Towards Defining Knowledge Management Success

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Abstract

Discussions at previous HICSS conferences have shown that there is no general agreement on definitions of Knowledge Management (KM) and Knowledge Management Systems (KMS) success. A deep understanding of these concepts would help to design and implement efficient KM initiatives and systems. We present an exploratory research study to begin and facilitate a debate that will hopefully lead to a consensus definition of KM and KMS success. We chose an expert panel approach followed by two exploratory surveys to approach the KM and KMS success definition. The research shows only a few points of consensus. We present areas of agreement as well as of disagreement, which serve as a good starting point for further discussions on KM and KMS success.

1. Introduction

The Knowledge Management Foundations workshop held at the Hawaii International Conference on System Sciences (HICSS-39) in January 2006 explored factors that affect Knowledge Management (KM) and Knowledge Management System (KMS) success. Workshop participants reached agreement that understanding and defining these success factors is a difficult endeavor due to the dynamic nature of knowledge. Nonetheless, it is important for the credibility of the KM discipline. Identifying the factors, constructs, and variables that define KM success is crucial to understanding how these initiatives and systems should be designed and implemented. The purpose of this paper is to initiate discussion on the topic of KM and KMS success. The results of two surveys are presented. Each of the surveys examines how KM practitioners, academics, and students view KM and KMS success. The first section of the paper presents prior literature along with perspectives from workshop participants to provide initial background on KM and KMS success. The following section provides additional perspectives which were derived by examining survey responses to questions asking academics and practitioners how they defined KM/KMS success. We conclude by presenting the results of two exploratory surveys on KM/KMS success beliefs and attitudes and include a KM success definition found to be acceptable to the KM community. It is hoped that this paper will begin the debate that will lead to a theoretically based definition of KM/KMS success.

2. Background on KM Success

Jennex summarizes multiple descriptions of KM to offer a single succinct definition; KM success is reusing knowledge to improve organizational effectiveness by providing the appropriate knowledge to those that need it when it is needed [3]. Successful KM is expected to have a positive impact on the organization that improves organizational effectiveness. DeLone and McLean use the terms success and effectiveness interchangeably and one of the perspectives proposed in this paper does the same for KM [1], [2].

Jennex and Olfman [4] summarized and synthesized the literature on KM/KMS critical success factors (CSF) into an ordered set of twelve KM CSFs. These factors were ordered based on the number of studies identifying the CSF. The following critical success factors were identified from 17 studies which consider over 200 KM projects:

- A ***knowledge strategy*** that identifies users, sources, processes, storage strategy, knowledge, and links to knowledge for the KMS
- ***Motivation and commitment*** of users including incentives and training
- ***Integrated technical infrastructure*** including networks, databases/repositories, computers, software, and KMS experts
- An ***organizational culture*** and ***structure*** that supports learning as well as the sharing and use of knowledge
- A common ***enterprise wide knowledge structure*** that is clearly articulated and easily understood

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- *Senior management support* including allocation of resources, leadership, and providing training
- *Learning organization*
- A *clear goal* and *purpose* for the KMS
- *Measures* are established to assess the impacts of the KMS and the use of knowledge as well as verifying that the right knowledge is being captured
- The search, retrieval, and visualization functions of the KMS support *easy knowledge use*
- Business processes are designed that incorporate knowledge capture and use
- *Security/protection* of knowledge

From our view, these CSFs do not define KM/KMS success; they merely indicate what is needed to be successful. Without a definition of KM/KMS success it is difficult to measure actual success. We believe measuring KM and KMS success is important:

- to provide a basis for company valuation,
- to stimulate management to focus on what is important, and
- to justify investments in KM activities [4][7].

Besides these reasons from an organizational perspective, the measurement of KM and KMS success is important for building and implementing efficient KM initiatives and systems from the perspective of KM academics and practitioners [4].

