KNOWLEDGE STRATEGY, ITS CONTENTS AND CREATION

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One of the basic tasks of a business strategy is to ensure, among other things, the maximum use of all of an enterprise's resources. In the 21st century, one of the most important resources with a continuously increasing influence on an enterprise's results is the enterprise's knowledge. In order to make its acquisition and use as cost-effective as possible, the knowledge strategy of an enterprise must be defined. The core of this paper is the description of a new methodology for creating such a strategy. This methodology has been designed to enable both the easiest possible implementation in practical conditions and the most effective use of the knowledge strategy in supporting the creation and implementation of business strategy.

KEYWORDS

knowledge strategy, knowledge management, knowledge factors, knowledge resources, knowledge processes, business processes, business strategy, corporate culture, evaluation metrics, knowledge infrastructure

1. INTRODUCTION AND MOTIVATION

In order to remain competitive in today's global economy, to survive in conditions of constant and unpredictable change while maintaining growth, or even to avoid existential problems, an enterprise must develop its activities in accordance with its business strategy [7]. The strategy sets the basic parameters for the enterprise's activities in the near future and at the same time provides the basis for the sub-functional strategies that the enterprise must update and implement for that period. The list of these strategies varies and depends on a number of factors, but in the twenty-first century, the knowledge strategy (see Figure 1), is unquestionably one of the essential strategies for an industrial enterprise. It sets out the main tasks, activities and metrics for the management of the specific and most valuable resource with which the enterprise is endowed, which is knowledge.

Fig. 1 – Relation of knowledge strategy to other functional strategies [2]

However, the enterprise's knowledge strategy has a specific position among other sub-functional business strategies not only in that it intertwines and practically connects most of them, but also in that it clearly defines the basic knowledge factors and their necessary further development, which is crucial for meeting the enterprise's strategic objectives [5]. Thus, the purpose of developing a knowledge strategy is to analytically ground the "hardening" of the business strategy and to reduce the influence of its subjective or random components.
The authors of the new methodology have therefore attempted to address these three basic issues simultaneously:

a) Define what is the purpose of a knowledge strategy for an industrial enterprise and its basic contents

b) Create a new, relatively easy to implement methodology for its creation

c) Design this methodology so that it also serves as a permanent knowledge tool to support the creation, evaluation and updating of the business strategy.

2. OVERVIEW OF THE CURRENT SITUATION

2.1 Definition of knowledge strategy

Researchers have not yet agreed on a single definition of the concept of knowledge strategy, but some good suggestions have been made. Usually, the strategy is still characterized from a perspective that mainly follows the type of organization; for example, the frequent division of knowledge strategy into codification and personalization strategies [2]. However, a unified definition of knowledge strategy is still missing, even in the global literature. Below are two definitions of knowledge strategy taken from the literature:

"A knowledge strategy that supports the business strategy identifies the individual knowledge activities that will support the achievement of the business goals and objectives of knowledge management." [3]

"A knowledge strategy is a process for managing knowledge effectively, how to use it rationally in order to save costs, permanently reduce the duration of business

processes, increase flexibility and, as a result, increase competitiveness." [4]

For the purpose of this paper, knowledge strategy is defined as "*the determination of the final state of the knowledge base in the enterprise necessary to meet the enterprise's objectives and the associated purposeful and controlled process to achieve a new state of knowledge while not exceeding the allocated resources and keeping risks at an acceptable level.*" This definition was developed by the authors of this article. The knowledge strategy must support the business strategy and the existing core capabilities of the enterprise in all respects.

2.2 Building blocks of a knowledge strategy

Different authors define the content of an enterprise's knowledge strategy in different ways, but there is considerable agreement on its basic building blocks. These include in particular [3]:

- Objectives of knowledge strategy,
- Definition of knowledge support requirements,
- The basics of knowledge management organization,
- Knowledge resources and processes,
- Knowledge infrastructure,
- Basic metrics in knowledge management,
- Motivation for knowledge management,
- Basic knowledge management documentation,
- Information and Knowledge Systems Synergies

Although most of the literature provides a definition or definitions of knowledge strategy, its (at least indicative) content is not defined. The authors of this article based their proposal on general knowledge of strategic management, published analyses in the field of knowledge management and their own knowledge of business practice in this area.

