Understanding Strategic Success Factors for Implementing Knowledge Management in Business Process Management Through the Analytic Hierarchy Process (AHP)

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Abstract

Today, with ever increasing use of knowledge as a critical resource one of the most important matter that all the organization face is The issue of knowledge management. Due to a various efforts for introducing the Business process concept to knowledge management (KM) or the knowledge concept to business process management (BPM) in order to combine the advantages of the two paradigms, certain strategic factors for development of this relation is not yet identified. There is a lack of mechanisms for knowledge capturing, storing and disseminating in business process management. The aim of our study is to identify strategic success factors for KM in all organizations on a broad empirical basis. The paper employs the analytic hierarchy process (AHP), a quantitative method of decision-making, to evaluate the strategic factors of four KM suggestion method via criteria, sub criteria and variety of options in mind, consistent with the literature and help of expert team. The result shows that the technological factors, which have an overall weight of 48%, play a predominant role in experts’ choice of KM strategies.

Keywords: Knowledge Management (KM), Business Process Management (BPM), Analyzing Hierarchical Process (AHP)

Introduction

In the last decade, the importance of knowledge has been high-lighted by both academics and practitioners (Wu, I., &Lin, H, 2009). Nowadays, knowledge is the fundamental basis of competition (Zack, M.H,1999),(Grant, R.M,1996) and, particularly tacit knowledge, can be a source of advantage because it is unique, imperfectly mobile,
imperfectly imitable and non-substitutable. (Carolina López–Nicolás, 2011) However, the mere act of processing knowledge itself does not guarantee strategic advantage; instead, knowledge has to be managed (Zack, M.H, 2002). In the next years, firms that create new knowledge and apply it effectively and efficiently will be successful at creating competitive advantages. Knowledge management (KM) defined as ‘the explicit and systematic management of vital knowledge and its associated processes of creation, organization, diffusion, use and exploitation’ (Skyrme, D, 2001). KM principles have been studied and implemented in every organizational discipline and (Kebede, G, 2010). This diversity has contributed to the rapid advance of the field, but also to a lack of integration of ideas and terminology (Clarke, J., 2004). In this situation, there are several challenges to establishing KM as a separate discipline (Kebede, G, 2010).

From a practice perspective, firms are noticing the importance of managing knowledge if they want to remain competitive (Zack, M.H, 1999) and grow (Salojärvi, 2005). Thus, many companies everywhere are beginning to actively manage their knowledge and intellectual capital (De Tienne, 2004). Unfortunately, many KM systems have been unsuccessful (Storey, J, 2000). Reporting failure rates of over 80%, due to diverse reasons, such as an over focus on IT, inappropriate KM strategies, or ignorance of KM consequences. Now that technologies implemented to enhance knowledge sharing have matured, researchers and practitioners are able to reflect on the factors of their success or failure (Hall, H, 2007). Besides, a divergence in the practitioner’s view on KM and the academic perspective is already evident (Clarke, J., 2004), and an increasing feeling of disappointment in managers due to their inability to foster organizational knowledge.

In spite of all advances in these perspectives, the result has been an incomprehensible and confusing body of knowledge and many managers do not still know which variables can improve KM programs success (Moffett, S., 2002).

In addition, there have been various efforts to introduce the process concept to knowledge management (KM) or the knowledge concept to business process management (BPM) in order to combine the advantages of the both (A. Berztiss i, 2000), (I. Choi, 2004), (J. Lai, Y. Fan, 2002). Recently, several conferences on the concept of process oriented knowledge management (PKM) system, including a dedicated conference, have been held (J. Lai, 2002), (http://www.dke.univie.ac.at/PAKM2002/). Comprehensive research and development requirements along with a cogent framework, however, have not been proposed for integrating KM and BPM. Based on a comprehensive framework that reflects lifecycle requirements of both KM and BPM (I. Choi, 2004), (Jisoo Jung, 2007).