3. Perspectives on KM/KMS Success

Knowledge, knowledge management and knowledge management systems have been given broad consideration at HICSS over the last 12 years. It is generally agreed that knowledge enables action and guides decision making within organization. However, measures that constitute KM and KMS are not well understood or agreed upon. Roughly thirty KM researchers participated in a workshop to discuss KM research and practice prior to HICSS-39. The workshop at identified several perspectives on KM and KMS success. This section briefly summarizes these perspectives.

3.1. KM Success and Effectiveness

One perspective considers KM *success* and KM *effectiveness* to be interchangeable implying they are the same construct or variable. This view is based on the notion that effectiveness is a manifestation of success. An example supporting this view would be increasing decision making effectiveness to generate a positive impact on the organization resulting in successful KM. This perspective uses both process and outcome measures.

3.2. KM and KMS Success as Interchangeable

Another perspective considers *KM* and KM *Systems* success to be interchangeable. KMS success can be defined as making KMS components more effective by improving search speed, accuracy, etc. As an example, a KMS that enhances search and retrieval functions enhances decision making effectiveness by improving the ability of the decision maker to find and retrieve appropriate knowledge in a more timely manner. The implication is that by increasing KMS effectiveness, KMS success is enhanced and decision making capability is enhanced leading to positive impacts on the organization. This is how KM success is defined and it is concluded that enhancing KMS effectiveness makes the KMS more successful as well as being a reflection of KM success. The Jennex and Olfman KM Success Model [5], based on the DeLone and McLean IS Success Model [2], combines KM and KMS success and utilizes this perspective.

3.3. KM and KMS Success as Separate

This perspective views KM and KMS success as separate measures. It is based on a narrow system view that allows for KMS success that does not translate into KM success. KMS are often seen as a sub-function of KM comprising technical and organizational instruments to implement KM. Thus, KMS success addresses implementation and operation factors in terms of system or process metrics whereas KM success is an assessment of the value that these systems and processes provide to an organization. KM focuses therefore more on the outcome, while KMS focus more on the process. These perspectives are introduced in the following sections.

3.4. KM Success as a Process Measure

This perspective views KM success as a process measure. KM success could be therefore described in terms of the efficient achievement of well defined organizational and process goals by means of the systematic employment of both organizational instruments and information and communication technologies for a targeted creation and utilization of knowledge as well as for making knowledge available. KM is a support function to improve knowledge-intensive business processes. An example would be supporting the technology forecasting process in an IT consulting firm by technical components of a KMS [6]. Complementary, the effective implementation of knowledge processes (i.e. acquisition, creation,

sharing, and codification) is seen as a part of KM success. This perspective focuses therefore on measuring how much KM contributes to improving the effectiveness of business and knowledge processes.

3.5. KM Success as an Outcome Measure

In contrast, this perspective views KM success as an outcome measure. KM success is therefore seen as a measure of the various outcomes of knowledge process capabilities existing within an organization as a result of undertaken KM initiatives. Typical outcomes in terms of organizational performance are the enhancement of:
- product and service quality,
- productivity,
- innovative ability and activity,
- competitive capacity and position in the market,
- proximity to customers and customer satisfaction,
- employee satisfaction,
- communication and knowledge sharing, and
- knowledge transparency and retention.

3.6. KM Success as Combined Process and Outcome Measures

The last perspective views KM success as a combination of process and outcome measures. Respective descriptions of KM success focus on improved process effectiveness (cf. section 3.4.) as well as on achieving actionable outcomes (cf. section 3.5). Sections 3.1 and 3.3 contain examples for this combined approach.

4. Methodology

This paper is exploratory research with the goal of guiding the KM community towards a consensus definition of KM success. To achieve this, base data was obtained through an exploratory survey. The exploratory survey was generated through an expert panel approach. The 30 members of the editorial review board of the International Journal of Knowledge Management were asked to provide their definitions of KM success. Thirteen responses were received. These responses were used to generate an exploratory survey on KM success. The survey used 5 point Likert scale items to solicit feedback on KM perspectives and proposed KM success definitions. The perspectives were generated by analyzing the responses of the expert board. These responses were found to be grouped two ways. The first grouping of responses looked at the measures used to determine

KM success. Three groupings were observed: process based measures, outcome based measures, and combined process and outcome based measures. The second grouping of responses was in two groupings: those that combined KM and KMS success measures and those that viewed KM and KMS success as separate measures. A final observation was that many proposed definitions used success and effectiveness interchangeably.

