

Measuring the Performance of Corporate Knowledge Management Systems

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Whereas knowledge management systems (KMS) continues to gain popularity as a corporate most advanced information systems, the acceptance of standardized KMS assessment approaches has lagged. Developing metrics to assess a corporate KMS is inherently problematic due to the intangible nature of knowledge-based resources, and for the fact that measurement is a precursor to improvement. This is true for knowledge management capabilities of an organization. Nonetheless, assessment is of vital importance for valuation purposes as well as to help managers determine whether particular KMS are effective working. The main focus of this paper is to explain the value of knowledge management and provide a general overview of measurement approaches. Finally, developing an improved measurement system for corporate KMS is considered the key to the competitive success of the organization.

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1 Introduction

Sustainable competitiveness can only come through building robustness into processes and their effective management and control. Few corporate have developed a separate “performance measurement system”; performance measurement instead forms an integral part of the management processes and systems within the corporate. For the least two decades, the Romanian big companies have measured the input of knowledge-based resources into their knowledge management systems belief that these resources have a positive, if indefinable effect on economic growth [3]. The first theoretical constructs of the KMS benefits focused on the “linear” model of innovation where an investment in new information systems would eventually lead to wealth creation or a social benefit. Current theories take a much wider of the innovative processes, and recognize that the KMS is only one of several inputs to wealth generation and social progress within a complex socioeconomic system like a corporate. Our research has two main goals: 1) to explain the value of knowledge management and 2) to provide a general overview of measurement approaches.

There are a number of approaches that are increasingly being used to measure the value of, and progress in, knowledge and knowledge management in organizations. Some of the more common approaches are outlined in our article, with additional references and resources.

Kaplan and Norton founded a new concept to performance measurement frameworks with four broad perspectives: financial, customer, internal processes, and innovation. The framework was further improved as a strategic management system by Kaplan and Norton (2001). Neely and Adams, however, focus first on measuring stakeholders’ needs and contributions and then on the required strategies, processes, and capabilities. A lot more of Performance measurement frameworks exist, other than those mentioned, that are sometimes national in nature.

2 Measuring the Value of Knowledge Management

Measurement is undoubtedly the least developed aspect of knowledge management, which is not surprising given the difficulties in defining it let alone measuring it. In fact some practitioners feel that measurement is premature at this stage and that trying to

measure knowledge before you fully understand how knowledge is created, shared and used is likely to lead you to focus on the wrong things. Elaborate measurement systems, they say, cannot currently be justified because we simply do not yet know enough about the dynamics and impact of knowledge. That being said, in practice, few corporates have the luxury of being allocated resources to implement something without being required to demonstrate its value. Without measurable success, enthusiasm and support for knowledge management is unlikely to continue. And without measurable success, you are unlikely to be able to what works and what doesn't and therefore make an informed judgment regarding what to continue doing, and what to adjust.

2.1 Common measurement approaches

There are a number of approaches that are increasingly being used to measure the value of, and progress in, knowledge and knowledge management in corporate. Some of the more common approaches are outlined here for the purposes of providing a general overview.

a) Measuring the impact of knowledge management on the corporate performance. Given that the whole point of knowledge management is to improve the performance of the corporation and to help it to achieve its objectives, the best and most logical approach is tie-in measurement of knowledge management with the corporate overall performance measurement systems. This can be done either at an organizational level, or for individual projects and processes. However, one limitation of this approach is that if knowledge management practices are made an integral part of work, you cannot be sure of the relative contribution of those knowledge management practices to the success of a project or process, versus other factors. In view of this, O'Dell and Grayson [8, p.24] recommend a two-pronged approach that seeks to measure both outcomes and activities.

Measuring outcomes focuses on the extent to which a project or a process achieves its stated objectives. The success of the project or process serves as a proxy measure for the success of the knowledge management practices embedded in it. In other words, knowledge management is seen as an integral tool for improving a project or process, rather than as a separate thing. For example, outcomes might be measured in terms of the reduced cost of a process, improved efficiency, the reduction in time taken to do it, the improved quality of delivery, etc. Measuring activities then shifts the focus onto the specific knowledge management practices that were applied in the project or process. What were the specific knowledge management activities behind this practice and what was their effect? In measuring activities, you are looking specifically at things like how often users are accessing, contributing to, or using the knowledge resources and practices you have set up. Some of these measures will be quantitative ('hard') measures such as the number and frequency of hits or submissions to an intranet site per employee. However these measures only give part of the picture – they do not tell you why people are doing what they are doing. Hence to complete the picture, you will also need qualitative ('soft') measures by asking people about the attitudes and behaviors behind their activities.