This paper proposes strategic factors to implement knowledge management systems (KMSs) and business process management systems (BPMSs) to combine the advantages of them. By studying documents and doing interviews with the experts we can find optimal parameters. The indicators in three groups () were classified as possible solutions for the
development and use of knowledge management in business process management with strategic factors they considered to be launched. These strategic factors, can assist managers to exploitation of knowledge management in business processes

We probe the question of what KM strategies are adequate for the e-business environment. We hypothesize that, in addition to technological considerations, economic and organizational factors play an important role in the popularity of using KM. This paper begins by describing four KM strategies and defining the technological, economic, and organizational factors that characterize these systems. It then delineates the presumptions and procedures to conduct the analytic hierarchy process (AHP). To test our hypothesis, AHP is used to obtain the relative weights among the sub factors and the total values of each KM strategy based on these weights. An ordinal ranking based on the total value gained by each KM strategy determines their relative performance. Based on our analysis of the results, we suggest policy alternatives.

Related Work

The study described in this paper is part of efforts toward Using Knowledge Management in BPM (De Tienne, 2004). The purpose of this research is to integrate processes and to provide lifecycle support for process modeling and integration, process analysis and optimization, process automation and control, process-oriented integration, and process knowledge management (I. Choi, 2006). The concept of BPMS proposed by Business Process Management Initiative (BPMI) is to integrate systems, automate routine activities, manage all phases of processes, deploy process seamlessly, and provide end-to-end visibility and control (S. Smith, 2002). BPMI, an international organization setting standards on BPMS, was initiated in 2000 (http://www.intalio.com). At this stage, however, it does not address issues for management of process knowledge or knowledge management from the business process perspective. Various studies were carried out in order to integrate KM and BPM. The Delphi group defined process knowledge as the collection of tacit and explicit knowledge for effective execution of a process (http://www.delphigroup.com). A knowledge retrieval agent provides related knowledge to the users automatically by executing predefined query when the process is executed. In the MILOS project, a process knowledge management scheme was proposed which instantiates a business process from an existing process template that contains all experiences used to develop software systems (M. Klusch, 1999), (M.M. Kwan, 2003). In the MOKA project, activities can be defined as one of the knowledge elements and can be linked with other knowledge elements including illustrations, constraints, other activities, rules and entities (K. Oldham, 2005). The EDEN tool supports high level control over the project by allowing team members to follow pre-defined processes and to use relevant information, experiences, and knowledge captured by other team members (http://indutech.co.za), (N.
The advantage of process-oriented knowledge management is that it can help users avoid information overload and concentrate on important information which is essential for company value chains (M.M. Kwan, 2003). It can also improve the usability of knowledge in company and the efficiency of implementing knowledge management system (U. Remus, F. Lehner, 2000).

There have been attempts to integrate knowledge and processes for various disciplines such as software development, project management, and product design. For example, research on design process history deals with knowledge based modeling procedure, acquisition and distribution of knowledge during design processes. Recent efforts to integrate KM and BPM may be considered as a generalization of these earlier works, regardless of process types. (L. Horvath, 1997) (G. Toye, M.R. Cutkosky, 1994)

Another stream of research is to manage process as intellectual asset, including the Process handbook project of MIT, Deva’s PKMS, the AIS project, and Kontext Navigator (H.D. Jørgensen, 2000), (W.M.P. van der Aalst, 2003), (M. Eppler, P. Seifried, 1999). In MIT’s Process handbook, users can easily find target processes since processes are stored according to both classification method and grouping method (Deva Industries, 2000). Deva Inc.’s PKMSTM (Process Knowledge Management System) supports flexible process modeling (Deva Industries, 2005). It has sixty basic process models which span eight business functions. If a user wants to design a new process model, he or she can easily create it by assigning new resources to an existing process model. In the AIS project, users can add their know-how to process models by creating business processes dynamically (H.D. Jørgensen, S. Carlsen, 2000). The Kontext Navigator project developed a process navigation tool which retrieves proper knowledge from the process knowledge combined with context information (T. Goesmann, KontextNavigator, 2001). Other research includes Allweyer (T. Allweyer, 1999), Berztiss (A. Berztiss, 2000), Lai and Fan (J. Lai, Y. Fan, 2002).

As previously mentioned, comprehensive research and development requirements along with a cogent framework for knowledge management and business processes management have not been proposed. Further, to manage knowledge and business processes as corporate intellectual assets, their lifecycle requirements must be properly defined. Existing research and development efforts to combine KM and BPM have focused on only certain issues out of the whole lifecycles.