The exploratory survey also collected data on the KM expertise and focus of the respondent. Also, the survey had text boxes that allowed for free form input on additional KM success factors or measures, KM success definitions, and thoughts on differences between KM and KMS success.

The exploratory survey was administered using a web form with data collected and stored automatically. Survey respondents were solicited via broadcast emails to the ISWorld and DSI email list servers, to lists of KM researchers maintained by the authors, and to the editorial review board and list of authors for the International Journal of Knowledge Management. An initial request was sent followed by a second request approximately one week later.

One hundred and three usable survey responses were received. Thirteen were from KM practitioners, 70 were from KM researchers, 6 were from KM students, and 14 were from academics interested in KM but not active KM researchers. Likert items were analyzed using means and standard deviations as no hypotheses have been proposed and need testing.

The results of the first exploratory survey were used to generate a second survey. This survey presented a composite definition of KM success and a set of measures for each of the indicated dimensions. A 7 point Likert scale was used to solicit agreement on the composite definition and each set of measures. Additionally, as in the first exploratory survey items were provided for collecting data on KM expertise and respondent focus. Also, each set of measures had boxes where respondents could indicate measures they would add or remove from each set of measures.

The second survey was also administered using a web form with respondents solicited in the same manner as the first exploratory survey. Seventy-seven usable survey responses were received. Two were from KM practitioners, 49 were from KM researchers, 7 from KM students, and 19 were from academics interested in KM but not active KM researchers. Likert items were analyzed using means and standard deviations as no hypotheses have been proposed and need testing.

Survey items are provided in Section 9.

5. Findings

There was little consensus on KM success perspective or definition from the first survey while we did find agreement on a definition of KM success and measures of success in the second survey. The results of the first survey are summarized in tables 1-3 while the results of the second survey are presented in Table 4.

Table 1 presents opinions with respect to the perspectives on KM success. The only perspective that tends to have any consensus agreement is that KM success is a combination of process and outcome measures and is NOT just process or just outcomes. We are undecided if success and effectiveness are equivalent measures and tend to be undecided to slightly against the idea that KM and KMS success are equivalent.

Table 1. Opinions on KM success perspectives, mean (std dev)

	Overall	Research	Practice	Academ	Stud
Success = Effectiveness	3.1 (1.4)	3 (1.4)	3.3 (1.3)	3.2 (1.5)	3.7 (0.5)
KM = KMS Success	2.6 (1.5)	2.5 (1.4)	3.2 (1.6)	3.4 (1.5)	2.2 (1)
KM = KMS Measures	2.6 (1.4)	2.4 (1.4)	3.2 (1.6)	3 (1.4)	2.4 (0.9)
KM Success = Process	2 (1)	1.9 (0.9)	2.2 (1.1)	1.9 (0.8)	3 (1.3)
KM Success = Outcomes	2 (1)	2 (1)	2.2 (1.4)	1.7 (0.8)	2.3 (1)
KM Success = Process & Outcomes	**4** (0.9)	3.9 (1)	3.8 (1)	**4.3** (0.6)	**4.2** (0.8)

Overall n = 103, researcher n = 70, practitioner n=13, academics n=14, and student n=6
Values are rounded to 2 significant digits

Table 2 summarizes opinions on five suggested components of KM and KMS success definitions. There appears to be consensus on using organization specific subjective measures derived for KM process capabilities. Examples of these capabilities include knowledge reuse, quality, relevance, effectiveness of acquisition, search, and application of knowledge, etc. There also appears to be consensus that any KM success definition should include providing the appropriate knowledge when needed. Additionally, there is consensus that use is not a good measure of KMS success. It is interesting to note that practitioners and students support the use of firm performance measures as indicators of KM success while there is less support for these measures from researchers and academics. It is also interesting to note that academics and students tend to support the use of measures

reflecting direct returns from organizational and individual learning and application of knowledge while researchers and practitioners are less favorable to them.

