers.

Meeting publications deadlines and customer expectations required a continuous development of staff members to occur through a consistent workplace learning process. PLP held a two day strategic planning seminar with the director and managers at a location away from the main office (I-KMF phase I and Phase II). The seminar was facilitated by an outside facilitator from Business Improvement Australia, with an aim to create a strategic plan for the next five years. For PLP, this core knowledge was seen as:

- Ensuring that customers' needs are met through high levels of competency in all technical aspects of the tasks needed to publish the magazines.
- Making all efforts to exceed customers' expectations.
- Having uncompromising integrity and maintaining the highest personal standards of ethical behavior in everything PLP do.

Interestingly, two other sets of core knowledge were seen as important. The first of these was for staff to relate to each other in a respectful and friendly way. The second was to have fun and do great things. As will be seen in the discussion under culture, these two sets of core knowledge were evident in the organizational records and in the interviews (I-MKF Phase I and Phase II).

The second contribution of strategic planning to knowledge management is its role in supplying new knowledge. Again, this was seen at PLP. One of their main competitors had attached a DVD to a special edition of their magazine. On seeing the success of this new idea, PLP decided to investigate the possibilities. Using a logical examination based loosely on Force Field Analysis the management team found a viable and cost-neutral option to include a DVD on future editions of their star surfing magazine.

However, for a successful outcome, new knowledge had to be imported (I-KMF Phase III). Some of this new knowledge came from a search of literature and from examining alternative types of equipment. Further new knowledge was imported through the selection of a new member of staff.

The first edition of the magazine with a DVD attached was successfully launched at the beginning of 2004, with sales for that edition increasing significantly. The organization used strategic planning to better manage its core component resources including employee's tacit knowledge and executed a well formulated plan to capture the knowledge within the organization (I-KMF Phase II) and demonstrated good example best practices for the proposed I-KMF knowledge management framework.

PLP, then, makes a good use of knowledge management processes ti manage its knowledge capital. The organization strategic planning (I-KMF phase I), selection (I-KMF phase II), and implements the I-KMF, though, it is not implemented in a formal sense. Rather, managers use workplace learning with an approach very similar to the I-KMF.

4.2 The Computas Case Study

The case study investigates the usage of a knowledge repository at Computas. Computas is a medium sized consulting company based in Norway, developing knowledge-based systems for a variety of customers. The company offers services in industrial use of knowledge-based expert systems, and software in the field of artificial intelligence.

The Knowledge Management Process at Computas includes handing out a prize to the "knowledge sharer of the month" in order to promote knowledge management. This prize has

been given to people who share their knowledge through Computas's knowledge management tools, or through oral communication. Computas has a variety of knowledge management tools available on their Intranet (Davenport 1998). One of the tools is the unstructured knowledge repository "Well of experience", or WoX. It is an informal internal knowledge repository (Van Heijst 1997). It is a small tool for capturing knowledge that would normally be written on yellow stickers, what the company calls "collective yellow stickers".

The yellow sticker analogy was in fact a major midwife aid in the initial understanding and practice for getting the system to be used. “Rather than using the post-it note, write your private yellow sticker in the WoX system so others can make use of them” (Van Heijst 1997). That way the employees always know that there will be some information of use in the system. This way of contributing to the repository is what is described as a passive collection process .

WoX contains everything from the phone-number to the pizza restaurant on the corner to "how you set up SmallTalk on a special platform". One can find information by searching an unstructured database, and can give "credits" to notes that he finds useful. Notes with more accumulated credits about an issue show up before notes with less. The tool contains a mechanism to give feedback to the person who wrote the note, and there has been a kind of competition in the company to get the most credits.

One developer described this repository as "quite useful - it is simple enough to be used in practice". Another said “you can use WoX as a personal notice board where you can put the same information as you would on a yellow sticker. It’s fast to insert notes, and you do not have to worry about where to put it”. In less than two months the notes in the repository rose from around 600 "experience notes" to containe around 990 notes and have had about 15,000 searches by 260 users (some customers are also allowed to use the tool in addition to Computas employees).

There are 2,300 keywords in the repository. Employees can search the knowledge repository using a simple search interface available on the company Intranet. The functionality is simple keyword search, and one can browse the notes and comments on other people’s notes that he has contributed, the credits notes have gotten from others, the latest 10 notes that have been added to the repository, popular keywords as well as the notes with the most credits. In the simple search, one can select if he wants to search in the text and subject information of the notes or also in the comments on notes.

Each note contains a subject, a descriptive text, as well as keywords (the one submitting the note defines the keyword, there is no predefined list of keywords), author information and the date it was submitted. When viewing a note, everyone can add a comment to the note, give the note a credit or mail the note as a tip to someone else.

According to one developer "people are very good at submitting notes when they think that something can be useful for others". A manager described it as "a behavioral arena that people use in different ways, that is creating a culture of knowledge sharing and even creates expectations and lets people experience that others make use of their knowledge". The tool is promoted by posters which can be found on places that people visit a lot.

When people were asked to describe what kind of tools they were using in their work, almost all of the developers mentioned that they were using WoX. All developers but one (seven out of eight) say that they have written experience notes, and all of them have tried to search for experience notes.

Based on the material from Computas it was found that five different types of usage of the knowledge repository:

- Solve a specific technical problem.
- Getting an overview of problem areas.
- Avoiding redundancy in having to explain the same solution to several people.
- Improve individual work situation by adjusting technical tools.
- Finding who has a specific competence in the company.

The study of Computas case examined how an informal knowledge repository is used in a medium-sized software consulting company. It was found that the well of experience, WoX, is especially appreciated amongst developers and used to a wide degree compared to other similar tools in other companies, even though the company is quite small for a codification strategy.

5. Conclusion

Innovation is a knowledge management process, involving creation, integration, sharing and application of knowledge. A phased best practices driven approach to knowledge management will help create an innovative knowledge-enabled organization, where KM evolves from being a software application to a way of life. This paper presents best practice I-KMF implementation that aims to facilitate SME innovation knowledge management in a dynamic environment. In this paper we proposed a three-phase I-KMF for SMEs to better address of the current KM practice in SMEs compared with large organizations.

The first phase related to KM Strategy includes formulating clear objectives; obtaining executive commitment; and tackling organizational resistance to knowledge sharing.

The second phase related to KM Planning details best practices to identify knowledge consumers and subject matter experts; assess KM-related business needs; determine the first step of the implementation; collate and create knowledge content; and design effective workflow processes.

The final and third phase of KM Implementation include those related to planning the project; managing a flexible scope; balancing schedules with objectives; keeping the user community involved; and selling the KM initiative to all the SME stakeholders. For the purpose of I-KMF validation we presented two case studies for best practices approach in three different domain SMEs.

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