A Framework for Developing and Aligning a Knowledge Management Strategy

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Abstract. Businesses today, including non-profits, recognise the need for knowledge management (KM). KM may require new strategies and goals before it can be implemented, or it can be aligned with current business strategies for quicker implementation. The framework presented here is for managers in companies and organisations to use to align their KM strategies with business strategies to improve performance involving financial growth, cost reduction and customer satisfaction. A study of three strategic types of organisations (defender, prospector, analyser) and interviews at a large corporation and a non-profit organisation suggests that the conceptual framework presented in this paper can be verified. More empirical evidence of alignment is planned, as organisations become more sophisticated users of KM.

The authors have been working for over three years on the taxonomy and conceptual framework for KM/BS Alignment (also known as KMSABS) and present a procedure for implementation in this paper. The KM/BS Alignment model involves concepts, actors, actions and processes. An important aspect of the methodology is for businesses and organisations to identify their strategic character to support appropriate interactions associated with knowledge. As shown in this paper, product and knowledge managers can affect goal alignment and interaction in an organisation if they implement change based on the suggested framework.

Keywords: Alignment; collaboration; conceptual framework; knowledge management; performance; strategy; taxonomy.

1. Introduction

In the 1990s, the structure of the global economy passed from a strategy based on products to a business strategy based on knowledge (Nonaka, 1994). Among the intangible resources of an organisation, knowledge can be used to develop and to support productivity. In a business environment where mergers and global partnerships are increasing, many large organisations recognise the strategic importance of the ability to exploit inherited knowledge (Dieng et al., 2000). There are enormous requirements on an organisation to reconsider, to adapt and to respond to such pressures (Grant, 1996). Knowledge management (KM) has become a business science aimed at reorganising a firm around immaterial richness (Alavi and Leidner, 1999; Barney, 1991; Nonaka, 1998) and applying a process to capture, divide and re-use knowledge (Daveport, 1998). The development and use of organisational knowledge require a methodology suitable for setting up KM systems (Abou-Zeid, 2003; Asok Derek et al., 2003; Sharkie, 2003; Roth, 2003).

For over 20 years, researchers have emphasised the value of knowledge for increasing competitive advantage (Wernerfelt, 1984; Grant, 1991; Barney, 1991; Amit and Schoemaker, 1993; Asok Derek et al., 2003). However, some suggest that it is not easy to undertake a study of the strategic alignment of KM (Asok Derek et al., 2003, pp. 40–41). Others offer theoretical research to support the alignment of KM with business strategies (Booto Ekionea and Swain, 2008). Nevertheless, both the research literature and management practices suggest that it is important to align strategies for information systems with existing business strategies (Abou-Zeid, 2003; Asok Derek et al., 2003). A lack of alignment can impact organisational performance and result in the misuse of resources (Luftman, 2004).

This paper offers a method to identify, define and connect the key concepts in KM to business as the first step towards alignment. The process involves interlinking concepts, actors, actions and processes and is called KM/BS Alignment. Evidence from a study of organisations and interviews is presented to show that the KM/BS Alignment method can be applied.
2. Definition of Strategy Types

As illustrated simply in Fig. 1 (adapted from Miles and Snow, 1978), the KM/BS Alignment model aims to impact performance.

The alignment is based on a definition of business performance and types of business strategies that strategically align with KM in terms of both business goals and operational performance. Before launching a KM process, an organisation should define the type of business performance that it wants a knowledge management system (KMS) to improve. The organisation can review its short-, average- and long-term objectives. How are these objectives also defined according to the type of business strategy that the company has adopted? (The KM/BS Alignment model recommended has three types discussed below: defender, prospector or analyzer.) Certain business performance goals of a company can be reached by using KM, but different factors must be considered. Moreover, the organisation may determine that it wants to reach just one particular factor, a precise set of certain factors, or all of the value factors.

2.1. Business factors

In the KM/BS Alignment model, there are three groups of business value factors that support the use of KM. The three groups are based on objectives or goals:

1. Financial growth from knowledge capitalization.
2. Cost reduction from a KMS service or product.
3. Customer satisfaction improvement from the capture and storage of knowledge.