b) The balanced scorecard

An increasingly popular approach to measuring a corporate performance, and one that is being widely adopted in knowledge management, is the balanced scorecard. The advantage of this approach in knowledge management terms is that it directly links learning to process performance, which in turn is linked with overall organizational performance. The balanced scorecard focuses on linking an organization's strategy and objectives to measures from four key perspectives: financial, customers, internal processes, and learning and growth. In contrast to traditional accounting measures, the balanced scorecard shifts the focus from

purely financial measures to include three key measures of intangible success factors. These roughly equate to the three components of intellectual capital – namely human capital (learning), structural capital (processes), and customer capital. The four perspectives can be framed as follows:

- *Financial*: How do we look to our ‘shareholders’ (or governing bodies)?
- *Customer*: How do our clients see us? Are we meeting their needs and expectations?
- *Internal processes*: What do we need to do well in order to succeed? What are the critical processes that have the greatest impact on our patients and our financial objectives?
- *Learning and growth*: How can we develop our ability to learn and grow in order to meet our objectives in the above three areas?

This knowledge management, which is about learning and growth, is measured as an integral and yet distinct part of overall organizational performance. The balanced scorecard approach can be applied to individual initiatives as well as to a whole corporate.

c) Return On Investment (ROI)

Most initiatives that require resources will be expected to show a return in investment – what benefits did we get to justify the costs involved – and knowledge management is usually no exception. The problem is that both the costs and the benefits of knowledge management can be notoriously difficult to pin down. While the costs associated with an investment in information technology can be relatively straightforward to identify, other costs can be less so, such as for projects that involve an amalgam of resources from across the corporate, or those inherent in challenging an organization’s culture. On the benefits side, how do you measure things like increased knowledge sharing, faster learning or better decision-making?

A number of approaches have been developed for showing financial returns on knowledge assets, such as that of Mark

Clare and Arthur Detore [7]. Such approaches tend to be rather complex, and therefore are probably more appropriate to organizations that are reasonably advanced in their knowledge management efforts, rather than just starting out.

d) The knowledge management lifecycle

Some corporate measure the progress of their knowledge management activities in terms of their maturity – how far ‘down the line’ they are in implementing knowledge management practices and ways of working. For Romania could be very important a Corporate Road Map to Knowledge Management Results. The aim is to provide corporate with a map to guide them from getting started right through to ‘institutionalizing’ knowledge management – embedding it in the organization and making it an integral part of the way a corporate works. The map has five stages: a) Get started, b) Develop a strategy, c) Design and launch a knowledge management initiative, d) Expand and support, and e) Institutionalize knowledge management. There are measures associated with each stage.

e) Employee surveys

Given the importance of people in knowledge management, employee surveys can be a useful additional to your measurement toolbox. Surveys can be used to assess aspects of organizational culture and the extent to which people’s opinions, attitudes and behaviors are, or are not, changing. Obviously such surveys measure people’s subjective perceptions and these may or may not reflect reality, but in many ways that can be their very benefit, as people’s perceptions will determine their behaviors with respect to knowledge management. In order to be effective, it is vital that any such surveys are carried out by people with the required expertise, whether that be through in-house capabilities or by hiring external consultants.

2.2 The steps in developing measures

Dhansukhlal & Chaudhry [4] outlines the following steps in developing measures:

a) Revisit the corporate goals

Your starting point for measuring any knowledge management initiative will be the original goals of that initiative: what is it that you set out to achieve? Developing measures will often lead you to get clearer about how you define the goals in the first place; if the goals are not concrete and clear enough, then measuring your success or progress against them will be difficult. Hence ensure that the goals define clearly what constitutes success in measurable terms.

b) Know the audience for the measures

In defining success, you will often find that different people have different ideas about what constitute success. Managers who approve the allocation of resources will want to know about the returns on their investment. Users of the knowledge management initiative will want to know how it has benefited them and whether their participation has been worthwhile. Other beneficiaries of the initiative, such as clients, will want to know how they have gained.

c) Define the measures

Define what exactly you are going to measure, and what measurement approach or approaches you intend to take. Ensure that your measures are:

- *Valid* - they actually measure what they are intended to measure rather than something else
- *Reliable* - they give consistent results;
- *Actionable* –they give information that can be acted upon if necessary.

d) Decide what information will be collected and how it will be collected

This is a process of ‘putting the meat on the bones’ – spelling out the details: what information will be collected, who will collect it, how, when, where, etc?

