

Developing an Instrument for Knowledge Management Project Evaluation

Zuhair Iftikhar,
Univeristy of Turku, Finland.
zuifti@utu.fi

Inger V. Eriksson & Gary W. Dickson,
North Carolina State University, Department of Business Management, USA,
inger_eriksson@ncsu.edu, gary_dickson@ncsu.edu

Abstract: Many knowledge management (KM) projects have been initiated, some of which have been successes but many have been failures. Measuring the success or failure of KM initiatives is not easy, and in order to do so some kind of measurement process has to be available. There are three points at which evaluation of KM projects can, and should be, done: (1) when deciding whether to start and where to focus, (2) once under way, following up on a project and making adjustments if needed, and (3) when completed, to evaluate the project outcomes. This paper concentrates on the first two areas by developing a general instrument for evaluation of KM projects.

Keywords: Knowledge management, Evaluation process, Measurement instrument, Success factors.

1. Introduction

Nonaka contends that Japanese firms are successful because they are innovative (Nonaka 1995). In particular, they are able to create new knowledge and use it to produce successful products and technologies. Management consultants took up this argument and began to preach it to companies in the United States, Europe and the Far East. Soon, companies started to adopt new initiatives focusing on managing knowledge. After introducing these knowledge management (KM) initiatives, which was a complex process itself, came the need for measuring their effectiveness. Unless evaluation is done there is no way to gauge the direction in which the KM initiative is heading. In case the KM initiative is going in the wrong direction corrective action could be taken to put it on the right track but this requires that there is some measure indicating the risk. The problem is that measuring KM initiatives is anything but a trivial task. Another problem encountered is that there is not much literature focusing on evaluation of KM initiative implementation.

In this paper, process evaluation and its dependent factors are discussed first and their application to KM is considered afterwards. A KM project evaluation instrument is developed and presented. The central factors associated with good KM project practice included in the evaluation instrument are: organisational environment, technical and managerial support, utilisation of knowledge and technology, existence of strategy and goals for KM projects. It is proposed that using this instrument an organisation can get a feel for

their strengths and weaknesses regarding their KM initiatives. The authors argue that, for KM project evaluation purposes, each organisation planning to test such an instrument should include only those factors, which are determined to be critical in their KM environment.

2. Evaluation of business processes

This paper deals with KM projects, which are a kind of business projects, and how to evaluate them. Thus some more general definitions of basic concepts are useful. A business process is any broad collection of activities within a company whose ultimate goal is to improve the performance of the company e.g. KM initiative projects, Change management, Quality management, Customer relationship management, Supply-Chain management, and Marketing. In the following subsections some definitions of the process itself and its evaluation are presented:

2.1 Definitions

Evaluation of business processes has emerged over the past few years as a valuable management tool. It is based on the systematic collection of information about business processes, projects, initiatives, products, personnel and programs. Evaluation of processes allows us to understand how things could be done as seen from a novel perspective compared to the existing way of doing things. It helps in revealing problems and bottlenecks, to clarify options, reduce uncertainties, and provide information about programs, policies and processes within

contextual boundaries of time, place, values and politics (Quinn 1990).

Talwar defines a process as (Talwar 1993): *a sequence of pre-defined activities executed to achieve a pre-specified type or range of outcomes.*

According to Ould there are two types of processes (Ould 1995):
the sort that starts when necessary and finishes some time in the future;
the sort that are running constantly.

When it comes to evaluation of processes which is an important part of this discussion, two definitions are offered below.

UNICEF (1991) defines evaluation as, *a process which attempts to determine, as systematically and objectively as possible, the relevance, effectiveness, efficiency, sustainability and impact of activities in the light of specific objectives.*

In this paper we rely and base our discussion on these definitions.

2.2 Importance of evaluation of business processes

Academics and practitioners have realised the need for the evaluation function within business processes, and very recently have been focusing on the use of evaluation as a strategic tool for knowledge and information acquisition and construction with the aim of facilitating decision making and organisational learning (Segone 1998). Sherwood-Smith (Sherwood-Smith 1994) states that evaluation supports informed decision making which is necessary in every stage of any business process initiative. By gathering information and generating knowledge, those involved in or affected by the business process have the opportunity to understand the issues involved in the process.

