Knowledge management strategy for Small and Medium Enterprises

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***Abstract*—** The paper focuses on the importance of knowledge management in the knowledge-driven economy, and its role for SMEs. It stresses the need of linking knowledge management strategy with the corporate strategy in order to gain maximum benefits. The success factors for knowledge management implementation are considered as well. A special focus is given on the need to undertake knowledge audit as an initial step for any knowledge management initiative, as well as a tool for monitoring knowledge management implementation and results. Some strategic approaches suitable for KM in SMEs are presented as well.

***Keywords*—** knowledge management strategy, success factors, knowledge audit, SMEs.

I. Introduction

THE importance of knowledge is recognized since centuries. In the ancient time, knowledge was a 'privilege' of state and religious leaders providing them a strong tool to keep masses in subjection**.** For centuries, craftsmen have taught apprentices to do the job, while owners of family businesses have passed their commercial wisdom on to their successors. In the middle ages, the low literacy level of the population was a serious obstacle for gaining benefits from available knowledge in books. The situation enormously changed in last century – driven by the technology revolution and the global access to knowledge via Internet, as well as with the drastic changes in global literacy. While at the beginning of 20th century some 'islands' of higher literacy levels in the population existed, mainly in Western Europe and the USA, today, only some 'spots' could be found on the globe with low levels of literacy. The changes in higher education patterns towards mass participation have contributed to building a more sophisticated work force with higher skills and knowledge, and the rapid development of Science and Technology (S&T) brought faster changes in technology, products and processes [23]. The knowledge-intensiveness of economy today is one of the reasons for researchers to consider that the foundation of organizational competitiveness has shifted from physical and material resources to intangible resources, and knowledge in particular [18]. In fact, knowledge is a concept discussed by philosophers since centuries, but its importance for the business world was just recently recognized [8], [13].

The globalization of businesses and the emergence of strong international competition, the market liberalization and volatility, the availability of sophisticated customers, suppliers and competitors, the fast ageing of information, knowledge and technology, – these are other external drivers of knowledge management (KM) today [13], [19]. At the same time, organizations recognize the growing importance of KM for their own success – to innovate faster then competitors; to increase their efficiency, productivity, product and service quality; to increase organizational knowledge capital and its richness; to keep knowledge of their employees in time of high workers' mobility, etc. [17], [19], [20].The adoption of KM as company practice was driven by large organizations world-wide. The company practice has shown that knowledge, when properly used and leveraged, could drive companies to become more innovative and thus, more competitive. KM is now considered as established practice in large organizations and multinationals (e.g. Honda, Cannon, NEC, Sharp, Ford, PriceWaterhouseCoopers, Texas Instruments, HP, etc.). They have long recognized the need for KM in order to respond quickly to customers, create new markets, rapid develop new products and handle emergent technologies [20]. Consulting companies, for which knowledge is a core asset, were among the first businesses to pay attention to KM and make heavy investments in it, as well as explore the use of information technology (IT) to capture and disseminate knowledge [14].

The concepts, tools and methods of Knowledge Management are recognized to be important as well for small and medium enterprises (SMEs) in the knowledge-driven economy [3], [21], [24]. Improving decision making and knowledge sharing, faster innovation, reducing duplication of work and improving business processes, managing knowledge resources, etc. could constitute important reasons for SMEs to undertake a KM initiative [18], [21], [23]. Nevertheless, KM is making very slowly its way to SMEs. One of the factors behind this is the insufficient awareness and understanding of KM among SMEs managers [21]. Another reason is the lack of resources, both financial and human, for developing a comprehensive KM strategy. Lack of vision, short-term planning, not sufficient technical expertise, lack of resources and methods to respond to the increasing customer expectations and market changes, etc. could be also serious barriers for any KM initiative in SMEs [3], [18], [20].

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Different KM strategies and practices are proposed by scholars [10], [11], [14], [25], [28], [30], [32], [35], [44]. The case studies of KM implementation in large enterprises could provide examples on methods and tools utilized in KM, and thus help SMEs to choose the most appropriate for them strategy [15], [18], [19], [20]. Often SMEs do not possess the necessary in-house human resources for implementing a KM initiative and need an external expertise. Besides, a large KM program makes no sense for some of them. Therefore, it is essential to localize and personalize the approach to the particular company [3]. It should be taken intro account organizational specificity, its internal and external environment, and to adapt the KM methodology accordingly. It depends on the organization's leaders to consider which KM strategy and tools are best suited to organizational goals, needs and financial resources.

This paper focuses on the main characteristics of SMEs and on this base considers some KM strategies and tools which could be more appropriate for them. It provides a theoretical insight for developing a KM strategy and highlights some success factors for its practical implementation. Knowledge Audit (KA) is discussed as a basic step for determining the KM strategy and monitoring it afterwards.

