

# The Business Case For Knowledge Management

Eugene F. Yelden, Synrad, Inc., James A. Albers, Pacific Lutheran University

<http://www.tlainc.com/articl69.htm>

*Journal of Knowledge Management Practice, August 2004*

---

## ABSTRACT:

Many companies are reluctant to undertake knowledge management initiatives because of the difficulty in establishing a sound business case. In an effort to help alleviate this problem, we have developed a framework and set of guidelines aimed at assisting knowledge champions in their efforts to successfully justify a knowledge management program. In order to make a successful justification, it is necessary to clearly identify all the options available with the associated risks involved with each choice. Clearly delineating the expected hard and soft benefits of each aspect of the initiative will greatly aid in effectively justifying its need. In addition to establishing a methodology for a business case, three approaches aimed at reducing the risk of a knowledge effort are presented.

---

## Introduction

Knowledge management has become an important area of focus for many organizations in order to be successful in today's business environment. There are many documented cases of successful KM efforts that have greatly aided firms in virtually every area of business. However, even with these documented achievements, many companies are still reluctant to undertake KM initiatives. There are undoubtedly many reasons for this; however, foremost amongst them is related to the difficulty in establishing a sound business case and justification for this type of an undertaking.

The difficulty in establishing a business case for knowledge management programs is really an issue of cause and effect, and often stems from the fact that, since knowledge is intangible, there is no direct link from a knowledge management process to a demonstrable business outcome. As a result there are a number of steps required to show a connection between the knowledge management benefits and business outcomes.

In an effort to help alleviate this problem, we have developed a framework and set of guidelines aimed at assisting knowledge champions in their efforts to successfully justify a knowledge management program. First, there needs to be a strategy assessment that includes the firm's business goals and objectives. This is followed by a knowledge assessment or audit. Then, the knowledge strategy needs to be aligned with the business strategy and goals to identify any gaps

that may exist. After that step, a series of opportunities for knowledge programs should become apparent. At this stage, there is now enough information to begin to construct the arguments for justification of the business case.

In order to make a successful justification, it is necessary to clearly identify all the options available with the associated risks involved with each choice. Furthermore, it is required to first identify and separate the benefits of a given initiative, then determine its value to the firm, before proceeding to infer an associated cost and expected return for undertaking the effort. Clearly delineating the expected hard and soft benefits of each aspect of the initiative will greatly aid in effectively justifying its need.

Finally, having established the above methodology, three approaches aimed at reducing the risk of a knowledge effort are presented. These include targeting the efforts at an appropriate program and need within the organization, using an options based approach to evaluating the investment/return requirements, and promoting the necessity of instituting second-generation KM initiatives to realize long term, overall success.

### **Importance of Knowledge Management Initiatives**

Without question, knowledge management, and the awareness of it, has become increasingly important in today's business environment. Over the last several years, we have witnessed the emergence of what has increasingly become a knowledge-driven economy and society. Knowledge assets have often become more important to companies than financial and physical assets and are often the only way for a company to distinguish itself from its competitors and gain a competitive advantage.

Evidence that the importance of KM is a significant issue may be found in many areas, and can easily be illustrated with some examples. For instance, in the area of continuity management, there is the looming issue of potential lost knowledge given the enormous number of baby boomers that will be changing jobs or retiring in the next few years. The typical productivity cost of an employee leaving is 85% of their base salary due to their replacement's mistakes, lost knowledge and lost skills ( Beazley et al, 2002).

Related to this is the concept of knowledge half-life, from which it is found that knowledge reaches obsolescence, on average, in 500 days, but can be much quicker in some areas. This lost knowledge obviously has a cost. It has been estimated that \$115 billion sits idle in lost knowledge affiliated with production technologies. An astounding example of this is the loss of the original computer source code, written in the 1950's, that spawned the Y2K software crisis, has cost businesses worldwide an estimated \$1 trillion (Petch, 1998).

If smaller companies think they are immune to these issues, they need to think again. Smaller companies, who often claim that they can't afford to undertake KM activities, are wrong on two counts. First, knowledge is just as important, if not more so, to a smaller company trying to compete in the rapidly changing global marketplace. These companies must capture, assimilate, and capitalize on every advantage they can find, including knowledge. Secondly, smaller firms have an advantage in that they often have a culture and organizational structure in place that is

much more conducive to implementing knowledge management efforts. Small companies have to frequently adapt and thrive in a 'wear many hats' type of environment, which is predicated more on social relationships, familiarity and trust between employees. Organizational factors for an effective knowledge management environment are discussed in more detail by Albers & Jerke, (2004).