Another advantage of evaluation is knowledge construction and capacity building (Segone 1998). Evaluation facilitates the process of knowledge transfer to similar situations. According to Segone lessons are transformed into knowledge when they are analysed, disseminated and internalised within an organisation through evaluative processes. Therefore, evaluation can be used in a business process as a tool to gather information, systematise the lessons learned and then disseminate this information to

facilitate similar projects, processes, or change initiatives in the future (Vakola 2000).

2.3 Factors in evaluating business processes

Evaluation and dissemination of lessons learned is crucial in every business sector (Boyd & Robson 1996). Consequently, evaluation of lessons learned is important throughout the KM initiative processes because it can impact on decision making during all stages of the process. To ensure successful process development, the following key factors are to be considered:

- Existence of a plan as to how to introduce and manage a process.
- Ensuring commitment from both management and personnel.
- Identification of activities to focus upon within a business process and deciding how to do the data collection accordingly.
- Fostering communication to help to increase involvement and commitment.
- Increasing the understanding of problems/success factors and refining ideas based upon lessons learned.

In case of KM initiatives, there are other central factors as well, i.e. socio-technical environment (Coakes 2000; Segone 1998). The social environment of the organisation and its information technology set-up can play a crucial role in fostering a knowledge intensive environment.

3. Knowledge Management (KM)

Knowledge is an expensive commodity, which, if managed properly, is a major asset to the company. In the workplace of the future, the fiercest competition apart from the customers may be for the hearts and minds of employees. Most companies invest in their knowledge assets by recruiting knowledgeable people in the first instance and then further by training them. The company can gain competitive advantage by retaining and managing the in-house knowledge to help to exploit the business advantage. It is not only the employee who walks out of a door on leaving an organisation. The most expensive asset i.e. working knowledge also leaves the organisation with the employee. Working knowledge which includes factors such as intuition, wisdom, experience, numerous undocumented insights and informal networks is hard to gain but can be easy to lose. The

Economist (Sept 8th 2001), comparing differences between Nokia and Ericsson states that

Most managers recruited by Nokia have stayed with the company. That is quite different from Sweden's Ericsson, whose management has sprouted a string of entrepreneurs eager to branch out, frequently with unfortunate results.

3.1 Definition

Knowledge is complex and controversial, and can be interpreted in many different ways. Much of the KM literature sees knowledge in very broad terms, covering basically all tacit and explicit aspects of an organisation's knowledge. This includes structured data, patents, programs and procedures, as well as the more intangible knowledge and capabilities of people.

KM encompasses the way that organisations function, communicate, analyse situations, come up with novel solutions to problems and develop new ways of doing business. It can also involve issues of culture, custom, values and skills as well as relationships with suppliers and customers. There is an abundance of definitions about knowledge and KM. A few basic definitions are provided before the evaluation of KM initiative process is discussed.

According to Davenport & Prusak (Davenport & Prusak 1998):

Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in the documents and repositories but also in the organisational routines, processes, practices, and norms.

Knowledge can be viewed both as an object to be stored and manipulated and as a process of simultaneously knowing and acting - that is, applying expertise. As a practical matter, organisations need to manage knowledge both as an object and a process.

KM is potentially difficult to define and measure because it is complex, multi-dimensional, and process-oriented. KM is also a critical component of effective group performance in a number of domains, including consultancy,

law, local government, aviation, medicine, and the military. Given this complexity, it may be necessary to create several operational definitions, one for each of the various knowledge measurement dimensions and processes.

Although a fair amount of research has been devoted to the development of KM, much less effort has been devoted to the evaluation of KM initiative processes. Evaluation is important for example, to determine whether the organisation's investment pays off in terms of demonstrable performance improvements. In many domains, however, changes in performance are difficult to measure because of uncontrollable factors that exist within the larger organisational context.

4. Evaluating KM: Instrument Development

Evaluating KM initiatives as a special case of business processes is proposed to be of critical interest. A general instrument for measuring the success of KM projects is developed and presented below. The instrument allows one to see how advanced and prepared an organisation is with respect to KM initiatives. The instrument is composed from two sources: Firstly, issues raised in various academic research and business articles regarding KM, and secondly, various questionnaires on the Internet (KPMG 2001). The instrument also encompasses issues related to business management in general. The purpose of this instrument is not to measure the concrete results and outcomes of a KM initiative; rather it is to gauge the status of an existing or about to begin KM initiative. Based on the findings organisations can home-in on the problem areas and conduct further investigation to find more suitable approaches. The instrument is in the form of a questionnaire to be distributed internally within the organisation planning or conducting a KM project. The questions are intended to encourage thinking and finding information on which KM is based, directly or indirectly. The most central factors associated with good KM project practice are included. These factors cover organisational environment, technical and managerial support, existence of strategy and goals for KM projects, utilisation of knowledge and technology. Sample questions are suggested for each group of factors. To find the strong and weak areas e.g. a Likert type of scale could be used when answering questions. Note that the questions implied are a sample of possible questions. Each

organisation has to identify what is relevant for them and add and delete questions as well as reformulate them to fit their purposes and context. In the following we briefly discuss the key areas for each factor mentioned above.