II. Knowledge management and SMEs

A. Characteristics of SMEs

SMEs are considered as a backbone of economic growth in most countries, however, they are faced with several challenges today such as: global competition, shorter product life-cycle, needs for continuous innovations [3], [18], [21]. SMEs are characterized by simple and less complex structure managed in most cases by its owner, flexible and adaptable business processes, modest human resources and expertise, smaller customer base, etc. (Table I). Organizational "amnesia" is often characteristic for SMEs as they often fail to retain knowledge acquired and lessons learned in the past, and are more influenced by employee turnover. Singh et al. [18] stress that most SMEs are focused on their survival, rely on outdated technology, labor intensive and traditional management practice. This is often due to the fact that their managers have pure skills for strategically thinking. Problems of small firms in developing quality culture are resistance to change, lack of resources, etc. Regarding Information and Communication Technologies (ICT) adoption, SMEs mostly apply an ad-hoc approach dependent on their networks to large enterprises and their competitors. However, a number of preconditions exists which could facilitate the introduction of KM in SMEs easier than in large companies [18], [22]. For example, SMEs have flatter structure and less management levels, more simple systems and procedures then large companies. At the same time, the organizational culture is easier to change and to adapt to the KM needs as it depends normally on the attitude of the owner(s) of the company.

TABLE I
SMEs characteristics [21]

Ownership and management	Mostly started, owned and dominated by entrepreneurs Owner is the manager at the strategic apex Centrality of decision making - few decision makers Directive and paternal management style more prevalent Top management highly visible and close to the point of delivery Modest management skills and competency
Structure	Simple and less complex structure Flat structure with few layers of management and hierarchy Flexible structure and information flows Multi-tasked owner-managers Division of activities limited and unclear Low degree of specialization - more generalist
Culture and behaviour	Unified culture Organic and fluid culture Departmental/functional mindset less prevalent - corporate mindset Very few interest groups Operations and behaviour of employees influenced by owner-managers' ethos and outlook Results oriented
Systems, processes and procedures	Simple planning and control system Informal evaluation and reporting system Flexible and adaptable processes Focus on operational processes - less focus on strategic processes Activities and operations are less governed by formal rules and procedures Low degree of standardisation and formalisation Mostly people dominated
Human resources	Modest human resources Modest know-how with less expert professionals Employees are more versatile Training and staff development is likely to be ad hoc and small scale Closer and informal working relationship Low incidence of unionisation Low degree of resistance to change
Customers and market	Normally dependent on a small customer base Mostly local and regional market - few international More frequent and closer contact with customers Many know customers personally and socially

B. Challenges for KM application in SMEs

The knowledge management practical implementation in SMEs is a tough and challenging task. As stated in [33], the processes of KM introduction in SMEs include building KM awareness, determining its intended outcomes, auditing and valuing knowledge assets and resources, and finally, developing and implementing those KM solutions that have the best potential to enhance knowledge and add value to the organization. Even knowledge-intensive SMEs often do not recognize the importance of KM due to the fact that owners/managers of SMEs do not perceive KM as a business critical function [20]. As case studies show [20] even if companies collect and store explicit knowledge, they do not seem to make active use of them as a source of knowledge as few employees actually bother reading or searching for information from these sources.

The practical results of a survey among 199 SMEs in 7 EU countries (Greece, Bulgaria, Cyprus, Germany, Ireland, Austria, Romania) made in 2006 highlight some barriers for KM implementation in SMEs [2]. The lack of person to lead the KM implementation within the company (KM champion) is one of the major challenges, followed by management resistance, lack of experience in the senior management, and lack of financial resources. Generally, cultural and organizational barriers represent the major obstacle for KM implementation, differing from country to country [2].

Among the barriers for KM introduction, the most relevant to the SMEs are as follows [3]:

- *Time and priority* - SME managers often lack time and resources to focus on the meaning, implications, capturing and sharing of organizational knowledge management.
- *Lack of management commitment* - SME managers and entrepreneurs are highly involved in the operational activity and usually do not actively support the KM actions and tools.
- *Fear to share knowledge* ("knowledge is power") - SME managers and entrepreneurs are suspicious to share knowledge in order not to loose the company control, the competitive advantage, the information flows toward competitors, etc.
- *Apathy about sharing knowledge* - the lack of management commitment is crucial for the company culture and the staff attitude to share knowledge.
- *Lack of confidence and trust in consultant companies* -, SMEs sometimes lack confidence and trust in the external consultants' expertise due to past negative experience with such services. Faced with lack of internal expertise, they would hardly go for KM if they do not trust consultants.

III. KNOWLEDGE MANAGEMENT APROACHES

The modern concept on KM appeared at the end of 20th century. Various definitions of KM could be found in the literature: some authors identify it with a process or set of processes [38], [30], others– with a management strategy [37], [27], [39], while third associate it with information technology and a set of processes related to knowledge, information and data [40], [41]. Mertins et al. [10] introduced a practically-based definition, which outlines the most important characteristics of KM: "KM includes all methods, instruments and tools that contribute to the promotion of an integrated core knowledge process – with the following four activities as a minimum, to generate knowledge, to store knowledge, to distribute knowledge and to apply knowledge – in all areas and levels of the organization in order to enhance organizational performance by focusing on the value creating business processes." The emphasis of KM should be on providing benefits to the organization by using all appropriate tools (both 'hard' and 'soft') for managing its knowledge processes and thus supporting its business processes and needs.