The results of several surveys that probed the views of executive managers are intriguing. For instance, one survey found that 87% of European business directors believe they could enhance their company's competitiveness with improved KM and 76% believe that building and sharing knowledge is important for their company (Williams, 2003). Another study of 500 firms conducted by KPMG illustrated that 80 % of senior executives feel that KM is strategic to their organization and 78 % feel that they have missed business opportunities. The study estimated that, on average, 6 % of annual revenue has been forgone due to missed knowledge opportunities; that their average spending on knowledge programs is < 2 % of annual revenue; and over 64 % said that their ROI on their knowledge efforts was unknown (Kok, 2003).

In spite of these surveys cited above, examples abound of organizations implementing successful knowledge management initiatives (Davenport & Prusak, 1998, and Myers, 2001). Hoffmann-Roche, the Swiss pharmaceutical firm, has estimated that it saves over \$1 million per day due to its KM activities. Hewlett-Packard's knowledge efforts aimed at customer service have reduced average call times by two-thirds and the cost per call has fallen by 50 percent. Chevron Corporation estimates that it saved an initial \$150 million, plus at least another \$20 million annually by instituting a best practices program. Dow Chemical's efforts to capitalize on its intellectual property have saved it over \$40 million. Over a six-year period since its investment of \$72 million, Schlumberger Corp. has realized an ROI of 668% on its KM programs (Swanborg & Myers, 1997). Finally, Teltech, a firm that specializes in aiding companies to implement knowledge management programs, reports that its clients enjoy an average ROI of 12:1 for their efforts (Abramson, 1998).

Given that there is clear and documented success and interest in implementing knowledge programs, why is it then so hard to justify these initiatives?

### **Difficulty In KM Justification**

Clearly, there is abundant evidence and motivation to make the case that knowledge management efforts are simultaneously beneficial and crucial to virtually every organization and must be appropriately emphasized. That being the case, why is it seemingly so difficult to make the business case and develop adequate justification to garner the approval of senior management for many knowledge management initiatives? Although it may work in certain circumstances, for obvious reasons, the "build it and they will come" approach is hardly appropriate justification. Similarly, invoking the maxim that "it is easier to ask for forgiveness after the fact than to ask for permission before beginning" should also not be regarded as an appropriate methodology to begin a KM effort. In reality, an approach like that could end up costing the company dearly.

It should come as no surprise that organizations don't institute knowledge management programs because of the philosophical goal that learning and education are good for the company or

society. They adopt knowledge management strategy not to save the world, but to make money (Manville and Foote, 1996). Therefore, part of the difficulty in justifying these resource and time consuming efforts is that many KM efforts have been very costly and yet have not been very successful. According to Ann Hylton, knowledge initiatives have had a dismal failure rate of 85 %, most often due to improper approach and/or implementation (Hylton, 2003). Another detrimental factor that may contribute to this poor showing is the fact that only 20% of KM programs have some form of metric to determine how business performance is influenced (Shand, 1999). Obviously, statistics like these make senior management apprehensive to follow down a similar path. But, more to the point, why is it so hard to determine the value of knowledge efforts?

In spite of the fact that there has been extensive documented proof that the promotion of knowledge and a learning organization does indeed enhance a company's financial performance in terms of one or more measures of ROA (return on assets), ROE (return on equity), MVA (market value added) or Tobin's q, executives still are skeptical (Ellinger et. al., 2002). Tobin's q is the value added by management above the value of a firm's assets and the q-measure is the market value of assets divided by the replacement value of the assets. A value of  $q > 1$  means that assets can generate cash flows that exceed the liquidation value of the assets (Perfect & Wiles, 1994). Unfortunately, many senior executives feel that knowledge management is just another very expensive, and often unsuccessful, management fad, buzzword and program du jour touted much like JIT, TQM, or BPR have been in the past (Olson & Aase, 2002). Therefore, educating the principal stakeholders is a key first step in the justification process.

Fundamentally related to this is the fact that there is often a significant disconnection between senior management and the knowledge program. This stems from the fact that, although it is the senior executives that sign the requisitions and pay for the program initiatives, it is typically the line-workers who use and have a critical reliance on those initiatives (Abramson, 1998). A better link between these actions and processes needs to be established. Knowledge management must come from both the middle-up and the middle-down to be successful.