e) Analyzing and communicating the measures

When analyzing and presenting the results, be sure to refer back to the corporate original goals and audience. Aim to present results in a way that answers their questions in a meaningful way, rather than simply presenting facts and figures.

f) Review the combination of measures

Monitor and evaluate how these measures are working. Developing measures is a process of trial and error – don’t necessarily expect to get it right the first time. Similarly, remember that as objectives and situations change over time, so will your measures need to. Additional pointers emphasized by other practitioners include:

- Measuring for the sake of measuring is a waste of time – be sure that you are measuring for the specific purposes;
- The some kind of action or decision will be taken as a result of the measures;
- Focus on what is important. Trying to measure too much not only requires a great deal of work, it also tends to dilute the important issues;
- If the corporate already has a measurement system, then you can use those measures. If your knowledge management initiatives work, then you might assume that this will show up in your corporate other performance measures. There is no guarantee that existing measures are good ones.

3 Two of the KMS Effectiveness Models

Turban and Aronson [11] list three reasons for measuring the success of a Knowledge Management System:

- To provide a basis for corporate valuation;
- To stimulate management to focus on what is important;
- To justify investments in KM activities.

All are good reasons from an organizational perspective. Additionally, from the perspective of KM academics and practitioners, the measurement of KMS success is crucial to understanding how these systems should be built and implemented. To meet this need several KM and/or KMS effectiveness models are found in the literature. Here we presents several KM/KMS success/ effectiveness models. Two basic approaches are used to determine success. The first looks at the effective implementation of KM processes as the indicator of a successful implementation with the expectation that effective processes will

lead to successful knowledge use. These models identify KM processes by looking at KM/KMS success factors. The second approach looks at identifying impacts from the KM/KMS implementation with the expectation that if there are impacts from using knowledge then the KM/KMS implementation is successful. These models consider success a dependent variable and seek to identify the factors that lead to generating impacts from using knowledge. The following models, found through a review of the literature, use one or both of these approaches to determine KM/KMS effectiveness.

3.1 The Knowledge Value Chain

Bots and de Bruijn [5] assessed KM and determined that the best way to judge good KM was through a knowledge value chain.

Good KM is defined as using KM to improve corporate competitiveness. However, measuring KM impact on competitiveness is considered difficult so ultimately it was concluded that good KM is when the KM initiative matches the model provided in figure 1 and the KM processes are implemented well. KM is assessed for effectiveness at each step of the knowledge process and is good if each of the indicated activities is performed well with the ultimate factor being if the KM enhances competitiveness. Figure 1 illustrates the KM value chain. The model was developed by viewing and contrasting KM through an analytical (technical) perspective and a actor (user) perspective. These perspectives are conflicting and KM assessment occurs by determining how well the KMS meets each perspective at each step.

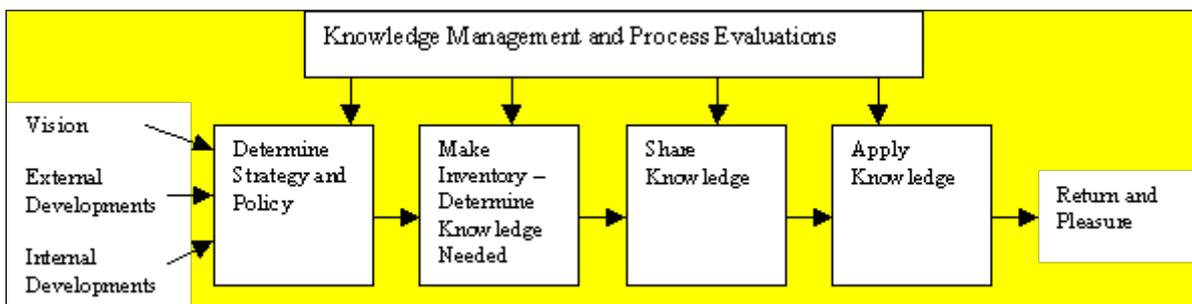


Fig. 1. KM Value Chain [5]

3.2 Jennex Olfman KMS Effectiveness Model

Jennex and Olfman (2004) present a KMS Success/effectiveness model that is based on the DeLone and McLean (1992, 2003) Information System Success Model. Figure 2 shows the KMS Success Model. This model evaluates success as an improvement in organizational effectiveness based on use of and impacts from the KMS. Descriptions of the dimensions of the model follow:

- *System quality* — defines how well the KMS performs the functions of knowledge creation, storage/retrieval, transfer, and application; how much of the Organizational Memory (OM) is codified and included in the computerized portion of the OM, and how the KMS is supported by the

Information System staff and infrastructure.