Table 2. Opinions on KM and KMS success definition components, mean (std dev)

Overall	Research	Practice	Academics	Students
"Subjective measure of various outcomes of KM processes capabilities" should be included in a definition of KM success				
4.1 (0.8)	**4** (0.9)	**4.3** (0.8)	**4.2** (0.9)	**4.5** (0.8)
"Achieving direct returns from learning and projection" should be included in a definition of KM success				
3.8 (1)	3.7 (1)	3.6 (1)	**4** (1)	**4.3** (0.5)
"Success of KMS should be measured in terms of pure usage statistics" should be included in a definition of KM success				
2.5 (1.2)	2.5 (1.2)	2.2 (1.1)	2.6 (1.2)	2.8 (1.2)
"Success of KMS should be measured in terms of firm performance" should be included in a definition of KM success				
3.7 (1)	3.6 (1.1)	**4.1** (1)	3.5 (0.8)	**4** (0.9)
"Providing the appropriate knowledge when needed" should be included in a definition of KM success				
4.2 (0.9)	**4.2** (0.9)	**4.3** (0.9)	**4.4** (0.6)	**4.3** (0.5)

Overall n = 103, researcher n = 70, practitioner n=13, academics n=14, and student n=6
Values are rounded to 2 significant digits

Table 3 summarizes opinions on five suggested definitions of KM and KMS success. There appears to be little consensus on these definitions other than a general neutrality on KM success as the flow of knowledge and KMS success as improving effectiveness of the KMS components.

However, there are some interesting observations. KM success as the ability to leverage knowledge resources to achieve actionable outcomes is overall supported with the strongest support coming from practitioners. This is interesting but not surprising as practitioners tend to favor definitions and measures that are objective, readily measurable, and have an obvious impact on the organization.

This is also why practitioners favor KM success as reusing knowledge to improve organizational effectiveness and KM success as the efficient achievement of well defined organizational goals for targeted creation and utilization of knowledge.

Table 4 summarizes opinions from the second survey on a proposed success definition generated from the first survey and sets of measures for the dimensions listed in the proposed definition. There appears to be some level of consensus on the proposed definition and measures. However, we do not consider it strong consensus given that the mean response is between agree and somewhat agree. Still, this is considered a strong beginning to establishing a common definition and set of success measures.

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Table 3. Opinions on KM and KMS success definitions, mean (std dev)

Overall	Research	Practice	Academics	Students
KMS success can be defined as making KMS components more effective by improving search speed, accuracy, etc.				
3 (1.2)	2.8 (1.1)	3.6 (1.2)	3.1 (1.1)	3.2 (1)
KM success is the ability to leverage knowledge resources to achieve actionable outcomes.				
4 (1)	**4** (1)	**4.3** (0.9)	3.9 (0.9)	3.7 (1)
KM success is reusing knowledge to improve organizational effectiveness by providing the appropriate knowledge to those that need it when it is needed.				
3.9 (1)	3.8 (1.1)	**4.4** (0.91)	**4.1** (0.7)	3.8 (0.4)
KM success is knowledge – tacit and explicit alike – circulates freely throughout the organization, with no debilitating clumping, clotting, or hemorrhaging.				
3 (1.2)	2.8 (1.2)	3.2 (1.5)	3.4 (0.8)	2.7 (1)
KM success is the efficient achievement of well defined organizational and process goals by means of the systematic employment of both organizational instruments and information and communication technologies for a targeted creation and utilization of knowledge as well as for making knowledge available.				
3.7 (1.2)	3.5 (1.3)	**4.2** (1.1)	3.8 (0.9)	3.8 (1.2)

Overall n = 103, researcher n = 70, practitioner n=13, academics n=14, and student n=6

Values are rounded to 2 significant digits

Table 4. Opinions on KM and KMS success definition and sets of measures, mean (std dev)