However, the principal stumbling block in the justification process is a question of cause and effect. Knowledge is intangible, and because of that fact, the return on knowledge management efforts is not directly coupled to business outcomes. Further exacerbating this shortcoming is the fact that traditional accounting mechanisms are based on a financial orientation that doesn't easily account for knowledge. This is because traditional measures of ROI are often measures of the past, or at best the present, and focus on things such as sales revenue, profit, etc. EVA (economic value added) and MVA (market value added) measures are also possible, but suffer from similar shortcomings as other financial gauges. Even efforts to measure innovation capital (social and human) such as Skandia's implementation of the Navigator still track changes to the past. Balanced scorecard approaches may be better, but still not ideal. Many of these approaches are appropriate after the knowledge management effort has been established and a benchmark created, but not as a means of justifying it from the outset. That being said, the benefits of some KM efforts are more direct and relatively easier to measure, for instance, patents, copyrights, trademarks, etc. Also, some knowledge management initiatives are essentially free to implement. Aspects such as ethodiversity, modest connectivity, and allowing

complex adaptive systems to emerge in an effort to encourage innovation to flourish, can be effectively free or low cost (McElroy, 2003).

It must be realized that knowledge management can only directly impact knowledge processing, which in turn can only impact business processing, which ultimately impacts business outcomes (McElroy, 2003). In other words, there is no direct link from knowledge management to business outcomes as they are at least three steps removed from one another. This is because knowledge management efforts focus on knowledge processing. Knowledge processing is a social process that aids in the creation and integration of knowledge. Business processing is solely concerned with handling the interactions of all stakeholders in the firm's value chain and network. Finally, business outcomes are the obvious results of business processing performance as measured by the common metrics such as quality, profitability, etc.

Even in spite of this indirect link, however, the ROI (return on investment) of knowledge management can manifest itself by improved efficiency, effectiveness and innovation (Tobin, 2004). This is closely related to the idea of asset value, benefits potential and cost effectiveness as developed by Skyrme (Skyrme, 2001). Essentially, these measures of knowledge management value can manifest themselves through many mediums, such as, enhanced effectiveness via better efficiency or best practices, or increased revenue generation from existing knowledge assets (IP licensing, trademarks, copyrights). A further example of the possible return generated by knowledge would be through increasing the value of existing products and services by embedding industry-specific knowledge in software for customers in order to differentiate and enhance a firm's competitive advantage. Enhanced knowledge could also create greater organizational adaptability arising from filtering, gathering, and interpreting competitive intelligence, or making more efficient use of knowledge assets through best practices, etc. Finally, knowledge management can result in reduced costs (money saved through internal sharing or common practices) and/or reduced cycle times by improved business practices.

### **Establishing a Framework**

Given the above-mentioned difficulty in making a connection between the value of the knowledge efforts and the bottom line business performance, is it still possible to develop a framework of sorts to help make the justification for implementing knowledge practices? Ideally, we would like to establish a prescription and series of steps, similar to Albers' framework for implementing knowledge management model (Albers, 2003), that would aid knowledge champions in making their case and justifying a knowledge management program. To that end, a summary of the currently proposed business case framework is outlined below and is as follows:

1. 1. Strategy assessment
2. 2. Knowledge audit
3. 3. Knowledge and business strategy alignment
4. 4. Opportunity identification
5. 5. Value, business benefits, and evaluation
6. 6. Risk reduction techniques

Each aspect of the above-delineated framework will be expounded upon in more depth below.

### **Strategy Assessment**

As with most efforts, the initial focus needs to be at the top and is directed at assessing the role of knowledge within the business. Every business is unique and therefore, the KM initiatives that each undertakes are also unique to it. Just because a certain methodology or approach worked well at one firm is no guarantee that it will perform equally well at another. The organization needs to determine the business strategy to address the question: Where is the organization going? The strategic assessment includes establishing/reviewing the vision and mission, analysis of the firm's competitive environment, analysis of internal strengths and weaknesses, and formulation of strategic actions. Once this has been clarified, it then needs to be determined how knowledge fits into this overall business strategy, objectives, and value proposition of the company. The value proposition considers how the company specifically creates value and offers unique goods and services to its customers. Knowledge management can play a pivotal role in both defining what direction to take and implementing strategic actions.

### **Knowledge Audit**

A knowledge audit identifies what knowledge exists in the organization and what knowledge is needed to move the organization in a strategic direction. There needs to be a reckoning and accounting of the current status of any knowledge practices already occurring and in existence within the firm. The audit identifies the expertise in the organization, where it can be found, and how this expertise is accessed. It identifies what knowledge is needed to make decisions and what knowledge assets are needed in the future. Sometimes, a full and comprehensive knowledge IT audit may not be practical. If this is the case, at least a basic knowledge overview needs to be performed to have an awareness of the current state of any KM initiatives that are in place.