4.1 Organisational Environment

We have chosen to introduce the questionnaire by presenting issues related to the organisational environment. Often KM projects are considered technical projects with emphasis on utilising technology to solve KM problems. We do not underrate the role technology can play in KM, but by starting with organisational issues we will point to the importance of a knowledge friendly atmosphere for such projects to succeed. Under this factor the following key areas are discussed: social aspects, culture, incentives, and trust issues. The areas discussed will overlap to a certain extent and it is not too useful to try to keep the different areas all distinct.

4.1.1 Social Aspects

As mentioned in the beginning knowledge should be seen, discussed and developed not just as a technical artefact but in the light of social environment within which it is used. The real information system is built on organisational culture and interpersonal communication. Innovation within companies can be addressed by thinking of it as a social process. According to Hansen KM is about people, their work practices and their work culture (Hansen 1999). An analogy can be drawn with rowing crews. The boats only gains speed when all the rowers are in sync with one another, otherwise the boat loses momentum. The following questions try to capture how these issues are experienced in the company.

1. All employees are ready and willing to give advice or help on request, from anyone else in the company (Inkpen 1996).
2. Informal networks across the organisation are encouraged.
3. Multi-disciplinary teams are formed and managed.
4. Staff is rotated to spread best practice and ideas, or the natural internal staff turnover is actively capitalised upon in this regard.
5. Training is available for those who want to improve their communication skills.
6. Management uses different means to facilitate knowledge dissemination and

creation e.g. mentoring programs, project debriefing, learning games, training programs, story telling etc...

7. There is a strategic program in place to collect and analyse business intelligence information to assist with business strategy development.
8. Technology is shared with suppliers/clients where appropriate to enhance relationships (Davenport & Klahr 1998).
9. There is a program of active participation in business conferences and other discussion forums to share and learn ideas and experience.

4.1.2 Culture

Organisational culture reflects the behaviour within an organisation, which either enables or hinders effective KM. Every organisation has its own culture which has an influence on the way people work. The importance of interaction between employees cannot be understated and thus it is imperative that the culture does not hinder the interaction, which forms the basis of knowledge creation.

1. Failure is not stigmatised, rather it is seen as an opportunity to learn (Lucier & Torsilieri 1997).
2. Recording and sharing knowledge is routine and second nature to promote continuous knowledge exchange.
3. Looking for the best practice, or work that can be re-used is a natural, standard process.
4. Knowledge sharing is seen as a strength, knowledge hoarding as a weakness.
5. Time is allowed for creative thinking.
6. Employees are encouraged to learn more and develop themselves.
7. There are no restrictions on access to information unless it is confidential or personal.
8. A common language exists for exchanging and clarifying information to people with different backgrounds.
9. Efforts are made to combine the ideas of different cultures within the organisation (Nonaka 1998).

4.1.3 Incentives

These questions are aimed to show whether the organisation properly rewards those who support the efforts towards KM. Employees give their maximum output when their efforts are recognised and appreciated (Davenport, de Long & Beers 1998). Incentives should be

used to encourage employees to repeat their performance and aim for even better results.

1. Good KM behaviour (e.g. sharing, re-using etc.) is actively promoted on a day-to-day basis.
2. Bad KM behaviour (e.g. hoarding, not using best practices etc.) is actively discouraged.
3. Good KM behaviour is monitored and built into the appraisal system.
4. Individuals are visibly rewarded for teamwork, knowledge sharing and re-use and re-use of knowledge.
5. Training and development programs in KM behaviour and procedure are encouraged from point of recruitment onwards.