**Business Process Management & Knowledge Management Lifecycle**

Before defining the concept of process knowledge, this section discusses the BPM lifecycle and the KM lifecycle in which processes and knowledge are created and managed, respectively. Paying attention to the lifecycle not only enhances the understanding of the concepts but also helps to find requirements of process management and knowledge
The BPM lifecycle of IPM consists of six phases: creation, modeling, pre analysis, enactment, post analysis, and evolution. A business process is created by process designers that have broad knowledge about enterprise processes. When constructing a new business process, process designers discuss with process/activity performers such as workers, customers, and business partners in order to synthesize and analyze diverse requirements and opinions. The created process is defined as a process template with a process modeling language. In the pre analysis phase, the process template can be optimized by applying various process analysis techniques including structural analysis techniques such as PERT/CPM and simulation techniques such as Petri-net. These three phases are called ‘design phase’ or ‘build-time’ in the WfMC standard (WFMC-TC-1011, 1999). During the enactment phase, process instances are generated from their templates and stored in the database by workflow engines or BPM engines. They are analyzed in the post analysis phase and the process template (for the instances) is evolved according to the results of post analysis. Fig. 1 shows the Comparing Cycle of BPM with KM

![Figure 1. Comparing Cycle of Business Process management with KM](image)

**Strategic KM**

Strategic KM relates to the processes and infrastructures firms employ to acquire, create and share knowledge for formulating strategy and making strategic decisions. Thus linking KM strategy to business strategy (Zack, M.H,2002). A firm’s knowledge strategy describes The overall approach an organization in tends to take to align its knowledge resources and capabilities to the intellectual requirements of its strategy, thus reducing the knowledge gap existing between what a company must know to perform its strategy and what it does know (Zack, M.H,1999). A similar definition is provided by (Bierly, P.,&Daly,P,2002), which state that “the set of strategic choices addressing knowledge
creation in an organization comprise the firm’s KM strategy, which provides the firm with guidelines for creating competitive advantage”. Both definitions take account of the convenience of explicitly managing knowledge with a clear knowledge strategy. However, the KM strategy is often adopted in an unconscious way (Garavelli, C, 2004). Firms must take a global and consistent vision when managing its knowledge and selecting KM tools to be implemented. The whole organization must share a common KM orientation because KM is central to their ability to grow and compete (Salojärvi, 2005).

A better understanding of the concept and implications of KM strategies can be achieved through the view of most important contributions (Table 1).

Table 1

<table>
<thead>
<tr>
<th>Author</th>
<th>System-oriented</th>
<th>Human-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansen et al. (1999)</td>
<td>Codification</td>
<td>Personalization</td>
</tr>
<tr>
<td>March (1991)</td>
<td>Exploitation</td>
<td>Exploration</td>
</tr>
<tr>
<td>Bierly and Chakrabarti (1996)</td>
<td>Exploiters</td>
<td>Innovation, explorers</td>
</tr>
<tr>
<td>Zach (1999)</td>
<td>Conservative</td>
<td>Aggressive</td>
</tr>
<tr>
<td>Choi and Lee (2003)</td>
<td>System-orientation</td>
<td>Dynamic, Human-orientation</td>
</tr>
<tr>
<td>Martini and Pellegrini (2005)</td>
<td>Codification</td>
<td>Network-based; Traditional</td>
</tr>
<tr>
<td>Mom, Van Den Bosch, and Volerda (2007)</td>
<td>Exploitation</td>
<td>Exploration</td>
</tr>
<tr>
<td>Moitra and Kumar(2007)</td>
<td></td>
<td>Socialization</td>
</tr>
<tr>
<td>Wu and Lin (2009)</td>
<td>Copier, continuous improver</td>
<td>Skill acquirer, innovator</td>
</tr>
</tbody>
</table>

An essential element is the balance firms should observe between exploration and exploitation, i.e. between the creation, discovery or acquiring of knowledge and its refinement, reuse or a focus on efficiency in knowledge resource management. This paper labeled firms according to the way they manage knowledge (Bierly, P, 1996). They conclude that more aggressive knowledge strategies, featured by more innovative firms, cause higher financial performance. In a similar way, Other paper proposed two orientations: conservative vs. aggressive. Concern for exploration is more frequent in the latter (Zack, M. H, 1999).