### **Knowledge And Business Strategy Alignment**

The third step that needs to be undertaken is to align the firm's knowledge strategy with its business strategy. In other words, identify what a company must know to implement its business strategy by identifying both strategic and knowledge gaps (Zack, 1999). The strategic gap is the difference from "what the firm must do" to "what it can do". The knowledge gap is the difference from "what the firm must know" to "what the firm knows". The alignment of the knowledge and business strategy should identify what knowledge really matters and what are the knowledge leverage points in the firm's performance. It is important to realize that this is an iterative process that is constantly ongoing with continuous feedback through multiple knowledge life cycles (McElroy, 2003). The knowledge life cycle includes both knowledge production and knowledge integration supported by the knowledge-processing environment of the firm.

### **Opportunity Identification**

Having now clearly established the organization's strategy, current knowledge capability and any gaps that may exist between the business strategy and knowledge strategy, one is now in a position to identify potential opportunities for knowledge development. This is the stage at which the challenge is met by defining and assessing those knowledge areas that will have the most impact on the business' objectives, which in turn, are linked to the firm's well-defined competencies.

At this point it would also be prudent to be mindful of some lessons garnered from previous KM implementations. First, the age-old truisms that "you can't control what you can't measure" and "you get what you measure" most certainly hold true. While identifying opportunities for knowledge development it must always be remembered that some form of baseline, benchmark, and measurement system must also accompany each effort in order to be able to manage and judge its success. Also, the tendency to place too much emphasis on IT technology must be tempered. IT is only an enabler to the KM efforts and not the whole process. A large amount of KM can be done without incurring enormous IT expenses. The oft-quoted Pareto Principle provides a useful rule of thumb in that the budget for the KM initiative should have only about 20 % of its total devoted to IT/tools and 80 % reserved for organizational and human process factors.

### **Value, Business Benefits, And Evaluation**

Once one or more opportunities have been identified, the case in support of each needs to be established. As eluded to previously, there are effectively only three viable approaches that may be invoked to justify a new initiative (Oldham et al, 1997): economic (break-even, ROI, IRR, NPV), analytic (value analysis, risk assessment, portfolio analysis) and strategic (business objectives, competitive advantage). All three of these have obvious benefits linked to business processes. David Skyrme has suggested the utilization of a KM benefits tree to highlight the connections and relationships between asset value, benefits potential and cost effectiveness (Skyrme, 2001). A benefits tree is a tool that traces all of the branches of a given benefit from its origin to those outcomes that affect the firm's bottom line. As pointed out by Skyrme, the benefits tree can usually be constructed to have only a few main categories, often including: information and knowledge benefits, intermediate benefits, organizational benefits, and customer and stakeholder benefits. By using such a construct to identify the linkages between each category, some of the more abstract and intangible benefits of a knowledge management initiative can be more easily and visibly highlighted to crucial stakeholders to whom the justification process is being addressed.

Several additional factors should also be considered and taken into account in order to establish a convincing business argument in favor of undertaking any change in general, but specifically a new knowledge initiative (Keen, 1988). First, the risks involved in undertaking the effort must be highlighted. Obviously, the more innovative and radical the proposal is, the fewer the number of precedents that will exist from which to benchmark and compare it against. Also, it needs to be remembered that the greater the potential payoff, the greater the likely risk involved in the undertaking.

Next, narrow the proposal down to three or four plausible alternatives:

1. 1. Doing nothing (a real option) has consequences (lost opportunity).
2. 2. Ideal case in which everything works according to plan.
3. 3. One or two intermediate cases between the ideal and doing nothing.

It is then necessary to compare the value of the benefits of the proposal through a value-benefit analysis. This step is important since, until a value is established, any cost is disproportionate. Also, costs are typically quantitative, predictable, and realized immediately whereas benefits are typically qualitative, uncertain, and deferred until later. Therefore, the benefits need to be established separately from the costs. Once the benefit has been established, then ask: “What cost is acceptable for this benefit?” or, “What is the cost threshold required to attain this benefit?”

Another valuable technique is to separate and rank order the hard and soft benefits of the program. This is because people view these two categories in different lights and some executives may put more emphasis on one type over the other. The hard benefits of a KM initiative are fairly straightforward and directly related to financial performance such as reduced costs, ROI, IRR, profit, etc. However, the soft benefits may be somewhat more elusive to articulate.

Soft benefits may include, but are certainly not limited to, any of the following: enhanced synergies among departments or SBU’s, accelerated innovation, achieving higher customer added value, reduced exposure to risks, quality improvement, increased teamwork, increased speed and responsiveness, and better decision making by front-line workers. Other intangible benefits include: increased employee retention, employees better connected to the experts, increased problem solving by front-line workers, improved work routines, process improvement, and the organization being more aware, involved, and focused on its strategic endeavors.