Overall	Research	Practice	Academics	Students
KM success is a multidimensional concept. It is defined by capturing the right knowledge, getting the right knowledge to the right user, and using this knowledge to improve organizational and/or individual performance. KM success is measured using the dimensions of impact on business processes, strategy, leadership, efficiency and effectiveness of KM processes, efficiency and effectiveness of the KM system, organizational culture, and knowledge content.				
5.4 (1.3)	5.3 (1.4)	6.5 (0.7)	5.3 (1.5)	6 (0.5)
Impact on business process measures.				
5.6 (1.3)	5.5 (1.3)	6.5 (0.7)	5.5 (1.5)	5.7 (0.8)
Strategy measures				
5.3 (1.4)	5.3 (1.3)	6.5 (0.7)	5 (1.6)	5.7 (0.8)
Leadership measures				
5.2 (1.4)	5.2 (1.3)	5.5 (2.1)	4.8 (1.8)	5.5 (1.4)
KM process effectiveness and efficiency measures				
5.7 (1.2)	5.8 (1.1)	6.5 (0.7)	5.2 (1.6)	6 (0.9)
KM system effectiveness and efficiency measures				
5.6 (1.3)	5.6 (1.1)	6.5 (0.7)	5.6 (1.7)	5.7 (1.0)
Learning culture measures				
5.7 (0.9)	5.7 (0.7)	6.5 (0.7)	5.3 (1.4)	6.2 (0.4)
Knowledge content measures				
5.4 (1.3)	5.3 (1.3)	5.5 (2.1)	5.4 (1.5)	5.4 (1.3)

Overall n = 77, researcher n = 49, practitioner n=2, academics n=19, and student n=7

Values are rounded to 2 significant digits

6. Discussion

This is exploratory research so few conclusions can be drawn. However, using two surveys has allowed us to reach some consensus on a KM success definition and set of success measures. We propose the following consensus definition based on our discussion with workshop participants and feedback from the two surveys:

"KM and KMS success are a multidimensional concept. Each includes capturing the right knowledge, getting the right knowledge to the right user, and using this knowledge to improve organizational and/or individual performance. KM success is measured using the dimensions of impact on business processes, strategy, leadership, efficiency and effectiveness of KM processes, efficiency and effectiveness of the KM system, organizational culture, and knowledge content."

Based on survey results the following caveats are offered:

- KM success and KMS success may not be the same thing.
- Usage is not a good measure of KM or KMS success.

Additionally, it is possible that there is a different focus on KM success between practitioners and researchers. Researchers do not seem to have a clear idea of KM success while practitioners appear focused on KM success as being tied to its impact on organizational performance and effectiveness. This can not be stated conclusively, the number of practitioner responses are too low (n=13) making this supposition. However, it is not unexpected that practitioners would have a focus on organizational impact as a measure of KM and KMS success. Given that KM is an action discipline, researchers should accept this focus and incorporate it into their investigations.

There are some limitations to this research. It is quite possible that the reason little consensus has been observed is because KM and KMS success are complex constructs that are multidimensional. It may be that KM and KMS success includes outcome measures, quality of knowledge, how well the KM processes function, organizational culture measures, usability measures, and strategy measures. This is consistent with the DeLone and McLean model of Information Systems success [1], [2] and there is much empirical evidence to support the correctness of this model. This model is also the basis of the Jennex and Olfman KM success model [5]. It is quite likely that the first exploratory survey used for this research, while generated using an expert panel, probably did not capture the multidimensional nature of the provided KM success definitions and therefore made it difficult for respondents to find statements they fully agreed with. This limitation was considered when

generating the second survey and it appears that this has improved consensus with the KM success definition generated from the first survey.

7. Conclusions

It is difficult to reach any conclusions with this research; no hypotheses were proposed or tested. This is okay as the purpose of this paper is to start a focused discussion on KM and KMS success. The responses to the exploratory surveys show this will happen as well as the minitrack focused on KM and KMS success and measurement at the Hawaii International Conference on System Sciences, HICSS.