A. Knowledge management models and processes

In order to transform knowledge into a valuable organizational asset, knowledge, experience, and expertise must be formalized, distributed, shared, and applied. Knowledge Management is considered a key part of any strategy using expertise to create a sustainable competitive advantage in today's business environment [8]. Many authors have proposed different models for Knowledge Management ranging from 2 to more than 8 different processes. For example, Bergeron [27] identifies: Knowledge creation or acquisition, Knowledge modification, Immediate use, Archiving, Transfer, Translation/repurposing, User access, Disposal. Ruggles [43] suggests only three KM processes: Generation (including creation, acquisition, synthesis, fusion, adaptation), Codification (including capture, representation), and Transfer.

Firestone et al. [42] propose a KM model including two main KM processes:

- Knowledge production – includes knowledge claim formulation, individual and group learning, information acquisition, knowledge claim evaluation, organizational knowledge;
- Knowledge integration – comprises knowledge broadcasting, searching/retrieval, teaching, knowledge sharing, distributed organizational knowledge base.

Mertins et al. [10] developed a reference model for KM based on their studies of KM practice in several companies. The model is composed of three layers (Fig. 1):

- *Value-adding business processes* – They represent the first layer of the model and should be a base for all KM activities, and application area of the knowledge processes.
- *KM core processes* – They are considered as a second layer of Mertins model. Knowledge processes should be integrated into the business processes. Knowledge should be considered as a resource to be applied, an asset to be stored, a product to be generated, and to flow from one process to the other.
- *Design fields of KM* – They form the third layer of the KM model and are derived from the critical success factors for KM found in practical cases. The requirement for control and monitoring of KM processes and their outcomes is important success factor as well.

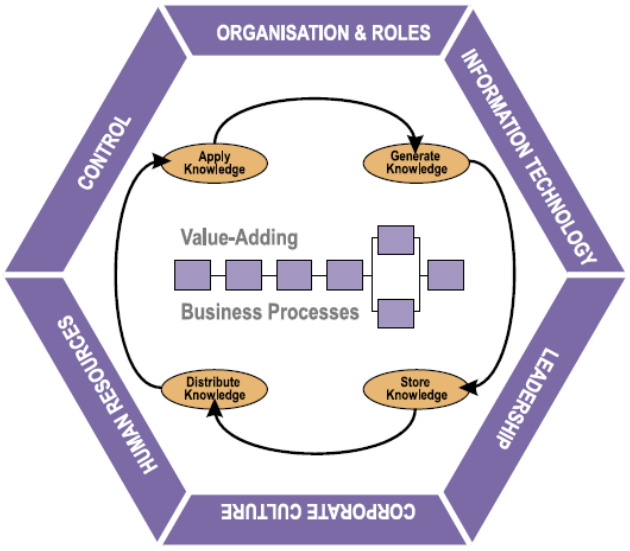

Fig. 1 Core Processes and Design Fields of KM

Probst [32] developed a practically-oriented model for KM aimed at *compatibility* with existing concepts in organizations (such as Total Quality Management and Business Process Reengineering); *problem orientation* (contribution to solution of concrete problems); *comprehensibility* (choosing KM tools relevant to the organizational needs); *action orientation* (KM analysis to lead to focused actions having impact on the organization); and providing *appropriate instruments*.

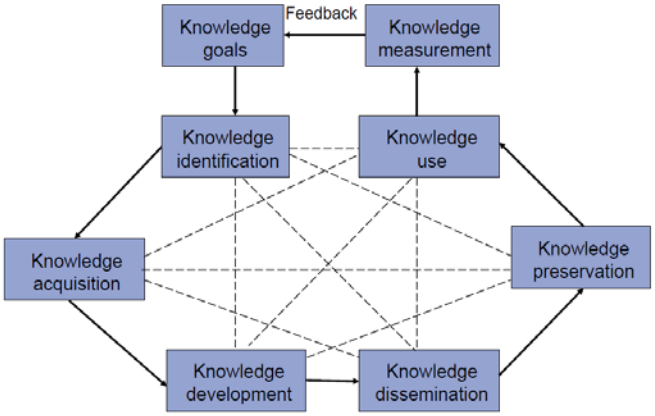

Fig. 2 KM model of Probst [32]

The Probst model presents the interrelation of different knowledge processes (Fig. 2) which come out of the identified knowledge goals. The latter determine the focus of KM and the respective activities for ensuring the knowledge needed in the organization for gaining better business results and higher competitiveness. Probst [32] considers that there are three types of knowledge goals: The normative ones deal with the organizational culture supporting KM. The strategic ones are linked to the desired knowledge and competences in the organization and serve as a base for long-term planning, while the operational knowledge goals focus on everyday activities and processes. An important building block of Probst model is the knowledge measurement which provides a feedback for achieving the stated knowledge goals and objectives, and the effectiveness of the KM strategy. The other blocks of the model include:

- *Knowledge identification:* Before any KM initiative there is a need to analyze available internal and external knowledge, competencies and expertise (both individual and collective). The aim is to ensure better management of existing knowledge in the organization, using all available resources and potential opportunities. It is important also the decision making process to be based on all available knowledge and information.
- *Knowledge acquisition:* After identifying what external knowledge and expertise are needed it should be decided how to acquire them. Possible ways are: acquiring knowledge products (patents, software, etc.), hiring experts, building joint ventures for gaining access to knowledge of other companies, as well as using knowledge of clients, suppliers and other stakeholders through an open innovation process.
- *Knowledge development:* The objective is to manage the creation of new knowledge – new competences, products, processes, new ideas, etc. It could be supported by KM on organizational and individual level. Training and other learning initiatives help individuals to gain new knowledge and expertise, while collective/organizational knowledge creation is supported by integration of individual knowledge through communication, collaboration, team work, etc.
- *Knowledge dissemination:* The main objective is to ensure the necessary knowledge and expertise timely where it is needed. ICTs (e.g. groupware, information systems, Web 2.0 tools, etc.) and social networking via communities of practice or expert teams could support knowledge distribution.
- *Knowledge use*: Knowledge should support business processes and be accessible to employees. Users' satisfaction and utilization of knowledge in the daily work should be in the centre of KM in order to be successful.
- *Knowledge preservation:* The organizational knowledge base should preserve valuable knowledge in order to prevent a 'corporate amnesia' by leaving of employees, reorganization or in case of technical problems.

B. Knowledge management strategies in practice

Hansen et al. [14] believe that two strategies are central for KM practice and organizations should make a choice between codification and personalization strategy (Table II). The *codification strategy* is based on explicit knowledge in generally accessible repositories which could be reused by employees. Knowledge is codified using a "people-to-documents" approach – it is extracted from the person who developed it. In addition, in the repository could be stored and

TABLE II
CODIFICATION AND PERSONALIZATION STRATEGY, ADAPTED FROM [14]

CODIFICATION	Competitive Strategy	PERSONALISATION
Provide high-quality, reliable, and fast information-systems implementation by reusing codified knowledge.		Provide creative, analytically rigorous advice on high-level strategic problems by channeling individual expertise.
REUSE ECONOMICS: - Invest once in a knowledge asset; reuse it many times. - Use large teams with a high ratio of associates to partners. - Focus on generating large overall revenues.	Economic Model	EXPERT ECONOMICS: - Charge high fees for highly customized solutions to unique problems. - Use small teams with a low ratio of associates to partners. - Focus on maintaining high profit margins.
PEOPLE-TO-DOCUMENTS: Develop an e-document system that codifies, stores, disseminates, and allows reuse of knowledge.	Knowledge Management Strategy	PERSON-TO-PERSON: Develop networks for linking people so that tacit knowledge can be shared.
Invest heavily in IT in order to connect people with reusable codified knowledge.	Information Technology	Invest moderately in IT in order to facilitate the exchange of tacit knowledge.
- Hire graduates who are well suited to the reuse of knowledge and the implementation of solutions. - Train people in groups and through computer-based distance learning. - Reward people for using and contributing to document databases.	Human Resources	- Hire MSc graduates who like problem solving and can tolerate ambiguity. - Train people through one-on-one mentoring. - Reward people for directly sharing knowledge with others.

available for reuse different 'knowledge objects' such as: interview guides, work schedules, benchmark data, market segmentation analyses, programming documents, technical specifications, training materials, change management documentation, etc. [14].

The *personalization strategy* relies on face-to-face contacts between organizational members, and focuses on sharing experiences and knowledge directly between them. The main emphasis is on managing expert collaboration and building networks of people. The focus of this strategy is on socialization as a tool for knowledge exchange and on dialogue between individuals. Thus, tacit knowledge is transferred in brainstorming sessions, regular team or expert meetings, but also using groupware technologies like e-mail and videoconferences. Other approaches utilized in practice are transferring people between offices, creating directories of experts, etc. [14].

Greiner et al. [19] studied KM approaches in 11 German and Swiss companies and found out that a codification or personalization strategy is applied by them, the former chosen with the aim of re-using knowledge, while the latter targeted at innovation and development of new customer specific solutions. Generally, practical implementation shows that the mix of both strategies gives worse results then the focus on only one of them [19], [14]. Thus, Hansen et al. [14] suggest that organizations aimed at innovation and developing unique or customized products could have better results using the personalization strategy, while organizations dealing with similar problems, and developing more standardized mature products build their success on codification strategy.