Knowledge capitalization by a firm involves the capture and dissemination of knowledge related to research and development, lab experiments, or new ideas. The development of KMS technologies and collection of specific knowledge are a resource and can become a commercial product themselves. Cost reduction can occur after a KMS is implemented and new services or products lead to innovation or facilitate knowledge-sharing and communication among stakeholders, such as developers, marketing, suppliers, retailers, employees and customers.

The implementation of a KMS can lead to increased customer knowledge, improvements in customer services and stronger customer loyalty if the systems treat information and make knowledge available throughout the organisation (Cooper et al., 2000).

2.2. Types of business strategies: defender, prospector and analyzer

The first step for alignment is to match types of strategies, starting with organizational business strategies. The classical strategy types in business are (Miles and Snow, 1978):

1. Defender (D).
2. Analyser (A).
3. Prospector (P).

In the context of alignment with KM (Booto and Swain, 2008), the three business types can be defined in terms of roles played by strategists with different personalities. The defender seldom carries out major adjustments in a business structure or technology and does not tend to work apart from his field of competence. The prospector looks for new products or market opportunities and prefers doing research without interruption. The analyser combines characteristics from the other two by minimising risk but maximising opportunities for growth and change at the same time.

These three approaches to business strategy reflect an organisation’s different views of different processes. One company or group can use all three approaches for different business concerns. If an organisation wants to launch a KM process, it must determine specific business performance objectives that it wants to improve using a Knowledge Management System (KMS). Table 1 matches the business strategy from Miles and Snow (1978) with the appropriate KM strategy to improve organisational performance. The types of KM strategies are from Sabherwal and Chan (2001). The use of differentiation and integration to classify performance by an organisation is based on Lawrence and Lorsch (1967).
Table 1. Model of alignment of types of strategies.

<table>
<thead>
<tr>
<th>Business strategy</th>
<th>Process</th>
<th>KM strategy</th>
<th>Org performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defend</td>
<td>Control customers by improving business processes</td>
<td>Be efficient with KM</td>
<td>Differentiate: grow the market, decrease cost, satisfy customers</td>
</tr>
<tr>
<td>Prospect</td>
<td>Seek opportunities from innovation and investment in R&amp;D</td>
<td>Be flexible with knowledge resources</td>
<td>Integrate: Use new technology</td>
</tr>
<tr>
<td>Analyse</td>
<td>Reduce risk and increase growth</td>
<td>See KM resources as comprehensive</td>
<td>Combine strategies</td>
</tr>
</tbody>
</table>

2.3. Types of KM strategies: efficient, flexible and comprehensive

Aligning KM strategies to the three business strategy types is based on three concepts: efficiency, flexibility and comprehensibility. In comparison, Sabherwal and Chan (2001) suggest three assumptions related to the alignment between business strategies and information system (IS) strategies. They also suggest the perception of alignment as the fourth concept, but in the KM/BS Alignment model, we consider perception to be a factor of performance. The Sabherwal and Chan assumptions for IS that can be applied to KM are:

1. The strategic alignment of knowledge resources strategies with business strategies to improve efficiency is perceived in terms of business performance (defenders).
2. The alignment of knowledge resource strategies with business strategies to support flexibility is perceived in terms of business opportunities (prospectors).
3. The alignment of knowledge resource strategies with business strategies means looking at business performance through a comprehensive prism that supports both efficiency and flexibility in KM (analysers).

Defenders are the most stable among the three types of strategies. They plan strategy for high quality products (usually within a standard) or provide low cost services. By improving business processes they aim to control or influence customers. The appropriate KM strategy to align with their business direction is to be efficient, which translates into operations as differentiating your product by growing your market, decreasing cost, and improving customer satisfaction.

In contrast, the prospector is the change-maker in a specific market. While basing the business on innovation, the prospector strongly invests in research and development. To function in a broad and dynamic field, this type of strategist seeks flexibility concerning technology.

Because the analyst carries out a combination of strategies from the defender and the prospector, he or she has a comprehensive strategy. This type of strategist seeks to reduce risk to a minimum while simultaneously maximising opportunities for growth and change.