In the codification strategy knowledge is extracted from the person who developed it, made independent of that person, and reused for various purposes, while the personalization
strategy focuses on dialogue between individuals (Table 2).

Table 2
Codification and personalization KM strategies (Carolina López–Nicolás, 2011)

<table>
<thead>
<tr>
<th>Economic motivation</th>
<th>Knowledge managed Focus</th>
<th>Knowledge reuse</th>
<th>New solutions and knowledge development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explicit Person-to- documents</td>
<td>Tacit Person-to-person</td>
<td></td>
</tr>
<tr>
<td>Use of IT</td>
<td>Heavy IT investment: connecting people and reusable knowledge</td>
<td>Moderate IT investment: facilitating dialogue and tacit knowledge sharing</td>
<td></td>
</tr>
<tr>
<td>Main tools</td>
<td>Decision support systems, Document repositories, Knowledge maps, Workflow, Best practices databases</td>
<td>Mentoring Groups, Videoconferencing, Bellow pages E-mail, Discussion forum</td>
<td></td>
</tr>
<tr>
<td>Human resource Management</td>
<td>E-learning, Rewarding the use of and contribution to databases</td>
<td>Mentoring, Rewarding knowledge sharing with others</td>
<td></td>
</tr>
<tr>
<td>Advantages</td>
<td>Economies of scale, Time savings, No need of reinventing the wheel</td>
<td>Knowledge cataloguing is easy, Flexible and adaptable knowledge, Improvements in task quality</td>
<td></td>
</tr>
<tr>
<td>disadvantages</td>
<td>Quicker and wider access and distribution of knowledge</td>
<td>Improvements in task quality, Improvements in clients image, Management of uncodificable knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High cost, Codified knowledge loses richness</td>
<td>Unwillingness to share, Inappropriate culture</td>
<td></td>
</tr>
</tbody>
</table>

This research focuses on the KM strategies typology (Hansen, M.T., 1999), because, first, their work is well-known and accepted in the field of KM, and has been used for other studies (464 times cited by November 2010, according to ISI Web of Science by Thomson Corporation). Second, it includes previous significant classifications and relates to the distinction between tacit and explicit knowledge (Davenport, T.H, 2001). Third, the concepts of personalization and codification of knowledge are easily understood by academics and practitioners. Nevertheless, this classification has also been criticized due to its incompatibility of combining codification and personalization (stuck in the middle), stating that companies who try to excel at both strategies risk failing at both. The stuck in the middle situation is an example of the focused perspective in KM strategy.

The Analytic Hierarchy Process

First proposed by T.L. Saaty in the 1970s, AHP is undoubtedly one of the best
available decision methods. AHP mathematically transforms conceptually subjective or fuzzy factors into quantitative variables to evaluate alternatives (Saaty TL, 1980). We use AHP to quantify the qualitative strategic factors considered in this paper and thereby evaluate the performances of the four KM alternatives. Fig. 2 illustrates the process used to conduct an AHP evaluation.

**Figure 2. The AHP decision tree**

First, we construct the hierarchical structure by which the causalities between the factors, sub factors, and alternatives are established. Second, we calculate the priority weights among the factors through the pair wise comparison matrix. Third, we calculate the total value for each payment alternative based on the priority weights multiplying the data from the expert poll.

**Pair Wise Comparison Matrix**

Because there are three factors and five technological, four economic, and four organizational sub factors, a total of $25 = c_1^2 + c_2^2 + c_3^2 + c_4^2 + c_5^2$ pair wise comparisons are created to make four matrix sets. Suppose $A_1, A_2, ..., A_4$ be the technological sub factors and their corresponding values the pair wise comparison matrix A is then made of the corresponding values and their reciprocal values. The matrix A is expressed as Eq. (f1)
**CONSISTENCY INDEX (CI)**

The law of transitivity is assumed in a perfect pair wise comparison matrix. If this assumption does not hold, inconsistency occurs between the pair wise values assigned by interviewees and the values obtained based on the law of transitivity. When the law of transitivity holds, the maximum eigenvalue of the matrix $\lambda_{\text{max}}$ is equal to $n$.