To begin this dialogue it is important to identify areas of consensus and areas of disagreement. The following points are areas of agreement:

- Use is a poor measure of KM and KMS success.
- KM success is likely a multidimensional construct that will include process and outcome measures.
- A first base definition of KM success is:
  "KM success is reusing knowledge to improve organizational effectiveness by providing the appropriate knowledge to those that need it when it is needed."

Additionally, a more elaborated base definition of KM success can be established:

"KM success is a multidimensional concept. It is defined by capturing the right knowledge, getting the right knowledge to the right user, and using this knowledge to improve organizational and/or individual performance. KM success is measured using the dimensions of impact on business processes, strategy, leadership, efficiency and effectiveness of KM processes, efficiency and effectiveness of the KM system, organizational culture, and knowledge content."

Some areas of disagreement are in further need of discussion:

- KM and KMS success are essentially the same (in deference to the authors and consistent with a Churchman view of a KMS and DeLone and McLean [1], [2]).
- The role of learning and firm performance in KM success.
- The role of outcome measures such as speed, accuracy, amount of knowledge stored and used, etc. in KM and KMS success.

Two key questions remain to be resolved:

- The relationship between KM and KMS success. Are they different definitions or essentially the same.

- Is KM success and effectiveness essentially the same construct and able to use the same measures.

It is expected that it will take a great deal of research before consensus is reached on what KM and KMS success is. It is concluded that this paper and these findings from the exploratory surveys are a good starting point for this discussion.

8. References

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9. Exploratory Survey Items

9.1. KM Success Perspective Items

1. KM success and KM effectiveness are essentially the same and can be assessed using the same measures
2. KM and KMS success are essentially the same (assuming a holistic view of systems)
3. KM and KMS success can be assessed using the same measures
4. KM success should only be defined in terms of process measures

5. KM success should only be defined in terms of measurable parameters (use, search times, etc.)
6. KM success should be defined as a mix of process and measurable parameters

9.2. KM Success Definition Items

1. "Subjective measure of various outcomes of KM processes capabilities" should be included in a definition of KM success
2. "Achieving direct returns from learning and projection" should be included in a definition of KM success
3. "Success of KMS should be measured in terms of pure usage statistics" should be included in a definition of KM success
4. "Success of KMS should be measured in terms of firm performance" should be included in a definition of KM success
5. "Providing the appropriate knowledge when needed" should be included in a definition of KM success
6. Definition of KMS success: "KMS success can be defined as making KMS components more effective by improving search speed, accuracy, etc."
7. Definition of KM success: "KM success is the ability to leverage knowledge resources to achieve actionable outcomes."
8. Definition of KM success: "KM success is reusing knowledge to improve organizational effectiveness by providing the appropriate knowledge to those that need it when it is needed."
9. Definition of KM success: "Knowledge – tacit and explicit alike – circulates freely throughout the organization, with no debilitating clumping, clotting or hemorrhaging."
10. Definition of KM success: "KM success is the efficient achievement of well defined organizational and process goals by means of the systematic employment of both organizational instruments and information and communication technologies for a targeted creation and utilization of knowledge as well as for making knowledge available."

9.3. KM Success Second Survey Items

1. Please indicate your agreement with the below definition of KM success:
   "KM success is a multidimensional concept. It is defined by capturing the right knowledge, getting the right knowledge to the right user,
   and using this knowledge to improve organizational and/or individual performance. KM success is measured using the dimensions of impact on business processes, strategy, leadership, efficiency and effectiveness of KM processes, efficiency and effectiveness of the KM system, organizational culture, and knowledge content."