Ribiere et al. [7] point out that innovation has become one of the top priorities for competitiveness and growth of organizations in the knowledge-based economy, and even during the recent financial crisis is considered to be a solution for better performance after the crisis is over. Since knowledge is considered as a catalyst of innovation, the authors propose a knowledge-enabled innovation management system (KIMS) based on the concept of *open innovation*. Ribiere et al. [7] put a strong emphasis on involving external stakeholders together with organization employees in the innovation process, which could be supported by both "traditional" technologies (such as database and data mining tools, expert systems, enterprise resource planning (ERP), artificial intelligence, simulation, etc.), as well as Web 2.0 tools (such as blogging, wikis, videocasting, etc.).

The *open innovation KM strategy* of Ribiere et al. [7] takes into account the market demand, the social needs and recent S&T trends. It relies on the collective intelligence (wisdom) and the diversity of the crowd to offer creative and innovative ideas, which could be internally developed and used by the organization. The open innovation framework has three concentric layers (Fig. 3). In the core of the system is the innovation ecosystem including different actors to be involved in the process. The creativity/innovation zone represents the second layer and is supported by various interactive technologies that allow not only employees to contribute and interact with the idea, but also the various actors of the innovation ecosystem. Technologies like virtual reality, augmented reality, simulation and experimentation are considered to enable a high level of interactivity and interaction with the idea/prototype/product [7]. The third layer, the so called the 'knowledge zone', is supported by a KM system allowing the organization to learn, analyze and facilitate decision making. A combination of various KM technologies could facilitate to capture knowledge gained in the creativity/innovation zone (intelligent agents, content syndication, search engines), to select and organize it (expert systems and taxonomies), store it (database (multimedia) and content management systems), and share it (push technologies, knowledge mapping, awareness system, search engines). Ribiere et al. [7] consider that the proposed KIMS "will lead to the development of innovations that are more likely to be adopted in practice, thanks to involving end users and prospective end users in the design and development of prospective innovations". The organization could benefit also from reduced cost and shortened time of development, and faster learning from its successes and/or mistakes [7].

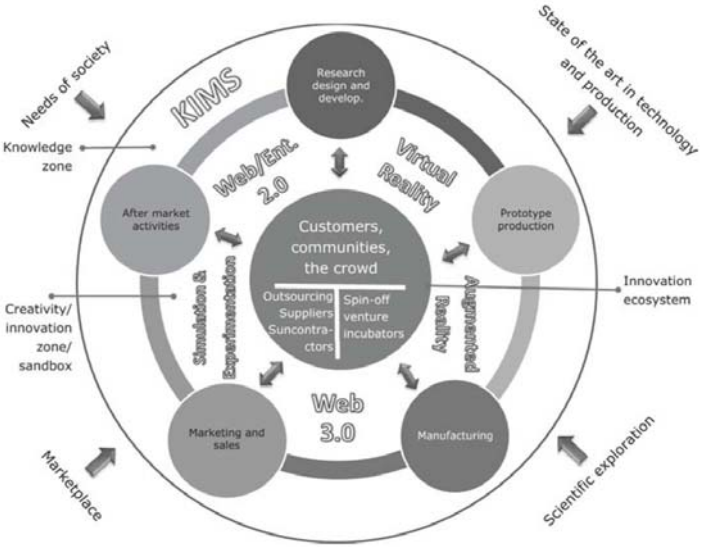

Fig. 3 Framework for knowledge-enabled innovation management system [7]

Similar idea to the open innovation KM strategy of Ribiere is the concept of *Customer Knowledge Management* (CKM) proposed by Gibbert et al. [6], which aims at management of knowledge from customers. Gibbert et al. [6] consider that the traditional KM approaches and the Customer Relationship Management (CRM) systems do not acquire knowledge from customers, which could be beneficial for the organization and support innovation and growth. A comparison of the three approaches (Table III) outlines the main differences, and that the CKM could support organizational learning by gaining knowledge and ideas from their customers. Customer experience, and (dis)satisfaction with products/services could provide valuable information for organizations. Thus, Gibbert et al. [6] consider the need for knowledge sharing platforms and processes between companies and their customers, and based on practical cases, suggest five styles of CKM:

- prosumerism – The idea is that customer could fill the dual roles of producer and consumer. For the companies this could

TABLE III
CKM VERSUS KM & CRM [6]

	KM	CRM	CKM
Knowledge sought in	Employee, team, company, network of companies	Customer Database.	Customer experience, creativity, and. (dis)satisfaction with products/services.
Axioms	'If only we knew what we know.'	'Retention is cheaper than acquisition.'	'If only we knew what our customers know.'
Rationale	Unlock and integrate employees' knowledge about customers, sales processes, and R&D.	Mining knowledge about the customer in company's databases.	Gaining knowledge directly from the customer, as well as sharing and expanding this knowledge.
Objectives	Efficiency gains, cost saving, and avoidance of re-inventing the wheel.	Customer base nurturing, maintaining company's customer base.	Collaboration with customers for joint value creation.
Metrics	Performance against budget.	Performance in terms of customer satisfaction and loyalty.	Performance against competitors in innovation and growth, contribution to customer success.