- *Knowledge/Information quality* — ensures that the right knowledge/OM with sufficient context is captured and available for the right users at the right time.
- *Use/User Satisfaction* — indicates actual levels of KMS use as well as the satisfaction of the KMS users. Actual use is most applicable as a success measure when the use of a system is required. User satisfaction is a construct that measures satisfaction with the KMS by users. It is considered a good complementary measure of KMS use when use of the KMS is required, and effectiveness of use depends on users being satisfied with the KMS.

- *Perceived Benefit* - measures perceptions of the benefits and impacts of the KMS by users and is based on perceived benefit model. It is good for predicting continued KMS use when use of the KMS is voluntary, and amount and/or effectiveness of KMS use depends on meeting current and future user needs.
- *Net Impact* - An individual's use of a KMS will produce an impact on that person's performance in the workplace. Each individual impact will in turn have an effect on the performance of the whole

organization. Organizational impacts are typically not the summation of individual impacts, so the association between individual and organizational impacts is often difficult to draw that is why this construct combines all impacts into a single construct. This model recognizes that the use of knowledge/OM may have good or bad benefits and allows for feedback from these benefits to drive the organization to either use more knowledge/OM or to forget specific knowledge/OM.

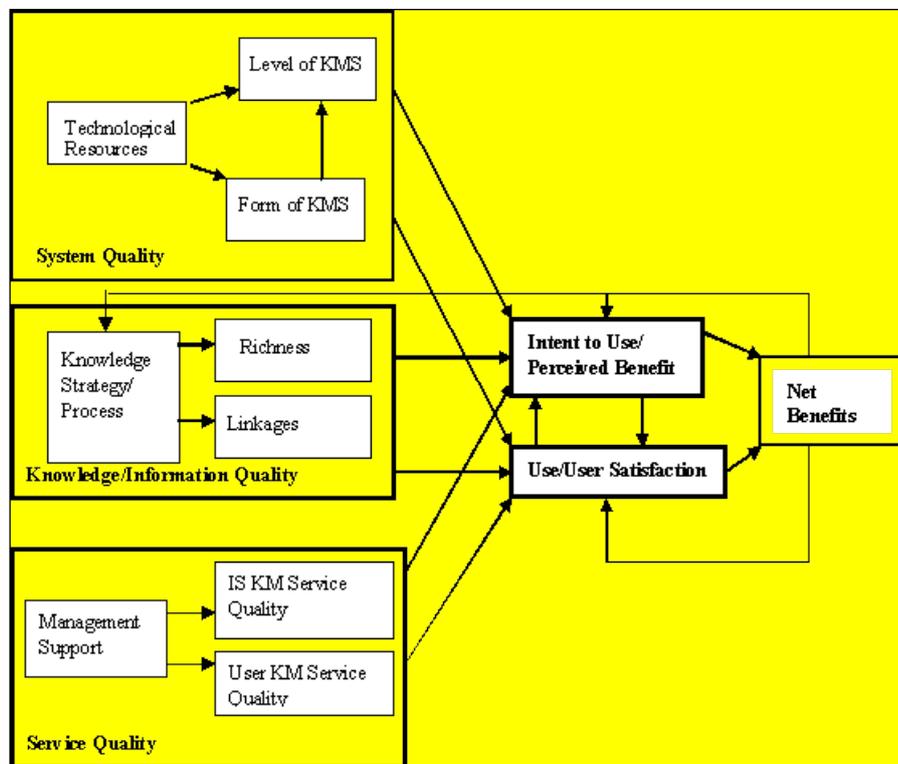


Fig. 2. KMS Success Model [5]

4 An Improved Framework for KMS Performance Measurement

As we know the goal of KMS is to discover, develop, exploit, disseminate, and share corporate knowledge [10]. To achieve each sub-goal of KMS, various types of approaches have been explored. Nissen [10] integrates Knowledge-Based Systems (KBS) and KMS via reengineering application in the field. He stresses the necessity and importance of integration of KBS and KMS from knowledge effects such as knowledge capture, organization, formalization,

distribution and application, but does not address the performance measurement of KBS and KMS.

To measure the performance of KMS is difficult because mental work may not be observable, the success of KMS is not predictable and performance can be measured only after a long period of time. In this section we propose an improved framework for KMS performance measurement model based on Balanced ScoreCard (BSC). The integration of BSC and KMS derives from the reasons that KMS

supports the foundation of corporate growth measured by innovation and learning perspective. Thus, initiative members can improve operation process, promote customer satisfaction, and increase financial revenue.