2.3 Current level of knowledge systems

Knowledge-based systems differ from information-based systems in that they additionally contain a knowledge base and a procedure for working with it. Both types of systems are constantly evolving, and progressive companies are already talking about and working on creating 5th generation knowledge systems. The basic pillars of their architecture remain the available technology, efficiently set knowledge processes and the human factor with its competences and links (see Figure 2).

Table 1. Five generations of KM4D.

1: ICT-based	2: Organization-based	3: Knowledge sharing-based	4: Practice-based	5: Development knowledge system/ecology
Identifying concepts				
Knowledge as a commodity	Knowledge as an asset within organizations	Knowledge sharing between organizations	Knowledge processes embedded in organizational processes	Cross-domain knowledge integration and knowledge co-creation
Features				
ICTs Databases Portals Clearinghouses	KM audits KM scans Explicit and tacit knowledge	Peer assist Case studies 'Best practices' Inter- organization communities of practice	Role of social media People-centric Practice-based	Multiple knowledges Multi-stakeholder processes Global public good and knowledge commons Emphasis on local knowledge Emergence and complexity

Fig. 2: Five generations of KM4D [9]

However, not all enterprises are at the level of the 5th generation of knowledge systems. The proposed methodology is therefore universal and thus applicable regardless of the state of implementation of corporate knowledge management in the enterprise [8]. It is based on the assumption that the enterprise has decided to implement this management subsystem and that at least a basic knowledge mapping has been carried out. This is usually carried out according to basic divisions – explicit knowledge in the form of directories of knowledge and knowledge works (knowledge maps) and tacit knowledge in the form of a directory of references to relevant experts - knowledge workers (or their profiles).

The authors naturally have experience in the analysis of previously proposed methodologies (e.g. KM-Beat-It, KM Toolkit A. Tiwana, Standardized KM, APQC Road Map, On-To-Knowledge, Know-It, etc.), but practice shows that if enterprises build their own enterprise knowledge management systems, these methodologies are usually not used, as they are too complicated.

The main task of the new methodology is to create an easy-to-implement proposal for a new knowledge strategy based on a comprehensive picture of the current state of knowledge in the enterprise and knowledge of its basic strategic goals or objectives. This should also include the assignments and impulses for the basic parameters of the corporate knowledge management system. The new and central element of this methodology is the fact that it is not only about creating a new type of strategy, but creating a procedure for the creation of this strategy in such a way that it also contributes significantly to supporting the creation and implementation of the basic strategic document - the business strategy [4]. This task also stems from the knowledge of corporate practice, which identifies it as a priority reason for the application of knowledge management.

3. DESCRIPTION OF THE METHODOLOGY OF PERMANENT KNOWLEDGE SUPPORT FOR THE CREATION, EVALUATION AND UPDATING OF BUSINESS STRATEGY AND FUNCTIONAL STRATEGIES

3.1 Initial analyses and summaries

3.1.1 Analysis of the basis of business strategy

The basic starting points of both business and knowledge-based strategies are [1]:
(a) vision - whether the proposed vision sufficiently corresponds to the anticipated global developments in the sector and whether it is sufficiently attractive and motivating for employees and all other stakeholders,
(b) mission - whether the proposed mission focuses on the right use and development of appropriate technologies, the appropriate use and development of human resources, and the right market segments and customer types,
(c) shared core values - whether these are still valid or need to reflect the current evolution of societal values.

3.1.2 Summary of global corporate objectives

The result is not only a clear list of the basic strategic objectives of the enterprise, but also other outputs (often referred to as critical knowledge) such as [10]:

(a) knowledge of customers and their needs - building customer trust in the enterprise, long-term customer satisfaction with the enterprise's products and services,

b) knowledge of the market and its possibilities - need and consumption of individual commodities, estimation of expected technological development of given commodities, distribution and service possibilities,

(c) knowledge of main competitors and business partners - quality of their products/services, their intentions for further investment and reorganization plans.

3.1.3 Summary of the objectives of functional business strategies

Specific objectives are gathered from the business strategy, focusing on the individual functional strategies of the industrial enterprise:
- financial strategy objectives
- production and R&D strategy objectives
- marketing strategy objectives
- objectives for the human resources management strategy; this step also includes objectives for the corporate culture and identity.