4.1.4 Trust Issues

1. Knowledge sharing and willingness to take the time to help others is based on trust and confidence. The importance of trust in the exchange of information cannot be overstated in an organisational context. Trust enables strengthening of interpersonal communication. The following questions cover some of these issues.
2. People are engaged in decisions that directly affect them.
3. Explanation is given about why decisions are made the way they are.
4. Expectations from the employees after changes are stated clearly.
5. Work groups see themselves as interdependent with others outside their team.
6. When it comes to problem solving, groups and/or individuals regard themselves as part of a larger, integrated entity.
7. People are genuinely interested in helping one another to develop new capacities for decision making.
8. There are different personality types within the organisation that allow people to cluster into groups of compatible types.
9. Usage issues (e.g. experts' willingness to use databases or share their knowledge) are understood by management.

4.2 Technical and Managerial Support

Next we discuss the managerial and technical support that is required for successful KM projects. KM initiatives can be started based strictly on the availability of new technology.

However, if the managerial support is missing even a successful project might fail when it comes to utilisation of the system in the long run. In other words the project might be successful, but the program fails. Two areas are discussed here: (1) organisational structure, and (2) awareness and commitment.

4.2.1 Organisational structure

This topic addresses the degree to which the organisational structure supports KM (Blackler 1995). Knowledge-based organisations are associated more with networks and teamwork rather than the traditional bureaucracies. This condition reflects the fact that the availability of knowledge depends on organisational structure. In a hierarchical system information mostly flows vertically, while in a matrix type of organisation information flows both vertically and horizontally. In a network type of organisation the direction is based on the need. The issue of what knowledge is needed and where it is used in an organisation is very complex. Knowledge has different uses by different people in different situations, and the issues of transfer and interpretation of that knowledge are considerable. The questions try to uncover the situation.

1. Formal networks exist to facilitate dissemination of knowledge effectively.
2. A flexible, well-structured, up-to-date knowledge map exists to point staff in the direction of the knowledge they seek.
3. Information useful for different units is available to a number of different users in different formats.
4. A Chief Knowledge Officer (CKO) is in place, and effective with the appropriate degree of authority to facilitate knowledge creation.
5. There are a number of dedicated knowledge workers in place to support and assist the knowledge processes (i.e. creation, storage, dissemination etc.).

4.2.2 Awareness and Commitment

This subsection covers the interest an organisation shows in its KM endeavour. The questions investigate whether staff understands the concept of KM and whether senior management is committed to its use. The more business functions are linked and share information, the better the company will be able to tap into the knowledge of its workforce. Good support at the highest level helps not only in getting the projects off the

ground but also provides support after their commencement.

1. At all levels there is a general understanding of KM, with respect to how it is applied to the business.
2. Business functions e.g. Customer Service and Support, Human Resource, Information Technology, Learning and Training, Project Management etc. are related with KM.
3. KM is given representation at the board level by creating an extra seat on the company's board of directors.
4. Senior management demonstrates commitment and action with respect to KM policy, guidelines and activities.
5. Senior management supports knowledge sharing, learning and other desired 'KM' behaviour.
6. At the senior level there is an ongoing review of the effectiveness of KM for the whole company.
7. Intellectual assets are recognised and valued.
8. Senior management has a good understanding of the skills of their staff.

4.3 Strategy and Goals for KM Projects

Strategy and goals are areas closely related to the previous factor. They show whether the organisation has committed to a program of KM improvement and how this program is managed to ensure business benefit. KM should always be considered in its business context and measuring the effect in business terms is the most important, although very difficult, task. In this paper we do not attempt to do this kind of measuring but restrict our efforts to measure the project success only. Still, strategy and goals for KM projects should be considered at this level. By its very definition a strategy lays out an action plan, which can be followed by employees. Strategy helps in clarifying minute details relating to the initiative.

1. KM projects have already been initiated.
2. There is a vision for how KM should integrate into the business.
3. It is clear how KM initiatives support the business plan.
4. There are defined responsibilities and a budget set for KM initiatives.
5. KM principles are set (e.g., definitions of key knowledge and guidelines for knowledge creation and management).

6. There is clear ownership of KM initiatives, either by the business unit or the whole business.
7. There is a program of initiatives in progress to improve KM.
8. There is a close relationship between the strategic program and the learning program within the organisation.

4.4 Utilisation of Knowledge and Technology

Collecting data and extracting information from the data is a central and for organisations, but these tasks by themselves are not KM. Data and information management, most organisations are quite experienced with and good at. Only when information is turned into knowledge by applying and using it we can talk about KM. In this section we are looking for the role of information technology in the KM process, the need for continuously maintaining and protecting organisational knowledge, and the basic issue of using and applying knowledge.