Because western corporate applies BSC and KMS, managers will usually prepare a set of Key Performance Indicators (KPIs) to measure progress towards the objectives of

corporate and KMS. The framework for developing KPIs is divided into three phases: 1) strategy, 2) analysis, and 3) process. Most recent studies aim at strategy step including how to set up corporate strategy and measurement systems. We will focus on analysis and process phases. The steps we use to develop the framework are described in figure 3.

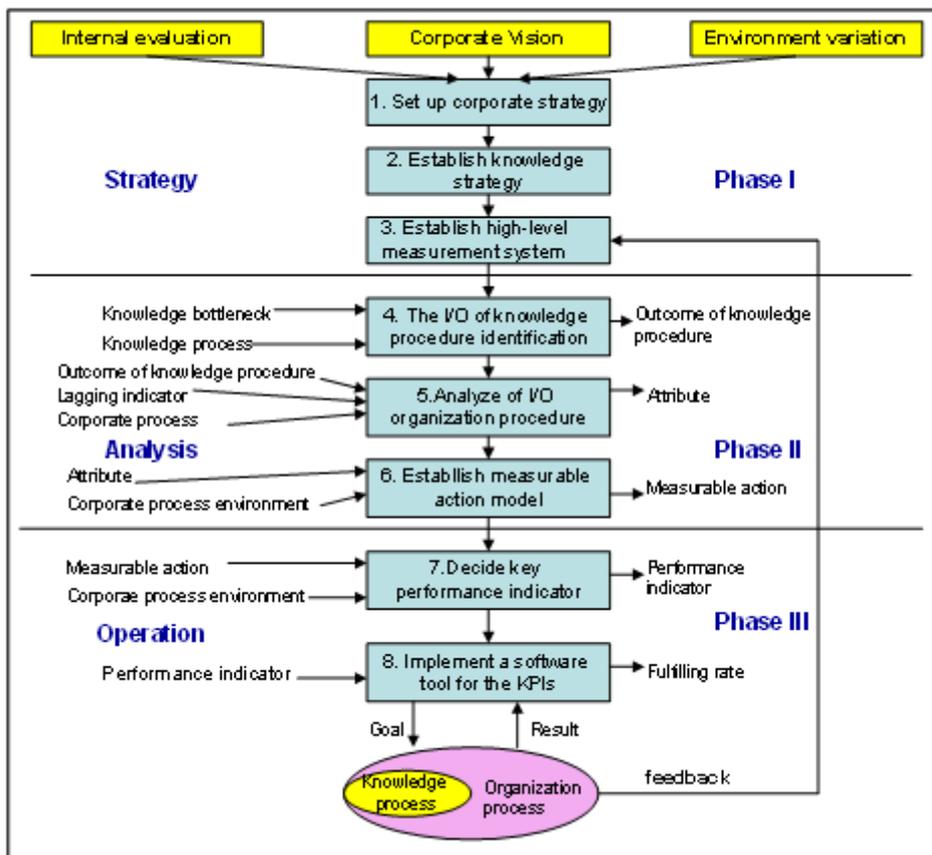


Fig. 3. An Improved Framework for KMS performance measuring [4]

In this framework, the modifications are twofold: 1) to integrate the corporate strategy and measurement system - a step of establishing knowledge strategy being added, 2) to implement the KPI in corporate process and knowledge process - a step of implementing a software tool for the KPIs being added. Sure, we clarified how to integrate knowledge process and corporate process for further analysis by KPI analytic framework. Under BSC structure, is easy to establishing the KPI of Knowledge Management Systems based on innovation and learning perspectives, which make

performance measurement applicably. Future research will clarify all dimensions of these improvements.

5 Conclusions

Whereas knowledge management continues to gain popularity into Romanian companies as a corporate strategy, the acceptance of standardized KMS assessment approaches has lagged. Developing metrics to asses a corporate KMS is inherently problematic due to the intangible nature of the knowledge resources.

The barriers to effective KMS measurement

are:

- KM executives forget to use measurement to increase the scope and reach of their activities.
- KM efforts often have secondary impacts that executives fail to account for.
- Many companies lack a standard definition of KMS.

Surely, the form of measurement of KMS performance will differ across organizational context. In some situations, a complete valuation is needed, whereas in others less measure may be adequate. The challenge for management is to find the right mix for each specific company or program.

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