KNOWLEDGE MANAGEMENT AND VALUE CREATION

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SUMMARY

Understanding the role of knowledge-based processes is one of the key elements to correctly interpret the possible value chains within the organisations. The current research's aim is to introduce a pragmatic approach about how to manage knowledge effectively. As a general introduction the related standards and best practices will be introduced. After gaining a common understanding about the domain, a holistic framework is collated.
100 company representatives (Hungarians and non-Hungarians) were asked about the followings: process management, knowledge management, strategy and their connection with value creation. The respondents provided a summary about their own attitude and their organisation's current status. Evaluating the standards against the answers allows a detailed gap analysis what covers both the technical and the human aspects. Although the exploration of the knowledge management is complex, especially from this point of view, the results may provide a coherent composition of the crucial factors already at preliminary stage.
Collecting the components helps with indicating the relevance of the domain, and shows those sub-areas what require more attention by pinpointing the possible value creating opportunities or barriers. The research has dual-purpose: it presents the theoretical background and it gives a practical guideline.

PROBLEM STATEMENT

Before stating the problems to be analysed, it is clarified what is the specific scope and what are the supporting definitions.
The knowledge-intensive organisations can be distinguished from traditional industrial organisations. Alvesson (2001) points out that the knowledge-intensive organisations are those organisations where the overwhelming part of the work is of intellectual nature and where qualified employees form the major part of the workforce. According to Nurmi (1998) these types of organisations transform what they know into knowledge products and services for their customers. However research and development activities (Lee, 1999) are also taken into account as representing the profile with the highest impact, the current research covers mainly just service providers.
The 'complete' knowledge is added up from the two main types of knowledge: the explicit and the tacit (Polányi, 1966). The explicit knowledge can be documented, codified; it can be stored in digital systems and its transfer is possible. The tacit knowledge is what people carry in their mind, it is difficult to be assessed and evaluated, its transfer is not possible and its processesare not transparent. There are some approaches (Nonaka, 1994) what reveal the substantial steps in the whole phenomenon as a "social learning process" but still it is not easy to provide a measurable framework.

The effective knowledge management means in the current research something more like a cultural attitude towards the knowledge resources and the relevant business processes, it means that the resource managers and workers are aware of the business objectives and the available resources, both of the human and non-human sides, and they are able to construct a relevant connection amongst them. Or at least they try to establish the grounds what are the basis for the possible value-channels within organisations. So the effective knowledge management means not a simplified measuring system, but a holistic view, since the quantitative indicators are usually ad hoc and rare (Smits & de Moor, 2004).
The author is looking for the answers for the following questions on the long term:

1. Can the organisational knowledge be evaluated?
2. Can the applicability of the knowledge management be defined?
3. Can the optimal level of the knowledge management be determined?

The knowledge management's domain is very complex,during the research the goal is to maintain the holistic view, and to provide traceable and demonstrable evidences to support the original aim of the research.
The applicability could cover multiple dimensions at the same time, the surrounding environment, the corporate's culture, the size of the business entities, the sector in what they are active, the nature of the business problems, and the structure of the business processes and automatisation level of the processes could be all the parts of the research. Since the combination of all the elements can create an interminable set, the – from research's perspective – relevant elements will compose the frame.
The optimisation is in operations research the selection of the best element from a set of alternatives. The outcome of the research should give some general findings about how to translate the on-going business processes into a measurable and yielding management practice in order to create value for the organisation.
In the next chapter the methodology of the research is introduced.

RESEARCH METHOD

During the organisational research the most common way is to use quantitative or qualitative research (Balaton &Dobák, 1991).
The quantitative research quantifies data and tries to give a generalized result on a specific topic, usually a large number of cases represent the specific population. The data collection mechanism might be based on interviews, questionnaires. Its findings are descriptive based on statistical methods. It can be used to recommend a final answer or a decision. (Babbie, 2003a)
The qualitative research tries to develop an understanding about a specific domain, it tries to uncover hidden relationships by generating the common grounds for later quantitative researches. The sample size is usually not representative. Collecting this kind of data is not that structured as in the case of quantitative research, but rather unstructured, applicable form is more a discussion or depth interview what provides non-statistical data. Its outcome is exploratory, the findings can be used to outline the base for further discussion and quantitative analysis. (Babbie, 2003b)

From practical approach it might be also valid to use the adequate combination of the upper methods, since the same question might be analysed from different perspectives. The methodological triangulation (Balaton &Dobák, 1991) allows the followings:

- "…simultaneous application of various qualitative procedures,
- simultaneous application of various quantitative procedures,
- combination of quantitative and qualitative methods."