3.1.4 Summary of key performance indicators

Key Performance Indicators (KPIs) form the basis for monitoring whether the growth of the knowledge base is aligned with the execution of the business strategy. The primary task of management is to select KPIs that are expected to be critical to the enterprise over the lifetime of the enterprise strategy. The current and desired status of each KPI is taken from the business strategy for further action. However, the number of KPIs must be limited so that they can be monitored by the majority of the enterprise's employees.

3.2 Mapping the current state of knowledge in the enterprise

3.2.1 Analysis of information and knowledge infrastructure and ICT applications

Its aim is to identify the level of ICT applications and information and knowledge infrastructure of the enterprise, how effectively these support internal knowledge work and how they are able to support the growth of knowledge quality and its use for further development of the enterprise.

3.2.2 Analysis of knowledge sources

These are content resources divided into artefacts (guidelines, process descriptions, technical reports, etc.) and participants (employees at all levels). The aim is to find out what knowledge is available in the enterprise, at what level it is, where it can be used and where it is located [1]. For each resource, a list of knowledge (knowledge areas) and the necessary classification will be provided. This step identifies the knowledge areas where it is clear that the strategic potential for developing core competencies and creating competitive advantage is maximized. Their identification is based on the past achievements of the enterprise, but also includes a prediction of the future development of the enterprise. Core competencies (knowledge areas) are always understood in a corporate context, which makes it difficult to copy competitors.

3.2.3 Analysis of knowledge processes

The aim of this analysis is to find out what knowledge processes currently exist in the enterprise and how effectively they work, how they influence each other and how they cooperate. It should also map the entire knowledge lifecycle management process from its creation or acquisition to its replacement with new knowledge or its disposal. This area is now fairly well researched and described, with problems remaining perhaps only in the area of transfer and use of tacit knowledge [6].

3.2.4 Analysis of key enterprise processes

The aim is to identify key processes that are value-creating and are a source of competitive advantage. However, it is also useful to identify any poor quality in the enterprise's key processes and in their interaction, such as duplication of activities, unnecessary activities, downtime, waste of resources, unclear responsibilities, or incorrect interconnection of processes. If the analysis of

business processes reveals that they are poorly defined or interconnected, they must be defined and described, otherwise their quality cannot be effectively improved. Here it is advisable to align the business process adjustment and change programme with the knowledge management processes. We assume that for each industrial enterprise of a selected size at the SBU (strategic business unit) level, the following seven key business processes will be analysed [1]:

- Resource management
- Benchmarking competitors
- Performance management
- Employee development management
- Innovation management
- Sales and partner network management
- Customer relationship management

3.2.5 Analysis of corporate culture from a knowledge perspective

The aim of the analysis is to identify and evaluate which attributes of corporate culture support knowledge management in the enterprise and which do not. Although this is a rather demanding activity, the benefits of which we cannot yet quantify sufficiently, clear shifts in this area are clearly reflected in the final results of the enterprise and therefore this area of analysis cannot be omitted or merely formally carried out.

3.2.6 Summary of the state of knowledge in the enterprise and SWOT analysis

This is specific to each particular enterprise. Nevertheless, we consider it possible to generalize the main focus of strengths/weaknesses and opportunities/threats as follows:

a) strengths (knowledge contributing to the development of core competencies and creation of competitive advantage) - internal know-how, knowledge about the market, competitors, subcontractors, business partners and customers including their intentions, knowledge about key processes in the enterprise,

(b) weaknesses - insufficient level of knowledge, missing key knowledge, inefficient information and knowledge system, poorly functioning knowledge processes, insufficient professional quality and experience of employees, unwillingness to cooperate and share knowledge,

c) opportunities - possibility to acquire knowledge (upgrade existing knowledge) from outside the enterprise (including the use of scientific potential of universities), investment in appropriate knowledge, appropriate upgrade of information and knowledge system, possibility to obtain experts from competitors,

d) threats - competitors' ability to better use knowledge to create competitive advantage, late registration of major changes in markets or technologies, mispredictions of knowledge needs.

3.2.7 Predicting the development of customers, markets and technologies

Taking into account the prediction of global developments, the enterprise's own studies and benchmarking of competitors and business partners, the expected trend (growth, stagnation, decline) of their importance for each market segment, customer group and technology will be determined for the period of validity of the business strategy and the long-term trend. This prediction is intended to facilitate future strategic decisions on the future direction of the enterprise and the use of its resources.