bring improved products and resulting benefits. The main processes proposed are pre-, concurrent- and post- production integration. (example: IKEA)

- group learning – Providing opportunities to customers for interaction and to share experience and provide feedback for products they used could enrich the corporate social capital and facilitate team learning. Customers could be involved in quality programs, case development, etc. (example: Amazon.com)
- mutual innovation – Customers could become co-innovators and co-developers of custom products. Idea fairs, brainstorming, customer incubation are processes which could support the open innovation process. (example: Silicon Graphics)
- communities of creativity - Communities of creation are groups of people who work together over a long period of time, have an interest in a common topic and want to jointly create and share knowledge. As a CKM style it is reflected by the process of putting together customer groups of expert knowledge that interact not only with the company, but importantly also with each other. (example: Microsoft, eBay)
- joint intellectual capital – Instead of just co-producing products and services together, customers and company co-create future business together (example: Skandia Insurance and Kooperativa Fo¨rbundet).

IV. DEVELOPING KM STRATEGY

KM is a process of continually managing knowledge of all kinds and requires a company wide strategy which comprises policy, implementation, monitoring and evaluation. KM strategy should ensure that knowledge is available when and where needed and can be acquired from external as well as internal sources. Subsequently, the main goal of any KM strategy is to help the organization to achieve its corporate strategy and goals. KM strategy should be rooted in the context of the organizational strategy. KM strategy begins with establishing 'who', 'what' and 'why' is doing. 'How' can then be supported by technology once the above characteristics have been established, if technology is required at all.

In order to prepare its KM strategy the organization need to be aware of its available resources [26], [34]:

- Which knowledge is unique and valuable.
- Which knowledge processes are linked to unique and valuable expertise and competencies.
- How these knowledge resources and competences support the organizational market position.

Thereafter, the knowledge needs should be identified:

- What knowledge is needed for a given product or market position.
- What kind of knowledge should be ensured for technologies, products, customers, market and industrial trends.

The strategic choice of the organization for its future development determines:

- What the organization and its employees need to know in order to be competitive.
- What kind of knowledge should be developed within learning and innovation processes.

The KM implementation follows a number of steps, which have slight differences according to the various authors [8], [25], [26], [27]; however, some important elements are always in place [3]:

- First, by preparing a KM strategy a clear link to the business strategy should be established in order to close the strategic knowledge gaps of the company and utilize the knowledge resources in a more efficient way in order to gain benefits against competitors.
- A knowledge audit is a standard way for examining the knowledge resources and flows within the company, and a sound bases for the subsequent KM action plan.
- An analysis of the existing company infrastructure provides also the necessary ground for building the KM system, and integrating it into the already existing one.
- Permanent evaluation and control are important elements for the proper KM implementation, as well as the training and learning of the staff as KM is a large company change program.

A. Aligning knowledge management strategy with the corporate strategy

For any organization in order to succeed in KM implementation, it is essential to base its strategy on its corporate strategy [25], [26]. Here, a clear understanding of the present state of the organization is necessary, as well as of the

work needed for achieving its business objectives, the skills, competences and knowledge presently available and needed for reaching the business goals [1]. This is considered as filling-in existing knowledge gap (what the organization should know and what it does know) in order to bridge the recognized strategic gap (what the organization is doing and what it should be doing) [27], [28].

TABLE IV
MANAGERIAL KNOWLEDGE PORTFOLIO [31]

	Existing	Potential
STRATEGY	STRATEGIC FIT Where and How is competing now? Requires ideas about: - current market performance; - competitive environment - customer perceptions of value - customer environment; - customer needs - shareholder expectations; - the match between this information and the internal competency profile.	STRATEGIC POTENTIAL Where is going to compete in the future? Requires ideas about: - how to take advantage of future market opportunities - how technology might facilitate new product/process developments; - what currently untapped resource or competencies will enable the business to meet these opportunities etc.
OPERATIONAL PROCESSES	PERFORMANCE MANAGEMENT How well are delivered to strategic objectives? Requires ideas about: - how the organisation is currently operating in terms of core processes, performance, objectives, standards, levels and achievements technical issues, key relationships, etc.	PERFORMANCE DEVELOPMENT AND POTENTIAL How to enhance current or future operational performance? Requires ideas about: - how the organisation could operate differently to be able to deliver competitive advantage in the future; e.g. product and service improvements and new developments

Bailey et al. [31] recommend focusing on four areas in order to gain benefits from KM implementation – existing and potential strategy, existing and potential performance (Table IV). Thus, the business processes and their effectiveness should determine the strategic choices to be taken.