In the present research both of the methods are relevant, a specific combination of them will be used.

In general the researches' intend is either to set up a new theory or to validate/argue/confute on an already alive one. The current research's aim is to build up a new theory with the help of already existing theories, practices and a specifically designed research framework.
The logical build-up of the research should be also mentioned, because it impels the line of the research. Two main directions are available: the inductive and the deductive approach. The main difference is that the inductive approach is aimed to generate a new theory, the deductive's to test a theory.
The inductive approach (Figure 1.) starts with collecting the relevant data, then, if it meets the requirements, the next step might come to identify patterns what later on can be developed in a theory, it supports the exploratory research (Babbie, 2003c).



Figure 1. - Inductive research
Source: Babbie (2003c)

The research is basically inductive, the explorative direction is the priority, because at the end a theory-set will be set up, but there are some deductive approaches during the validator steps. A combination of quantitative and qualitative methods is used, too. Multiple data sources (evidences), theories and methods are used to get confirmation about the consistency of the examined phenomenon. As a possible future step the research will be completed with interviews in order to get validation.
In practice the results of 100 questionnaires are analysed, the sample is not representative, but the amount of answers can give already a reliable source for establishing a more mature framework for the later steps. Actually the feasibility of the research had to be taken also into account, because even with the help of computer-aided technologies the research needed more working hours than expected. Most of the answer givers come from business entities where there is supportive information and communication technology (ICT) environment, the work's complexity is middle and the knowledge intensity is also on middle level, not high-tech. The geographic focus of the research is dual: 49 business entities are Hungarians, the others are non-Hungarians, they are mainly from the more developed Western-European countries, however it is not yet deeply analysed.
In the next chapter the research's content is introduced.

RESEARCH

The evaluation and assessing of the knowledge management is a complex task even in the case of small business entities with low number of possible interactions. In case of larger sizes the task's complexity grows, especially if there are more functions involved.
In this research the supportive background is built on standards and best practices (Table 1.). The conformance to these is the base of interpreting the results of the questionnaires.
The following standards are related to the domainISO 9001 (ISO, 2015a), ISO 20000 (ISO, 2015b) and ISO 27001 (ISO, 2015c).
Best practices and methods were also considered during the phrasing of the questionnaires, the research relies mainly on the followings:CMMI® for Services (CMMI, 2010), Six Sigma (Kubiak&Benbow, 2013, Munro et al., 2013),ITIL® V3 (ITIL, 2007) and COBIT®5 (COBIT5, 2012). The sources are from international origin, they are widely accepted amongst knowledge-intensive business entities.

Table 1. Applied standards and methodologies, best practices

Domain	Standards	Methodologies and best practices
Knowledge Management (Quality)	ISO 9001 - Quality (ISO, 2015a)	CMMI®-SVC - Maturity Model (CMMI, 2010)
Process Management	ISO 20000 - Service (ISO, 2015b)	Six Sigma – Process (Kubiak&Benbow, 2013, Munro et al., 2013) ITIL® - Service (ITIL, 2007)
Risk Management, Security	ISO 27001 – Security (ISO, 2015c)	COBIT®5 - IT Governance (COBIT5, 2012)

Source: own collection (2015)

In the following sub-points a short introduction and the relevance of the given methods are presented.

Standards

The used standards are developed by the International Organization for Standardization. These standards can be used directly (even on international level) or could be tailored as per the domestic requirements and local demands. The most important benefit of using these standards is that it can significantly raise the awareness of cooperating business entities about the processes. In the coming three sub-points the most relevant standards are shortly shown.