Unfortunately, the estimate of $\lambda_{\text{max}}$ is not equal to $n$ in most cases. Therefore, we calculate the CI to determine whether or not the law of transitivity is violated. The formula of the CI is

$$CI = \frac{\lambda_{\text{max}} - n}{n-1}$$

Where $\lambda_{\text{max}}$ is the maximum eigenvalue of the matrix $A$.

When $CI = 0$, the matrix is entirely consistent, whereas if $CI > 0$ the matrix is inconsistent. Saaty suggests a range of consistency (i.e., CI < 0.1) to avoid Type II error (i.e., the alternative hypothesis is rejected while it is true) (Saaty, 1980). It is said that the empirical test fails when CI exceeds 0.1 rather than 0. Our study passes the consistency test since its calculated CI is 0.087.

### The Priority Weights Within the Hierarchy

The priority weights between the factors (and sub factors) are obtained by calculating the eigenvectors in the pair wise comparison matrix sets. The pair wise comparison matrix $A$ multiplied by the priority weight vector $W$ is equal to $n$ $W$.

$$A.W = n.W$$

Thus

$$\text{(A-n).W} = 0$$

Where $W$ is the eigenvector of matrix $A$: Table 3 shows the priority weights of the **strategic KM factors in BPM** (and sub factors) obtained using the pair wise comparison matrix sets.
Data Collection

An “expert poll” is considered as the best source for the sample data used in AHP, because AHP is primarily a method of decision-making in organizations (Fichtner F, 1986). As a great number of staff still lack experience in using KM systems, we employed the expert poll to avoid sampling errors (i.e., too many missing values during the survey due to unknown answers). We therefore conducted a survey of Internet businessmen and experts in Iran regarding their assessment of the four KM alternatives. It is noticeable that the technological experts comprise more than half of the sample. This sampling may lead to overweighing of the technological factor. However, this bias seems inevitable at this stage of the research since few business and social researchers specialize in KM topics. In the survey, we asked the interviewees to measure the degree to which each payment system corresponds to the sub factors on a five-level ordinal scale (i.e., “extremely accurate,” “very accurate,” “accurate,” “less accurate,” and “much less accurate”). The total value for each KM alternative is then derived by multiplying the data collected from the expert poll by the associated priority weights of all the sub factors. Four ways are commonly used to impute quantitative values to ordinal data in AHP:

1. K-value assignment;
2. The 9/(10_K) method;
3. The (9 + K)/(11_K) method; and
4. The $9^{7/9}$ exponential method.

In the first three cases, K = 1, 3, 5, 7, 9 on the five-level ordinal scale. In the last case, K=0, 1, 3, 6, 9 on the five level ordinal scale. We found the test results to be consistent across the four methods, and we therefore assert the robustness of the results. This paper reports the results obtained using the K-value assignment method.

Result

Table 3 lists the priority weights among the factors/sub factors and their ranking, while Table 4 compares the values of the four payment systems.

Table 3
Priority weights in the AHP decision tree

<table>
<thead>
<tr>
<th>Factors</th>
<th>Percentage weight between the factors</th>
<th>Percentage weight within the factors</th>
<th>Ranking</th>
<th>Percentage weight among the sub factors</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological</td>
<td>,1,4‘A</td>
<td>,9,8</td>
<td></td>
<td>,1,944</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>,9,8</td>
<td>,8,1</td>
<td>1</td>
<td>,1,944</td>
<td>1</td>
</tr>
<tr>
<td>Reliability</td>
<td>,9,9</td>
<td>,9,9</td>
<td>2</td>
<td>,1,944</td>
<td>2</td>
</tr>
</tbody>
</table>
Dominance of the Technological Factor

Column 2 of Table 3 shows that the technological factors, which have an overall weight of 48%, play a predominant role in experts’ choice of KM strategies. The economic factors account for only 28% and the organizational factors for 24%. Columns 3 and 4 show the percentage weights and rankings of the sub factors within each factor. Column 5 records the relative weights of the 13 sub factors across all the factors. Among the sub factors, security is the primary concern (13.44 percentage weights), followed by links created completeness (each 9.60%), Convert ability (8.96%), and Information quality (8.64%).