3.3 The process of knowledge strategy development

3.3.1 Definition of the required state of knowledge

At this stage, knowledge areas relevant to the enterprise are confirmed or corrected. The main objective is to predict the desired target state of knowledge in the enterprise and its expected use at the end of the knowledge strategy's validity - i.e. the state obtained by developing existing knowledge (explicit and tacit), purchasing knowledge from the external environment and their mutual integration. Usually, the enterprise's own prediction of the development of markets and technologies, created by the enterprise's management, and benchmarking of main competitors and business partners, or information about the state of their knowledge and the directions they intend to take in further development and acquisition of knowledge, are used to define the end state of knowledge [1]. Looking beyond traditional markets, customers and technologies is essential for a knowledge strategy - to enable the enterprise to react in time to possible impending disruptive change.

3.3.2 Definition of the difference between current and target state of knowledge

This is obtained by comparing the desired state of knowledge with the results of analyses of its current state. For key knowledge that is essential for the enterprise, the following factors must be taken into account or their status at the beginning and end of the knowledge strategy must be defined [2]:

- **Valuation** - the importance of knowledge can change during the validity of the knowledge strategy. It can grow or decline as the market segment grows/declines and therefore the interest of customers in products/services of a given type also grows or declines. It is necessary to

simulate the trend of change in the importance of knowledge and from this to derive the expected consumption of resources over time for its further development.

- **Codifiability** - due to employee turnover and retirement, it is necessary to strive for maximum codifiability of all relevant knowledge (growth of the explicit knowledge component) in the form of expert reports, procedures, analyses and computer programs to be stored in an appropriate place in the information and knowledge system.

- **Extensibility** - the desired extension of the use of key knowledge needs to be specified. The extent to which the knowledge is used in the various departments of the enterprise and subsequently in innovation is used to define it.

3.3.3 Choosing pathways to achieve the desired state of knowledge

The knowledge strategy must specifically define how to obtain the missing knowledge and how to update or remove insufficient or outdated knowledge from the system. This process takes place along technological, geographical and social dimensions and is essential for decision making. The following pathways are available:

a) knowledge gained through in-house development (exploitation) - if the in-house team of specialists is found competent to carry out the necessary development in an acceptable time and at an acceptable cost, and the risk of blind development paths and 'teething troubles' is also acceptable. The advantage of this approach is the possibility to create new knowledge (or update outdated knowledge) exactly according to the conditions in the enterprise and its context. This reduces the chance of competitors copying it.

b) knowledge acquired from outside the enterprise (exploration) - if the enterprise is not able to acquire new knowledge on its own or the risk of internal development is too high, it is possible to acquire new knowledge e.g. in the form of a licence (however, here there is a risk that the purchased knowledge will not be fully usable in the enterprise), through acquisition, merger or creation of a joint venture with another enterprise. Even here the complex internal knowledge transfer process cannot be avoided.

(c) Knowledge acquired through a combination of (a) and (b) - here the aim is to take advantage of the synergies between the two.

3.3.4 Proposal of metrics for knowledge strategy evaluation

Metrics for evaluating business performance and business processes and metrics for evaluating the success of the knowledge strategy need to be aligned. Metrics for evaluating the state of knowledge (mostly qualitative) in the enterprise can be divided in terms of [1]:

a) customer – the metrics map the state of knowledge about customers (their problems, wishes and intentions), the level of communication with them, customer satisfaction and trust. An example of a metric is measuring customer satisfaction and changes in customer behaviour.

b) enterprise processes and processes in the supply chain - the metrics map the level of rationalization of internal processes in the enterprise, the degree of redundancy, the transparency of processes, the level of rationalization of processes in the members of the chain and the level of their cooperation. An example of a metric is the measurement of process transparency and redundancy in processes.

c) innovation – the metrics map the contribution of knowledge in product/service and process innovation and the effectiveness of knowledge processes in addressing specific challenges arising from the process of such innovation. An example of a metric is measuring the number of knowledge-based innovations and the financial contribution of such innovations.

d) employees and management – the metrics map the development of employees' personal knowledge and competencies, growth in the level of motivation and teamwork, and growth in employees' involvement in solving enterprise problems. An example of a metric is measuring the level of employees' knowledge and their involvement in solving enterprise problems.