ISO 20000

The ISO 20000 is meant for the service management systems, it specifies the service providers' requirement for design, transition, delivery and improvement of services.
It can be used for both the service providers and the service buyers, users, since it can give a consistent framework about the service supply chain and about measurement. The ISO 20000 does not specify everything in details, but it gives advices about designing the processes.
From the knowledge management aspect the 4.4 chapter is the most relevant since it covers the resource management.
This standard is commonly used in ICT service management.

ISO 9001

The ISO 9001 standards is about how to adopt a quality management system on strategic level. Its main focus is to provide a consistent framework for the business in order to meet the customer needs. It clearly defines the general requirements, the documentation requirements, the management responsibilities, the resource management and the realisation of them. In addition the measurement and improvement opportunities are also stated. This type of logical path is used in every ISO standard.
In case of ISO 9001 one of the most important part is the '6.2 Human resources' part in what the competence, training and awareness related requirements are set. Also it is stated that there is a requirement to maintain evidences within the system.

ISO 27001

The ISO 27001 is for organisations what would like to keep information assets secure. It basically covers the requirements of risk management, security awareness and business continuity management.
The structure of this standard is similar to the two others, the common thing is that their logical path is similar, requirements are set for responsibilities and managing, but the content is here risk-related. The '5.2 Resource Management' is basically the same as in the former case, just the domain differs.

All the ISO standards follow the same logic, all of them have relevant connections with knowledge management, especially through resource management.
In the next sub-chapter the relevant methodologies and best practices are shortly introduced.

Methodologies and best practices

Table 1.follows the thinking of the author, the table is not deeply stratified, but on this level it was not yet the goal. It is just a basic collection of the most relevant background standards and methods. The above mentioned standards can be completed with the following practices.

Six Sigma

The Six Sigma is a set of tools in order to achieve maintainable process improvements within the organisations. It is mainly based on quantified data and derivated statistical approaches. Its main focus is to have a measurable and quantifiable result rather than assumptions.
Measuring the systems based on data is common and logical. What in this case very important is, since it is about knowledge management, that this methodology has so-called Subject Matter Experts (SME). SMEs are those individuals who have the highest experience level within the organisation, they can enable others to perform better.
Six Sigma has of course other very relevant aspects, but this had to be highlighted now.

ITIL – Service Management

The Information Technology Infrastructure Library (ITIL) is a practice set for information technology service management (ITSM). Its primary goal is to get aligned the business objective with the provided services.
In case of ITIL the knowledge management's goal is to improve the effective sharing of knowledge. This practice handles the knowledge management on strategic level, the most important for this is to get closed the identified knowledge gaps as soon as possible, so the effective knowledge transfer is one of the most important processes.

CMMI

The Capability Maturity Model Integration (CMMI) models are best practice collections what might help the organisations to improve their processes. Since the answers of the research came from the service sector, the CMMI for Services is used, however the knowledge management is a general process area for every CMMI domain, so the approach is unified.
The CMMI for Services is a very complex practice set, it defines generic goals and specific goals what should be followed by the business entities. The generic goals are those goals what is a necessity in every case and every domain, knowledge management is handled on this level, it means it does not depend on the domains, but it is generic. The general process (GP) 2.5 'Train People' and GP 3.2 'Collect Process Related Experiences' were relevant for the questionnaire.

COBIT

The Control Objective for Information and Related Technology (COBIT) is a framework for information technology management and governance. Its focus is on risk management, but ensuring compliance to requirements and managing security related domains is also covered.
Delak (2015) used COBIT5 for evaluating processes from knowledge management perspective for the enabling processes, for assurance and process assessing. Two main domains were used 'Manage Human Resources' and 'Manage Knowledge'. Outcomes about handling the processes in real life and work products were used for analysis. The work

products are those evidences what justify that the specific process steps were done. This approach is really close to the author's.

The above described standards and methodologies are quite wide and not exactly knowledge specific, but every of them has relevant connections with it. The common outcomes of the above approaches were used for the questionnaires as the main source of input during the design.
In the next chapter the preliminary results will be introduced.