In defining empirical research into the application of this alignment model, three different product teams were chosen and interview data were analysed. The “Defender” team developed a strategy for an existing, traditional telephony product. The “Prospectors,” however, worked on a new product that would apply software solutions to wireless applications.

Lawrence and Lorsh (1967) found in their early research that an organisation with high integration and differentiation also had a high performance level. So for the improvement of organisational performance and measurement of a KMS, it seems important to align the business strategies with appropriate KMS strategies and operational tools.

3. Research Applied to Principle Constructs and Types of Strategy

Three assumptions about the possibility of improvement for an organisation were made before the research study and analysis. Based on our literature review, the assumptions are:

1. Knowledge is an effective resource when it includes tacit and explicit knowledge related to a product, a technology, or a service for the unspecified improvement of individual or collective competences (Nonaka, 1994).
2. A business or development process can be enriched when knowledge about laws or regulations, industry rules, procedures or work specifications, standards and methods are capitalised on.
3. The successful KMS facilitates or supports integration and differentiation, which improves process effectiveness.
Specifically, for process effectiveness an organisation must have a capacity for co-ordination and innovation. Integration refers to processes or business entities. Organisational entities can be differentiated according to specific factors.

3.1. Matrix-based qualitative analysis

The matrix in Table 2 is based on theory and historical research (Booto and Swain, 2008). It was used to analyse data from three organisations whose product plans and strategies represented Defender, Prospector, and Analyser types. The matrix presents the business strategy types in the context of KM strategies and organisational performance (OP). The Defender organisation was a business involved in traditional telecommunications products for phone companies. The Prospector organisation was a team assigned to deliver new, advanced technologies to support wireless and mobile networks. The Analyser organisation was a non-profit, grant-based team that had a strategic goal of delivering to traditional educators class materials using a new digital technology. The research methodology used was deductive and applied the matrix to data and interviews as a conceptual framework for collection and analysis (see details below). The matrix lists research links to previous studies, which provide the conceptual foundation for the KM/BS Alignment model.

Using the matrix, the Defender, Analyser and Prospector types were studied in terms of marketing issues and by using the six attributes of business strategies: defensiveness, risk aversion, aggressiveness, pro-activity, analysis, and the future. To determine the interactive attributes for KM strategies, four theoretical, ideal values of the six attributes of business strategy were applied to the strategy profiles of the KM defenders, analysers and prospectors. The four KM system attributes are: (1) supports operations, (2) focuses on the market, (3) supports inter-organisational knowledge and (4) provides assistance for decision-making.

### Table 2. Matrix for analysis of KM/BS alignment model.

<table>
<thead>
<tr>
<th>Type</th>
<th>Research links</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defender</td>
<td>Plans to control its customers by the improvement of their business processes (Miles and Snow, 1978)</td>
</tr>
<tr>
<td>Efficient</td>
<td>Efficiency in KM is perceived as part of business performance (Sabherwal and Chan, 2001)</td>
</tr>
<tr>
<td>Differentiated OP</td>
<td>Aims to increase returns, to reduce the costs and to increase the customer satisfaction (Miles and Snow, 1978; Lawrence and Lorsh, 1967)</td>
</tr>
<tr>
<td>Prospector</td>
<td>Seeks new opportunities without interruption (Miles and Snow, 1978)</td>
</tr>
<tr>
<td>Flexible</td>
<td>KM flexibility is applied in terms of business performance (Sabherwal and Chan, 2001)</td>
</tr>
<tr>
<td>Integrated OP</td>
<td>Aims at effectiveness in the output of resources, process enrichment and process effectiveness (Miles and Snow, 1978; Lawrence and Lorsh, 1967)</td>
</tr>
<tr>
<td>Analyser</td>
<td>Carries out a combination of strategies and seeks simultaneously to reduce to the minimum risk while maximising growth (Miles and Snow, 1978)</td>
</tr>
<tr>
<td>Efficient and flexible</td>
<td>(See KM strategies for defender and prospector.)</td>
</tr>
<tr>
<td>Combined OP</td>
<td>Is seen through the prism of the comprehensibility of their strategy on KM (Sabherwal and Chan, 2001)</td>
</tr>
</tbody>
</table>