The specific metrics will depend on the type of enterprise and the type of its products/services and must map the gradual growth of the enterprise's knowledge base in line with the gradual implementation of the enterprise strategy.

3.3.5 Selection of projects, activities and programmes

At this stage, the final form of the knowledge strategy is fine-tuned in the form of concrete projects resulting from knowledge activities, programmes and plans. In defining these projects, it is important to agree on priorities in terms of the implementation of the business strategy (i.e. when the required quality of certain knowledge should be available). Projects are specific to each enterprise, often running partly or fully in parallel, and have different forms, duration, focus or resource requirements. Their aim is to change the current state of knowledge in the

enterprise and then apply it progressively to the current business strategy to update it. The proposed metrics are also tuned to sufficiently reflect the impact of specific projects on the planned growth of the corporate knowledge base. An overall view of knowledge strategy development is shown in Figure 3:

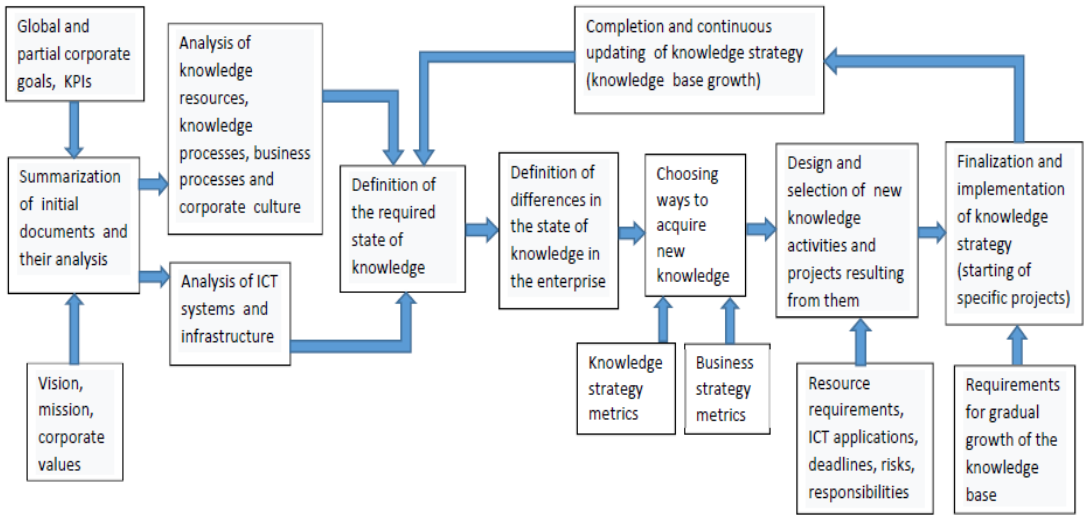

Fig. 3: Detailed diagram of knowledge strategy development [1]

3.3.6 Implementation and continuous updating of the knowledge strategy

In today's environment of constant change, knowledge strategies must be as adaptable as possible to unexpected changes. All key attributes of a knowledge strategy must be constantly benchmarked against the current state of markets and technologies, the upcoming moves of major competitors and the actual results of implementing workable business strategies [1]. During the usual five years of a knowledge strategy, major changes may occur in all aspects of the strategy:

- Final state of the knowledge base
- Ratio of human and technological approaches to working with knowledge
- Proportion of knowledge acquired inside or outside the enterprise
- How knowledge is acquired outside the enterprise (licensing, acquisitions, mergers, joint ventures, collaboration with universities, etc.)
- Knowledge strategy metrics and indicators
- Knowledge management activities and resulting specific projects, including their linkage to support the implementation of the changing business strategy

All of these possible changes, as well as the gradual growth of the enterprise's knowledge base resulting from the implementation of knowledge strategy projects, have an impact on the target state of the knowledge base and must be continuously reflected when updating it in terms of future innovations and when updating the business strategy [9].

At the same time, it is necessary to continuously update the budget, responsibilities, requirements for additional resources, infrastructure and ICT applications and manage the risks associated with the implementation of the knowledge strategy.