2. Measures for measuring the dimension of impact on business processes include:
   - Learning (e.g. adds value to work processes by extending the capabilities of individual employees)
   - Action (e.g. ability to produce both tangible outputs and the intangible outcomes of business processes; rate of innovation (knowledge creation); effective/improved performance resulting from timely knowledge transfer can be measured; efficient and effective decision making; outcome/value oriented knowledge activities; efficiency gains)
   - Quantify labor savings versus non-KM based legacy procedures (labor savings can be either in time saving or the ability to use lower cost labor)
   - Providing a better quality of information/products to customers
   - Outcome measure (e.g. outcomes of actions; impacts on organizational performance variables like product innovation, competitiveness, growth etc.; positive (measurable) outcomes like profit; firm performance measures; financial performance (ROI, ROA, profits, etc.) and market performance (sales, market share, brand equity, etc.) after (compared to before) KMS implementation)

3. Measures for measuring the dimension of strategy include:
   - Strategy measures (strategic alignment with organizational aims and objectives, ties between target knowledge for capture and use in determining KPIs, key performance indicators, and use by target knowledge users)
   - Social capital measures
   - Knowledge integration (e.g. cross fertilization of knowledge across domains) Outcome measure (e.g. outcomes of actions; impacts on organizational performance variables like product innovation, competitiveness, growth etc.; positive (measurable) outcomes like profit; firm performance measures; financial performance (ROI, ROA, profits, etc.) and market performance (sales, market share, brand equity, etc.) after (compared to before) KMS implementation)

4. Measures for measuring the dimension of leadership include:

- Level of leadership/executive support (policies and statements of support for KM, allocation of resources for KM, incorporation of KM abilities into the individual evaluation process)

5. Measures for measuring the dimension of KM process efficiency and effectiveness include:

- How well the KM processes function (e.g. lively knowledge processes; descriptions and measure of knowledge processes; effective acquisition of knowledge; safe and effective storage of knowledge; effective and smooth dissemination of both tacit and implicit knowledge to those who need it)
- KM processes and KMS that are integrated seamlessly into employees daily work (e.g. ability to include/not-provide-obstacles-to emergent knowledge and learning, in novel situations)
- Providing a better quality knowledge to knowledge users (how much knowledge is captured in electronic format versus left in the head or on paper, efficiency of the mnemonic functions of search, retrieval, extraction, manipulation, and visualization)
- Increasing/enhanced collaboration
- Improved communication (e.g. excellent two-way and engaging communications practice (online and face-to-face))

6. Measures for measuring the dimension of KM System effectiveness and efficiency include:

- Usability measures (e.g. intuitive usage of KMS; ease of use, overall response time)
- Efficiency of KMS (e.g. efficient and effective retrieval of information and data; effort needed to maintain; ability to assist in an ad-hoc situation; providing conducive environment for learning; support for evolution of knowledge residing within the system)
- Adoption/actual use (e.g. pure usage statistics – i.e. # of knowledge items, growth of knowledge items over time, number of access/uses, growth of this over time etc.)
- Adaptability of the system (system allows for tailoring to user preferences)
- Appropriate use (system is used when it is appropriate)
- Sustainability (e.g. is the system attracting and maintaining interest, resources and commitment from participants and non-participants over time?)

7. Measures for measuring the dimension of learning culture include:

- Organizational culture measures (e.g. true success means developing a positive culture for to insure continuous success; increasing awareness; employee satisfaction; organizational transparency; increasing trust and respect)
- Knowledge sharing culture development (e.g. motivation/willingness to share; level of change in culture (from hoarding to sharing); increasing willingness to share information and to contribute to KMS databases)
- Cultural acceptance (e.g. degree of employee acceptance; organizations cultural attitudes toward knowledge)
- Change in leadership culture (e.g. leaders are willing to lower their status to genuinely listen and learn from more 'junior' staff who deal with internal and external customers)

8. Measures for measuring the dimension of knowledge content include:

- Quality of knowledge (e.g. KM success can be measured by the quality (accuracy, pedigree) and relevance of the content to the technical or business challenges of the organization; understandability, conceptual clarity, clear structure of knowledge)
- Efficient and effective retrieval of information and data
- Creation of new knowledge in form of pubs, patents, etc.
- Self-sustaining/self-regulating (regarding introduction of materials, retiring of obsolete knowledge, adjusting to new knowledge and environments)