3.2. Study of organisation with defender strategies

Historical data about KM were collected from a project at a large telecommunications company. Then interviews were conducted to ask about KM activities. The organisation’s business strategy fit the definition of “Defender” as the product set was stable at the time and the corporation’s goals were to develop high quality products according to existing standards for phone switches. For the specific project studied, changes in development and communication processes seemed to align as part of an effort to provide a new low cost service. Customer satisfaction was expected to increase with an expert system to support workers in the field. Our research analysis involved investigating whether or not knowledge was shared and managed in order to be more efficient with communications. According to the KM/BS Alignment model, the appropriate KM strategy to align with their business direction is to be efficient, which translates into operational activities aimed to differentiate your product by growing your market, decreasing costs and improving customer satisfaction.

The knowledge sharing activities by the Defender team began with preliminary discussion to define appropriate software architecture. Software designers and architects were flown to the product lab from sites across the US. The lab had been moved to its location so the team could focus on trying new business processes while defending a current product line. At the time in the 1990s, this approach was efficient because the technology for Internet
meetings was not widely available. Executives wanted to promote knowledge sharing and supported early meetings on design and development process.

In interviews and discussion with team members later, the researchers learned that lab developers insisted on knowledge sharing and even more efficiencies than the executives originally planned. For example, when the Project Plan was presented as a completed document, the developers protested. One developer explained: "This split the center." Some said, "This isn’t going to work. Later we started weekly team meetings to summarise status, design, and plans." Developers supported OP that would speed up development, which would reduce expenses, and they also wanted to satisfy the customers. To accomplish these strategic goals, they demanded knowledge sharing throughout the project and went directly to customer sites to train them with a prototype when they seemed unsure of the product plan. Their product was delivered successfully.

3.3. Study of organisation with prospector strategies

The second study was of a company that was only about a year old. Data about the business showed that their product was delivered successfully to its international customer. In comparison, however, noted, that the product was not delivered successfully to its international customer. In comparison, the Defender project there was an efficient flow of information, more back and forth between organisations, and the executive managers sent directions to an "open" development team. Unfortunately, a more closed and formal approach to KM was observed, whereas the KM/BS Alignment model would recommend flexibility in knowledge sharing.

But meetings were necessary although little flexibility in format was observed. As one design engineer noted in a communication log, "A daily 15-minute discussion is usually enough to stay synchronized," and on the same priority list with project management. Also, I learn [the] political situation and head off issues early before they become bigger problems." During interviews, team members noted a change in KM was expected from an authoritative approach dictating new processes to a more investigative approach collecting process data and deriving processes from observations and requirements. This would take time for the young company.

In terms of OP, management supported integrated activities related to saving time; for example, in order to take so many new employees over a steep learning curve and to begin development sooner, their training and orientation was reduced from six to four weeks. In order to complete testing faster, testers used machines at another lab after midnight when labs operating in other time zones did not have priority. Saving time was crucial strategically and gave knowledge managers more reasons to be flexible in their strategic support of fast, effective information sharing.

Although the new product did not succeed in a global market, the company did learn from the experience and develop new, effective processes. For example, an individual tester in the US facility needed to fill knowledge gaps when trying to schedule test labs. To reach all sites, including Italy and England, communication was done both by phone and email late at night. The tester was frustrated when "I requested a specific machine with 8 links, but I only got 4 links." To resolve such operational problems, an integrated approach to increase output was developed using new, richer processes. The test system administrator created a web page for presentations that would support communication among parties at all levels. In terms of KM, she used email exchanges to send team members and managers updates with a web link to the page. The prospector team also developed a form-based tool for sharing lab time and test machines. Thus, a problem led to a new process that was approved and accepted. So although the product was cancelled, the OP was improved with a more effective and richer process to be used with future products.