PRELIMINARY RESULTS

In this point the processed results are shown, but first an overview comes about the participating companies. Most of the companies are active (with the proviso that a company can be active in more domains) on knowledge intensive fields, so the shown background is applicable(for the classification the United Nations's international standards was used.)
In Table 2.the company sizes can be found, distinguished are the Non-Hungarian and Hungarian companies.

Table 2. Company size

Company size(nr. of entities)	**All companies (100 entities)**	**Non-Hungarian companies (51 entities)**	**Hungarian companies (49 entities)**
Large-sized enterprise	69	34	35
Medium-sized enterprise	19	13	6
Small-sized enterprise	7	0	7
Micro-sized enterprise	5	4	1

Source: own collection (2015)

The company representatives (Hungarians and non-Hungarians) were asked about process management, knowledge management and their connection with value creation. Since the questionnaire had more than 100 questions, just some important and interesting results are highlighted (Table 3.), the results are not converted to percentages on purpose, since the sample size is 100 (so the interpretation might be quite easy even at first look).

Table 3. Preliminary results

Domain (nr. of corresponding answers)	**All companies (100 entities)**	**Non-Hungarian companies (51 entities)**	**Hungarian companies (49 entities)**
1 Business process management			
1.1 Overlapping amongst the roles	80	39	41
1.2 Authority issues	83	47	36
1.3 Ability to find the competent person	84	44	42
1.4 Ability to find the competent role	76	37	39
1.5 Issues with understanding common terms	86	49	37
2 Knowledge management			
2.1 Knowledge sharing difficulties	54	24	30
2.2 Ability to find knowledge bearer	61	31	30
2.2.1 Ability to find competent roles and persons	21	14	7
2.2.2 Ability to find competent person	26	14	12
2.2.3 Ability to find competent role	14	3	11
2.3 Competence map	66	44	22
2.3.1 Substitute knowledge elements	60	39	21
2.3.2 Complementary knowledge elements	41	24	17
2.3.3 Critical knowledge elements	51	34	17
2.3.4 Competitive advantage-related knowledge elements	55	39	16
2.3.5 Rare, unique knowledge elements	42	27	15

Source: own collection (2015)

The process management part as a critical success factor in knowledge management shows that the roles have overlapping. It means that the responsibility and the accountability are not proper. It is also highlighted that there might be authority issues (83%) amongst the roles.
However the associates within the organisations know where, whom to turn, they are able to find the competent persons and the roles.
Regarding the internal communication it has to be also mentioned that there are issues with the common understanding, since the common terms can be understood differently (86%).
Since the business process management is the main point to measure the system at all, these results are quite important, because if the role distinguishing and the common understanding is not proper that means the measurement baselines are not proper. However the associates are able to find the competent roles and persons. So even if the processes are not properly set, they are still able to work and reach their goal.

From the knowledge management perspective the knowledge transfer, knowledge sharing is in foreground. Approximately in half of the cases there are at least temporary difficulties with knowledge sharing, from the sharer's point of perspective. From the other side, the ability to

find the knowledge bearer, ‘owner’ shows a higher rating, that goes better. It is worthy to mention that the associates can find the competent knowledge bearer person sooner than the role itself, this is similar to the case of the business process management.
The other focus point was to examine whether the business entities follow-up the current status of the available resources.
Two-third of the companies has some kind of databases in what they follow the competences, especially the substitute and competitive advantage-related knowledge elements are tracked. The complementary, critical and unique knowledge elements are of less importance.
Having a high awareness about the substitute knowledge elements might mean that the companies have business continuity orientation, since this can be a source for a living backup system (this statement will be analysed in the next step of the research).
At this level the geographical characteristic of the data is not analysed, it is showed just for presenting that there might be some serious differences, mainly because of the cultural settings.