The results in Table 3 corroborate that technological factors more forcefully determine the performance of KM strategies than economic or organizational factors. The organizational sub factors denoted Awareness, Outcomes, Avoid redundancy, and Innovation appear near the bottom of the list. Even though this finding may be biased by our samples, as previously mentioned, it still sheds some insights into how a KM strategy could be constituted to succeed. It is imperative to notice that the Convert ability is the only non technological sub factor among the top five. With its enormous Convert ability, the A1
outweighed other strategies to become the default KM system scheme in BPM. It is also noteworthy that maintain cost of KM strategy turns out to be the least desirable of all the factors. Even though this factor is critical to BPM, it appears to be a minor consideration when compared to other sub factors. This outcome helps to explain why forms of KM that emphasize maintain cost and awareness failed. Unlike user’s habits in using real currency, their choice of KM strategy is dominantly affected by usability and security concerns. Therefore, when adopting KM strategy users place a lower priority on Awareness and maintain cost, which are exactly the features of real currency.

Table 4 lists the scores for the four KM strategies alternatives. The scores are obtained by multiplying the K-values assigned to the ordinal data collected from the expert poll by the associated priority weights of the sub factors. The findings reported in Table 4 are robust because AHP analyses using different value assignment methods produce consistent results. Table 4 shows that the A1 scores 156.77 points in total, the A2 card 165.73 points, the A3 151.70 points, and the A4 146.17 points. We conclude that the A2 is a superior KM strategy, and the A4 is the least desirable vehicle. The A2 earns the gold medal because it performs functional and scientific in all aspects. In particular, the A2 functions best in the technological and organizational fields, scoring 84.13 and 42.89 points, respectively. In contrast, the A4 performs worst in the social field, gaining a organizational score of only 28.03 because it is the most deficient in convenience and merchant acceptance. Although the A2 has the second largest KM strategy (i.e., 17.20 points) after the A1, the low levels of its other economic and organizational sub factors compromise its likelihood of being extensively accepted. As far as the A1 is concerned, it demonstrates economic superiority with the highest score of 52.83. Although the A1 is not technologically capable, as evidenced by it gaining the lowest technological score (68.89), its economic merits overcome its technological deficiencies, helping it to take over the A3 and the A4. For example, the A1 scores 21.50 points for the convert ability criterion, far above the scores of the other systems, which raises it above the A3 and the A4 to become the second best choice overall. Undoubtedly, the installed convert ability predominantly affects user’s decision to use the A1. Table 4 shows that the A3 has the weakest performance in the economic field (37.96 points). High installation costs and a not-yet-formed customer base greatly diminish its desirability as KM strategy. However, the superiority of the A3 over the A4 in both the technological and organizational fields earns it the third best spot.

Table 4

Comparison of the KM strategies alternatives

<table>
<thead>
<tr>
<th>Factors</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological</td>
<td>68.890 (4)</td>
<td>84.134 (1)</td>
<td>77.683 (2)</td>
<td>77.146 (3)</td>
</tr>
<tr>
<td>Security</td>
<td>16.934 (4)</td>
<td>22.310 (2)</td>
<td>20.966 (3)</td>
<td>22.848 (1)</td>
</tr>
</tbody>
</table>
In this paper, we propose that the success of a KM strategy depends on technological, economic, and organizational factors. An AHP analysis was used to evaluate the performance of four KM strategy. The results of this analysis yielded several insights that confirm previous findings and shed light on the future of KM implementation. First of all, our study corroborates that technological factors dominate over economic and organizational considerations in experts’ adoption of KM strategies. Secondly, among the economic and social sub factors, the Convert ability by and large determines the comparative advantages of KM strategy. Finally, the A2 is found to be the superior KM strategy choice among the four solutions, because it has the best technological and organizational performances. In addition, the A3 could be a likely choice providing that its Convert ability can be formed.