3.4. Study of organisation with analyser strategies

For the third study, a non-profit organisation developing an educational tool was researched, observed, and interviewed. The team matched the "Analyzer" strategy characterisation as they avoided risk by being funded with a grant, but they also sought to provide a new digital library that would be open and grow. The team included academic directors as well as non-profit foundation contractors working on product development. The project leader adhered to a comprehensive business strategy that seemed to be a combination of strategies used by Defenders and the Prospects. He tried to set risks at a minimum in order to meet grant deadlines while simultaneously maximising opportunities for growth and change. For example, as he described, the contractor “was not ready yet, so they started without them since they could not sit around and had to show something done [to the granting agency].
Later it was hard to catch up on the schedule when we had to redo and dovetail work."

Knowledge during the analyser project had to be managed similarly to business projects due to the grant monies, deadlines and constraints on resources and finances. Interestingly, the same academic team had worked on several grant projects. The team met weekly and was observed during research. Decision-making was not a turbulent group task. However, as the product developed, results from usability testing led to concerned communications and emotional knowledge sharing. Emails were exchanged and additional meetings were scheduled. Overall, the KM seemed organised and reflected a shared business plan indicating both efficiency and flexibility.

Their OP reflected both differentiation and integration. For example, when issues arose about the need to have the digital library “perpetualised,” as some on the team referred to it, they wanted to differentiate their product based on early work. However, they agreed to integrate with an external process (WorldCat) and pressured team members to revise earlier classifications. That is, the team united around a new, comprehensible goal to ensure the survival of their product.

3.5. Summary of research data and analysis

Using the matrix in Table 2 to analyse the data from the three organisations, the research shows that alignment can occur between business strategy and KM strategy. Moreover, as the Prospector case shows, the lack of alignment may impact a product plan. Table 3 summarises as a checklist the business strategy types and their KM strategies and OP results as found by the research study.

4. Applications

We offer some additional tools to help researchers and knowledge managers to apply the KM/BS Alignment model. Using a form of entity-relationship analysis developed by Henderson and Venkatraman (1993), Table 4 presents the relationships between principal objects in business and knowledge management. Such a table provides dimensions for the KM/BS Alignment model and can support procedural alignments of business and KM strategies based on the definitions from researchers (Booto Ekionea and Swain, 2008). For example, critical success factors (CSF) in a business are measured by performance. However, the CSFs also contribute to measurements of business performance overall. Similarly, with KM entities, the type of KM strategy can direct the performance measurement of a KMS.

For a comprehensive list of the objects and definitions used in Table 4, Booto Ekionea and Swain (2008) have developed a complete classification or taxonomy of keywords associated with KM and business strategic alignment. The research presented in this paper is based on tables, figures and concept classification and is intended to support understanding of KM and to promote the use of knowledge and strategy in businesses and in academic research.

A knowledge manager in business may need a procedure for aligning strategies. The relationships described in Table 2 can be part of a process. Our research study did not apply this procedure, but we offer it for future analysis and to promote understanding of the interactive nature of attributes associated with knowledge and building a KMS. The sequential steps are:

1. External environment defines business drivers.
2. Internal environment defines business drivers.

<table>
<thead>
<tr>
<th>Business strategies</th>
<th>Defender</th>
<th>Prospector</th>
<th>Analyser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower costs</td>
<td>Increase customer sat.</td>
<td>Early market share</td>
<td>Low risk (grant support)</td>
</tr>
<tr>
<td>Efficient throughout project</td>
<td>New technology</td>
<td>Newly designed offering expected to grow</td>
<td></td>
</tr>
<tr>
<td>KM strategies</td>
<td>Efficient</td>
<td>Not Flexible</td>
<td>Efficient</td>
</tr>
<tr>
<td>Operations</td>
<td>Differentiate product as cheaper and meeting customer expectations</td>
<td>Improved process Integrated solution</td>
<td>Differentiation in the beginning</td>
</tr>
<tr>
<td>Faster production</td>
<td>Note: failure to ship</td>
<td>Integration in the end</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Relationships between KMS and business performance objects.