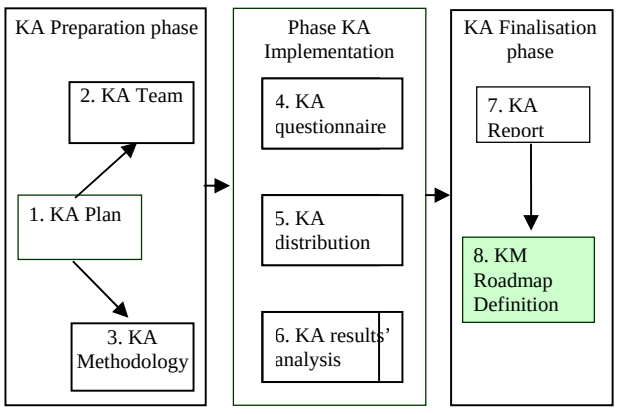

Fig. 4 KA phases and processes

B. Knowledge audit

The KM implementation should be based on KM strategy and action plan. However, in order to prepare them, it is necessary to identify knowledge assets and knowledge work in the organization, making them visible for any KM initiative [1]. The concept of KA (sometimes referred to as knowledge inventory or knowledge assessment) largely varies in research and business practice [36], [34], [35], [12]. KA aims to investigate the company status at a given moment regarding knowledge availability and future needs, knowledge flows and sharing among employees, knowledge usage in business processes for adding value to the organization, etc. [1].

Taking into account the variety of KA approaches found in research and practice [1], [8], [29], [35], [36], [44], could be suggested a three phase KA (Fig. 4) [1], [4]:

- The first phase defines the main parameters of the Knowledge Audit:
  - Planning of its scope, activities and time schedule
  - Selecting the right Knowledge Audit Team plays an important role for the KA outcomes
  - Methodology how to perform and implement successfully specific KA tasks, techniques and activities.
- The second phase is related to the actual KA implementation:
  - How to select, compose or adapt KA Questionnaire according to specific company needs
  - Methodology for KA distribution (via e-mail, paper or electronic questionnaires, conducting interviews, mixed approach), and notification of the target audience
  - Analyses of the KA results, testing and verifying hypothesis based on the collected quantitative and qualitative data. First feedback of the results.
- The third phase is KA finalization:
  - Preparation and presentation of meaningful KA Report as the major outcome of KA
  - KM Roadmap consideration.

The Methodology for implementing Knowledge Audit should be adapted to the specific situation in the organization. It should reflect not only the company status and profile, but also some constraints like cost, time, and staff. At the same time, it should produce and guarantee the desired Knowledge Audit outcomes. The Knowledge Audit team has to discover the most convenient among the existing Knowledge Audit methodologies and techniques (Table V), depending on the desired outputs and management practice [4], [12].

C. Monitoring and control

In order to provide the necessary background for strategic planning as well as to monitor and control future strategy implementation, it is important to integrate in the process suitable key performance indicators (KPI). In strategic management, for measuring the performance of organizations are used a number of recent approaches such as Balanced Scorecard (BSC) of Kaplan and Norton, Six Sigma, etc. [1]. For example, Kaplan and Norton [9] provide an approach for linking strategic planning with performance measurement, which gains popularity in last few years. Their BSC

TABLE V
KA METHODS AND TECHNIQUES [12]

Knowledge surveys	to provide tangible evidence of the enterprise's knowledge-related strengths, weaknesses, opportunities, threats, and risks
Intellectual Capital (IC) Inventorying	to identify, locate, and assess knowledge and IC assets, and on this base set priorities and identify action needs
Knowledge Landscape Mapping	to determine initially KM practices, programs, projects, infrastructure elements, policies and procedures, etc., and on a later stage monitoring them
Creating Knowledge Maps	to indicate locations, sources, representation and nature of knowledge assets, flows of knowledge and its application in business processes
Competitive Knowledge Analysis	to identify areas of expertise and important IC assets providing competitors strengths and opportunities
Knowledge Flowcharting and Analysis	to improve knowledge flows on bases of identification of existing paths, means of knowledge flows between individuals, groups and in the organisation as a whole
Knowledge Diagnostics	to understand knowledge-related mechanisms and processes in order to analyze situations and to conceptualize KM interventions and actions, both at individual, group and organisational levels
Critical Knowledge Function Analysis	to identify critical operational, professional or managerial functions, and determine the potential value of their knowledge-related improvements;
KM Benefit Assessment	to consider potential effects of KM initiatives as a base for planning, action, and monitoring of KM implementation.

methodology evaluates four main different perspectives: Financial, Stakeholders, Internal processes, and Learning and Growth [9]. When implementing BSC methodology for the purposes of KM, by developing the steering perspectives are analyzed both, the main internal and external aspects of the organization and on this base are defined strategy objectives for each perspective and developed cause-and-effect chains between the objectives. Keyes [45] considers that the BSC methodology could be adapted successfully also to KM performance measurement including a new aspect – the strategic management of IT (Fig. 5).

It is generally accepted that measurement of intellectual capital, and subsequently knowledge assets, creates large difficulties. On bases of survey of measures used for intellectual capital measurement, Liebowitz et al. [16] consider some quantitative measures which could be used also in KM measurement. As possible new metrics are proposed [16]:

- number of new colleagues relationships
- reuse rate of knowledge
- capture of new expertise (number of new concepts) from knowledge repositories
- number of new ideas generating innovative products or services
- number of lessons-learned and best practices applied to create value-added
- number of new knowledge created per employee (including patents, trademarks, articles, books written, conference talks, etc.)
- investments for professional development/ training and R&D per employee.