3.4 Synergy between business and knowledge strategy

3.4.1 Balanced scorecard for business and knowledge strategy

For the integration of the business and knowledge strategy, we foresee the use of the Balanced Scorecard method, which will be defined for all standard perspectives of both strategies - financial, customer, process and learning/growth. The goals and objectives, metrics, target values and initiatives leading to the achievement of the goal and budget (for the enterprise strategy also KPIs) will be defined for both the enterprise and the knowledge strategy. The use of the Balanced Scorecard method is necessary for the enterprise to have a concrete meaning:

- Select appropriate metrics for the execution of the business strategy based on KPIs (the effectiveness of the proposed initiatives is linked to this)

- Establish workable links between KPI growth, business objectives and initiatives to achieve their target state

- Select appropriate knowledge strategy performance metrics based on enterprise strategy performance metrics

Defining KPIs and linking them to enterprise goals, performance metrics, performance initiatives and the approved budget is central to the enterprise.

3.4.2 Strategic map linking business and knowledge strategy objectives

Subsequently, a map will be created showing the interconnection of the objectives of both strategies - or their links across all the above perspectives. This linkage allows for the appropriate adjustment of business processes, resources and organizational structure to achieve these objectives. The map is specific to each enterprise and is difficult to present in a generic form [1]. Therefore, for the purpose of this paper, this map has been created for a specific enterprise (see Figure 4).

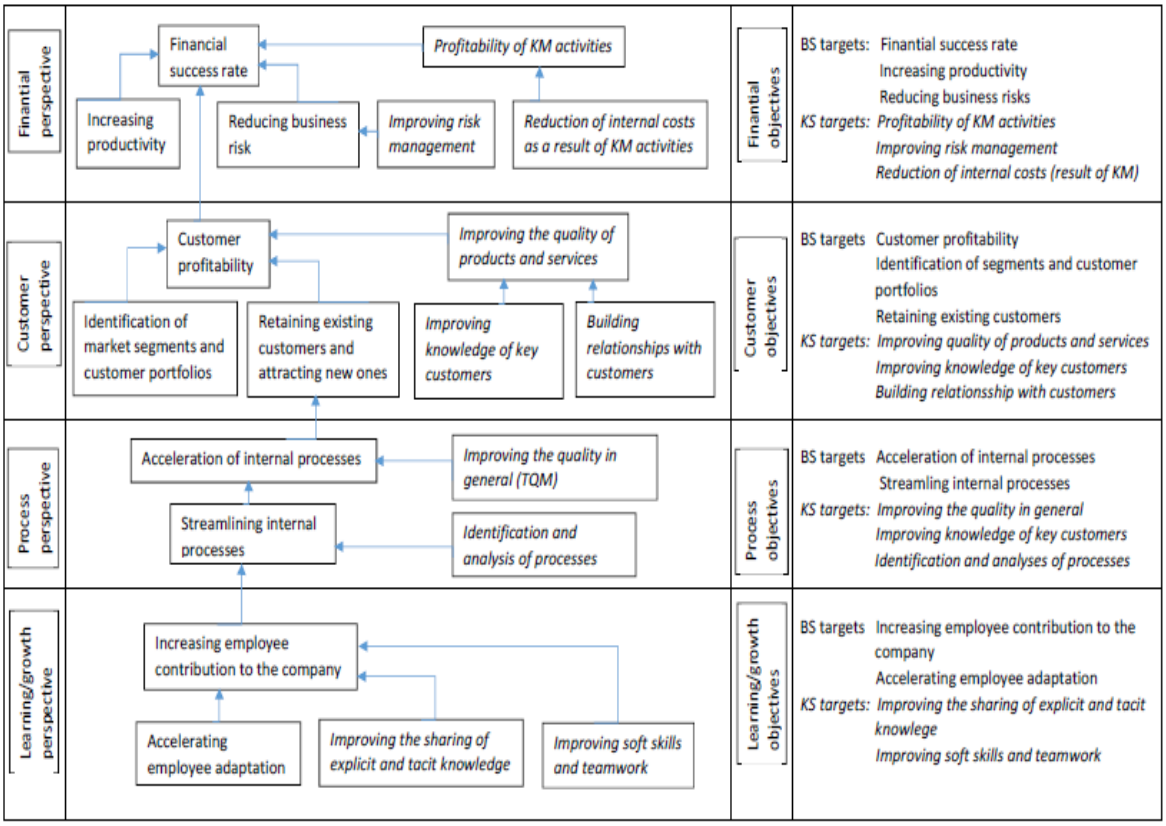

Fig. 4: Map linking business and knowledge strategy objectives [1]