It is imperative to note that the present results cannot be perfectly applied to the business process environment. In our expert poll, we did not distinguish the business environment from the other so that the results are somewhat limited to the latter case. Even though we find that the A4 is the least favorable choice among the four methods considered, we predict that its capability will be much deployed over IT services. Due to different protocols of transmission, the business environment, unlike the other, is asserted to be a closed environment. The benefit for users in adopting the A4 is that there would be no extra implementation costs if it were to become the de facto KM system over the

<table>
<thead>
<tr>
<th>Factors</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>15.360 (4)</td>
<td>16.896 (2)</td>
<td>15.936 (3)</td>
<td>17.856 (1)</td>
</tr>
<tr>
<td>Information quality</td>
<td>11.923 (1)</td>
<td>10.368 (4)</td>
<td>10.541 (3)</td>
<td>10.714 (2)</td>
</tr>
<tr>
<td>Information currency</td>
<td>8.736 (3)</td>
<td>14.784 (1)</td>
<td>12.768 (2)</td>
<td>8.064 (4)</td>
</tr>
<tr>
<td>links created</td>
<td>15.936 (4)</td>
<td>19.776 (1)</td>
<td>17.472 (3)</td>
<td>17.664 (2)</td>
</tr>
<tr>
<td>Economic</td>
<td>52.825 (1)</td>
<td>38.707 (3)</td>
<td>37.957 (4)</td>
<td>40.992 (2)</td>
</tr>
<tr>
<td>Cost recovery</td>
<td>9.380 (3)</td>
<td>10.500 (2)</td>
<td>7.420 (4)</td>
<td>11.480 (1)</td>
</tr>
<tr>
<td>Cost justification</td>
<td>16.027 (1)</td>
<td>8.316 (3)</td>
<td>13.154 (2)</td>
<td>7.560 (4)</td>
</tr>
<tr>
<td>Convert ability</td>
<td>21.504 (1)</td>
<td>13.261 (3)</td>
<td>10.214 (4)</td>
<td>17.203 (2)</td>
</tr>
<tr>
<td>Maintain Cost</td>
<td>5.914 (3)</td>
<td>6.630 (2)</td>
<td>7.168 (1)</td>
<td>4.749 (4)</td>
</tr>
<tr>
<td>Organizational</td>
<td>35.059 (3)</td>
<td>42.893 (1)</td>
<td>36.062 (2)</td>
<td>28.032 (4)</td>
</tr>
<tr>
<td>Awareness</td>
<td>5.299 (3)</td>
<td>11.702 (1)</td>
<td>9.053 (2)</td>
<td>5.299 (3)</td>
</tr>
<tr>
<td>Outcomes</td>
<td>7.445 (4)</td>
<td>15.048 (1)</td>
<td>10.613 (2)</td>
<td>8.554 (3)</td>
</tr>
<tr>
<td>Avoid redundancy</td>
<td>10.282 (1)</td>
<td>7.862 (3)</td>
<td>8.669 (2)</td>
<td>6.451 (4)</td>
</tr>
<tr>
<td>Innovation</td>
<td>12.034 (1)</td>
<td>8.280 (2)</td>
<td>7.728 (3)</td>
<td>7.728 (3)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>156.774 (2)</td>
<td>165.734 (1)</td>
<td>151.702 (3)</td>
<td>146.170 (4)</td>
</tr>
</tbody>
</table>

**Prospects for KM in BPM: Conclusion**

In this paper, we propose that the success of a KM strategy depends on technological, economic, and organizational factors. An AHP analysis was used to evaluate the performance of four KM strategy. The results of this analysis yielded several insights that confirm previous findings and shed light on the future of KM implementation. First of all, our study corroborates that technological factors dominate over economic and organizational considerations in experts’ adoption of KM strategies. Secondly, among the economic and social sub factors, the Convert ability by and large determines the comparative advantages of KM strategy. Finally, the A2 is found to be the superior KM strategy choice among the four solutions, because it has the best technological and organizational performances. In addition, the A3 could be a likely choice providing that its Convert ability can be formed.

It is imperative to note that the present results cannot be perfectly applied to the business process environment. In our expert poll, we did not distinguish the business environment from the other so that the results are somewhat limited to the latter case. Even though we find that the A4 is the least favorable choice among the four methods considered, we predict that its capability will be much deployed over IT services. Due to different protocols of transmission, the business environment, unlike the other, is asserted to be a closed environment. The benefit for users in adopting the A4 is that there would be no extra implementation costs if it were to become the de facto KM system over the
business environment. The A4 should become a far more popular KM system providing business develops to a large extent.

References


A. Berztiss and SYSLAB, Knowledge and workflow systems, in: Proceedings of the