4.4.1 Information Technology

Information technology provides one of the strongest focuses of KM developments, and a wide range of systems offering capabilities in KM should be promoted. Despite the many impressive benefits that information technology has clearly brought, there is great concern about major problems that arise, especially with large complex systems. There is also the overconfidence on technological solutions to take into consider. In this subsection we attempt to identify whether the information technology (IT) in place is sufficient and used effectively enough to support KM.

1. People use existing IT effectively as normal working practice.
2. IT is leading edge and is fully supported.
3. Technology is a key enabler in ensuring that the right information is available to the right people at the right time.
4. IT makes the search for information easier.
5. IT allows effective communication across boundaries and time zones.
6. Process tools and technologies are related to KM.
7. There is investment in infrastructure development to support groupware and collaborative computing tools.
8. Information is used to make sense of changes in the environment, create

new knowledge and/or make decision about a course of action.

4.4.2 Maintenance and Protection

Maintenance operations for adapting to changes in the product or production environment should be in place. Increasingly sophisticated technology demands highly skilled and knowledgeable people to ensure it consistently operates to the highest standards, so that product quality is not compromised. If data, information and knowledge assets are not maintained, they deteriorate much as any other assets and become useless. Thus it is important to know how well the organisation protects and maintains its information and knowledge.

1. There are regular reviews to delete out of date information and ensure regular updates from designated information owners.
2. Effective cataloguing and archiving procedures are in place for document management, whether held electronically or not.
3. Key information to be protected, such as customer information, is identified and measures are in place to ensure it stays in the company should key employees leave.
4. Intellectual assets are legally protected.
5. There are complete IT security procedures in place (backup, recovery etc).
6. Regulatory and compliance requirements are clearly published and understood; they are monitored to ensure compliance.

4.4.3 Using and Applying Knowledge

The main purpose of KM is to ensure that the business actually uses and exploits the knowledge inherent in the company in an effective manner. One simple reason why a company should use inherent knowledge is that it is already within the company and if it remains untapped it is going waste. Also lessons learned should be incorporated within the company without delay to improve the stock of knowledge. The purpose of this subsection is to identify how well the company uses and applies its knowledge.

1. To improve decision making, critical knowledge is elicited and prioritised.

2. Ideas to exploit pools of information are reviewed and acted on for potential business benefit.
3. Best practice in internal methods are reviewed and propagated.
4. Knowledge provision is targeted towards major decision points in key business processes.
5. Use of knowledge and information is controlled in line with regulatory and compliance requirements.

To conclude, this instrument is presented as a sample and each individual organisation is encouraged to change it according to its own needs and limitations. The factors that were mentioned above are those which organisations should focus on when going into a KM initiative. The presence of these factors in a KM project indicates an opportunity for a successful project and process, whereas the absence of these factors is suggested to lead to project failure. More questions and sections can be added or removed to customise the instrument for the needs of a particular organisation. Based on the results of the assessment action should be taken at senior levels to further improve business operations via KM.

5. Summary and Conclusion

The paper begins with a brief introduction to KM and the evaluation of business processes. Then factors for evaluating KM initiative processes are presented. Following, a sample instrument for basic data collection for KM assessment is developed. An underlying message has been to advocate the feeding of the results of the measurements back into the business/development cycle for gaining real benefits. The instrument provided is intended to be a starting point and it is up to each individual company to modify the instrument to fit their business goals. Based upon the findings of the instrument, further investigative studies can be taken regarding problem areas. Further studies can allow focus on some specific industries to get the status of KM across the whole industry. Additionally a regional analysis of KM initiatives can be undertaken. Research could also be done on the success/failure factors of KM initiatives and on developing a dynamic KM model to be used by different organisations. Another study could be done about evaluating which factors are common among different organisations and why this should be the case.

Measurement is essential to making the value of knowledge accessible to managers and others who need to justify expenditures in some concrete way. While several different approaches are available for evaluating the effectiveness of a KM initiative, certain principles remain invariant. For example, the primary objective is to determine (1) if a KM initiative makes a noticeable difference in the dependent variables, and (2) the magnitude of the effect. The aim of the instrument presented in this paper is to focus primarily on the KM initiative process rather than on measuring the business process outcome. Measurement of process outcomes is important enough in its own right to be treated separately. It also requires an entirely different approach. Metrics for measurement of outcomes of a KM initiative will be a topic for further research and investigation and the next paper.

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