3.4.3 Monitoring the ongoing achievement of the objectives of both strategies

At this stage, the final form of the knowledge strategy will be fine-tuned and subsequently implemented in the form of specific projects resulting from the knowledge activities, programmes and plans described in chapter 3.3. Their aim is to change the current state of knowledge in the enterprise and gradually implement them into the existing business strategy [8]. At the same time, the proposed metrics are fine-tuned to sufficiently reflect the impact of the implementation of specific projects on the planned growth of the enterprise's knowledge base.

During the implementation of both strategies, the fulfilment of their objectives is continuously monitored using a fulfilment timetable. In the event that the planned milestones are not achieved, linking the objectives of both strategies enables the effective initiation of the necessary changes in the enterprise. The knowledge strategy has to be updated if the implementation of the functional strategies shows insufficiently rapid growth of the knowledge base or an insufficient level of the target state of knowledge. At the same time, changes in corporate objectives resulting from unexpected changes in markets and technology must be reflected in the updating of both strategies.

3.5 Overall scheme of the proposed methodology

The whole methodology is summarized in Figure 5.

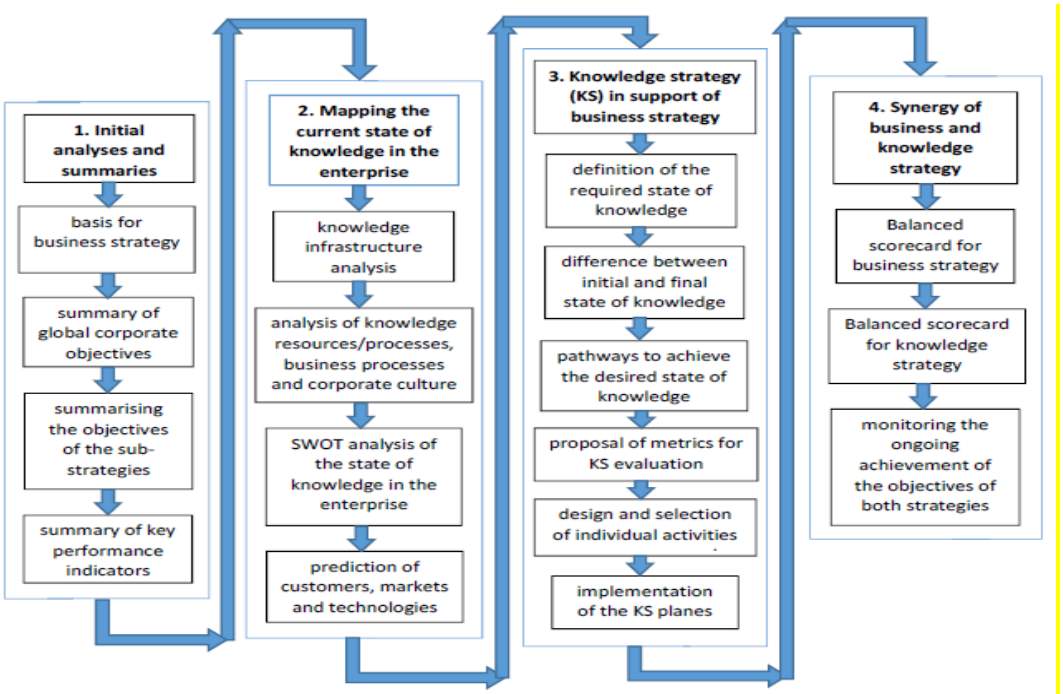

Fig. 5: Methodology of knowledge support for the creation of business and knowledge strategy update [1]

4. CONCLUSION

Current modern management systems cannot do without the implementation and, in particular, the most effective development, of knowledge management systems. This area is the focus of interest of both workers on the theoretical front and business managers. However, theoreticians and business managers need to work together to resolve certain sub-tasks which remain unresolved between the two areas. The purpose of this paper was to attempt to practically refine the content of business knowledge strategy and to propose a methodology for its development and its use in the development and implementation of business strategies in industrial enterprises. At the same time, this paper provided an answer to the research issues defined in its introduction.

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