<table>
<thead>
<tr>
<th>Source</th>
<th>Relationship →</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business strategies</td>
<td>Define</td>
<td>KM strategies</td>
</tr>
<tr>
<td>KM external environment</td>
<td>Defines</td>
<td>KM drivers</td>
</tr>
<tr>
<td>KM internal environment</td>
<td>Defines</td>
<td>KM drivers</td>
</tr>
<tr>
<td>External environment</td>
<td>Defines</td>
<td>Business drivers</td>
</tr>
<tr>
<td>Internal environment</td>
<td>Defines</td>
<td>Business drivers</td>
</tr>
<tr>
<td>KM drivers</td>
<td>Influence</td>
<td>KM strategies</td>
</tr>
<tr>
<td>Business drivers</td>
<td>Influence</td>
<td>Business strategies</td>
</tr>
<tr>
<td>Business strategies and KM strategies</td>
<td>Influence</td>
<td>Performance</td>
</tr>
<tr>
<td>KM strategies</td>
<td>Determine</td>
<td>Types of KM strategies</td>
</tr>
<tr>
<td>Business strategies</td>
<td>Determine</td>
<td>Types of business strategies</td>
</tr>
<tr>
<td>Types of KM strategies</td>
<td>Directs</td>
<td>Measurements and performance indicators of KMS</td>
</tr>
<tr>
<td>Types of business strategies</td>
<td>Directs</td>
<td>Measurements and indicators of businesses performance</td>
</tr>
<tr>
<td>Measurements and performance indicators of KMS</td>
<td>Measure</td>
<td>Critical success factors of KMS</td>
</tr>
<tr>
<td>Measurements and indicators of businesses performance</td>
<td>Measure</td>
<td>Critical success factors of businesses</td>
</tr>
<tr>
<td>Critical success factors of KMS</td>
<td>Contribute to</td>
<td>Performance</td>
</tr>
<tr>
<td>Critical success factors of businesses</td>
<td>Contribute</td>
<td>Performance</td>
</tr>
<tr>
<td>Types of KM strategies</td>
<td>Interact with</td>
<td>Types of business strategies</td>
</tr>
<tr>
<td>Types of business strategies</td>
<td>Interact with</td>
<td>Types of KM strategies</td>
</tr>
</tbody>
</table>

4. Business strategy attributes determine the types of strategies.
5. The types of business strategies direct measurements of performance key indicators.
7. CSF in business contributes to overall business performance.
10. External environment defines KM drivers.
11. Internal environment defines KM drivers.
12. KM drivers influence KM strategy attributes.
13. KM strategy attributes determine the types of strategies.
15. The types of KM strategies direct measurements of performance and key indicators.
16. Indicators of KM performance measure CSF for KM.
17. CSF for KM contributes to overall business performance.

See Appendix A for a graphical illustration of procedure for the KM/BS Alignment model (Booto Ekionea and Swain, 2008).

5. Conclusions

Using a theoretical approach to the development of a conceptual framework, this paper has presented the KM/BS Alignment model in the context of specific projects that have succeeded and failed to align their knowledge and business strategies. We do not suggest that final proof has been given with three case studies; however, we have found support and verification of the model. In addition, we suggest a procedure for implementation that would involve the concepts, actors, actions and processes. The first step for businesses and organisations is to identify their strategic character. Are they Defenders of an existing standard product, Prospectors in a new market or technology, or Analysers seeking new markets with only as much risk as an established product? Depending on their business type, their KM should support appropriately efficient or flexible interactions associated with knowledge sharing. Both product and knowledge managers can use a KM/BS...
Alignment model to promote strategic alignment, which may affect operations and meeting goals.

References
Appendix A

A Framework for Developing and Aligning a Knowledge Management Strategy
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Her areas of research are collaboration, knowledge management, health informatics, and digital libraries. She is currently involved in studies to define knowledge management for healthcare facilities and nursing education organizations. She has presented papers and workshops for the ICKM, ASIST, STC, and IEEE.

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Mr. Booto has professional and academic experiences in IS analysis and design, user needs analysis and modeling, software management, project management, knowledge management engineering, strategic aspects of IT/IS/KM. He has been an independent consultant for Celtel DR Congo.