The original goal of the research is to have measured the value. For value creation the knowledge management is the intended instrument.
At this early stage of the research can be seen that the organisations are not maintained properly from business administration perspective. The basic guidelines and recommendations of the standards and methodologies are not in place, however the companies are still able respond the customer requirements, since they can self-tune themselves and are able to renew.
The human and non-human systems can cope with most of the business problems, this might be because the organisations have a not documented complementary organic life beside the stored enterprise processes.

The research has still potential in it, since just the most important enabling elements were highlighted.
For the further steps the realised value of the business entities and the knowledge awareness should be taken also into account (Figure 2.). For the knowledge awareness the above introduced standards and methodologies will be used. If it will be evidenced that the knowledge awareness has a direct connection with creating value then the next step can come.

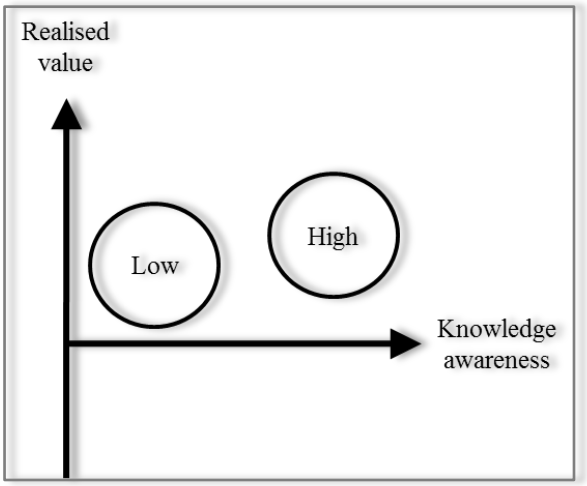


Figure 2. Relation of Realised value and Knowledge awareness
Source: own (2015)

As shown on the previous figure (2.), the realised value might be not just positive, but negative. On Figure 3.it is shown that once the knowledge awareness is set, the knowledge level can be measured (requirements and resources). If the knowledge awareness can be properly measured, that means that the organisational knowledge can be evaluated, and the knowledge management's applicability can be defined.

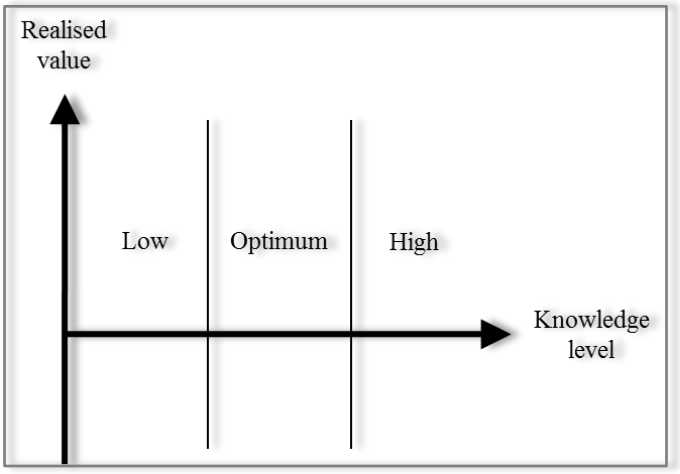


Figure 3. Relation of Realised value and Knowledge level
Source: own (2015)

If the applicability can be defined then the knowledge management optimum can be determined. The knowledge level might be low, when the requirements are not met, or high when the requirements can be met and there is additional extra resource within the system. The optimum level is between these two, but for determining this, it is required to have the knowledge awareness processes set.
In the next point the conclusions are aggregated.

CONCLUSIONS

Summarizing the main findings it can be stated that the knowledge management has some difficulties to be measured properly. On the top of this it can be seen (based on the answers of the questionnaires) that there are problems both with the business process management and knowledge management practice, at least from the point of documentation. The responsibilities are not well defined, the processes are not proper and there are some serious issues with understanding the common language within the environment.

From the knowledge management aspect the competence maps are not properly maintained and there are difficulties with the knowledge sharing, again from documentation perspective.However the organisations are working.

The key outcome of this research is that there must be a documented, codified system, and beside that an organic one. The further steps of the research will keep this latter challenge in scope, but will be limited to the earlier one, the coming steps will rely especially on the shown standards and methodologies.

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