KM metrics should involve both, qualitative and quantitative measures focused on supporting the organization to [1]:

- help make a business case for implementation
- help guide and tune the implementation process by providing feedback
- provide a target or goal
- measure, retrospectively, the value of the initial investment decision and the lessons learned
- develop benchmarks for future comparisons and for others to use
- aid learning from the effort and develop lessons learned.

Generally, in KA dominate qualitative methods for collection of data needed for the analysis. For example, the following tools are used in KA moving across multiple levels (individual, team, department, organization) [1]:

- questionnaires for collecting data
- interviews for in-depth analyses of problems
- focus groups
- observing the work in progress
- obtaining network traffic logs, policy documents, org charts, process documentation
- exploring common and individual file structures
- narration techniques for in-depth analysis of knowledge and its context-relations.

Usage of semi-structured interviews with leaders and key stakeholders is one tool providing good results in identifying KM needs and opportunities. Open-ended interview provide a good opportunity to gain additional insights and understand perceptions of employees, and deepen them with individual interviews or focus group discussions.

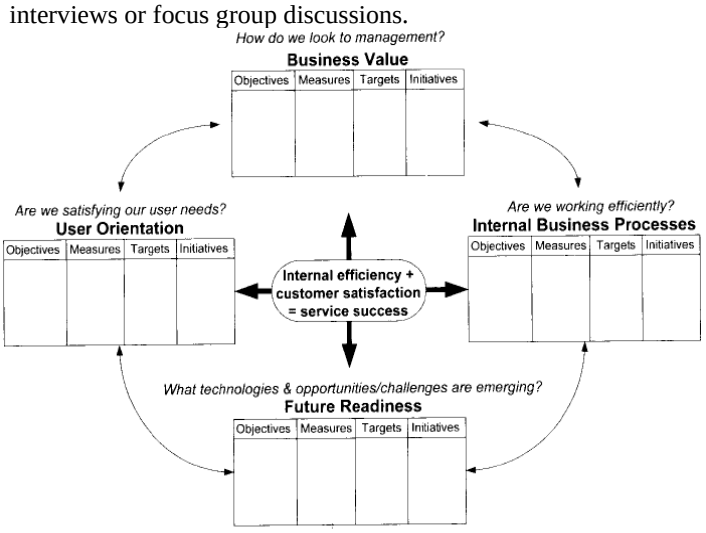

Fig. 5 IT balanced scorecard [45]

D. Factors for success of KM implementation

It is quite obvious that without a strong leadership and commitment by the company management, a KM initiative could hardly start and succeed. However, for its successful implementation a number of factors imply. Several authors

[10], [27], [30] have identified success factors in implementing KM in organizations. The most important ones are [3]:

- Knowledge-oriented corporate culture
- Continuous learning and knowledge sharing
- Technical/ organizational infrastructure
- Senior management commitment and leadership
- Knowledge champions, such as chief knowledge officers
- Link to economics or industry value

Technology plays a vital role as well, however, a successful KM implementation should be focused not only on technology, but on first place, on human and organizational issues [5].

Taking into account the specific characteristics of SMEs outlined above, some important actions could be suggested in order to ensure KM success:

- Convincing leadership in KM benefits for the organization in order to ensure their full support in this change process. Examples of best practice backed with financial benefits estimations could help.
- Raising awareness of employees at all levels on KM by:
  - Initiating public discussions for the reasons, needs and benefits of the KM implementation within SMEs;
  - Addressing the need of management approaches to cope with timely and quality information and knowledge flows.
- Developing a practical KM approach which reflects the organizational and cultural aspects and is coherent with the business processes and goals.
- Aligning all KM activities to business strategy in order to ensure an added value for the organization. Creating a short-term and visible impact of the KM program could overcome resistance and gain further support for KM.
- Ensuring non-financial and, if necessary, financial benefits to motivate employees and commit them to the whole Knowledge Management initiative.

V. Conclusion

SMEs could not compete with large organizations in terms of tangible resources (capital, labor, technology and physical infrastructure), however, knowledge is an invaluable resource which could provide them many benefits, if properly acquired, stored, used and leveraged. Therefore, KM might offer SMEs many benefits and become a powerful tool for success, if properly utilized and aligned with the business strategy.

The paper proposes some strategies for KM to be considered by managers of SMEs. Their choice should be based on the real situation in the organization and a careful analysis of business needs, and knowledge availability and use. Taking advantage of available best practice described in different case studies could provide SMEs managers with further insights on KM successful approaches. The paper does not prescribe how to succeed in KM implementation, however, outlines the essential factors which could lead to good results. It is important to underline that knowledge resides in human minds, and therefore, a people-centered approach could give the best results.

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