Having now established a methodology to help identify the knowledge opportunities, their values and benefits, the last step in establishing a business case is to perform risk reduction techniques as discussed in the next section.

### **Risk Reduction Techniques**

Having developed a framework that may be followed in an effort to make the business case for a knowledge management initiative, it is worthwhile to enumerate some thoughts that may aid both in the justification cause, as well as the successful implementation of a KM program.

As stated above, in order to be successful, the knowledge strategy needs to be aligned with the business goals and objectives. That issue notwithstanding, it also needs to be ensured that the efforts undertaken target the investment and KM initiatives at the right problem/issue in order to realize a satisfactory ROI. There are three broad categories that all such efforts can be associated with (Swanborg Jr. & Myers, 1997). They are, in order of increasing dependency upon greater resources of time, money and infrastructure:

- • General or structured sharing. This is the knowledge required to perform and do business in a given industry or market.

- • Focused competence. This is the knowledge that keeps an organization in step with its peers/competitors. It is how a business achieves excellence in its work including the specific business processes or value added activities that they concentrate on.
- • Strategic competence. This is the knowledge that gives the organization its specific source of competitive advantage.

It is highly recommended that the knowledge program be initiated with one or two relatively straightforward and quick projects to instill confidence and demonstrate success. This can then be followed up with a more extensive portfolio of projects that would undoubtedly include some from within each of the areas delineated above. Furthermore, the pilot group for the first initiative should not be the best or worst performing group or department in the company. Also, it should not be immediately related to an organization's core competency due to the heightened expectations and pressures to succeed and the potentially disastrous outcomes should it encounter difficulty. Hence, the most prudent choice would be a small group that is likely to succeed and to show benefits on a rapid time scale. In other words, don't try to solve all of the company's problems at once and don't risk the attempt on one of the core competencies of the business in the unfortunate event that it does fail!

Another technique that may be very beneficial to making the business case for knowledge management is to employ the use of an options approach toward the investment. The options approach is a viable alternative to aid in mitigating the risk associated with a given undertaking. This approach can be extremely valuable under any of the following circumstances: when an investment decision can be deferred; in helping managers strike a balance between waiting to obtain valuable information and foregoing revenues or strategic benefits from an implemented project; for prototyping investments; for technology-as-product investments (KM to some extent since it can be technology intensive).

As pointed out by Dixit and Pindyck, the options methodology makes two important distinctions that can be extended to help justify a KM program (Dixit & Pindyck, 1995). First, it highlights the issue that the common NPV acceptance rule is easy, but it makes the false assumption that the investment is either reversible or that it cannot be delayed. Secondly, the role of risk and uncertainty can be clarified by recognizing that an investment opportunity is like a financial call option. In this light, variables that affect the project's (or option's) value can be used in the well-known Black-Scholes option-pricing model (Sender, 1994). Factors such as the initial capital investment, the present value of the expected cash flows from the project, the length of time of the option, the project volatility and an appropriate risk-free rate of interest can all be estimated and varied to aid in valuing the project. Furthermore, the options approach highlights the benefit that relatively small, initial investments are a way to establish the firm's 'right' and ability to 'leave the door open' to any given opportunity for which the ultimate payoff may not be immediately obvious or calculable. Viewing and couching KM initiatives in this type of a framework may be very beneficial to establishing adequate justification for the program to get approval from its stakeholders.

Finally, it is imperative that the knowledge efforts should not place too much emphasis purely on first-generation, supply-side KM, as it probably will not be conducive to realizing a good return.

Rather, the programs should emphasize demand-side forward investments that deal with the production of new knowledge rather than just the sharing of old. It is decidedly more fruitful to concentrate on capturing forward-looking, demand-side KM due to knowledge half-life and the overwhelming tendency for knowledge efforts to just try to codify tacit knowledge. In fact, second-generation KM is the best of all places to invest since it promotes a more holistic viewpoint of the entire process. To that end, it should be remembered that the primary motivation for knowledge management initiatives in the first place is to ensure that the right information gets to right people at the right time and to make sure that the right information exists and is created in the first place (McElroy, 2003).

Now, having followed the above guidelines and framework in an effort to establish a solid business case for any KM initiative, one could now proceed with a successful implementation of that program according to the framework developed by Albers (Albers, 2003).

## **Conclusion**

The justification and business case for undertaking a knowledge management initiative can often seem as difficult, or potentially even more onerous, than the execution of the KM program itself. Not surprisingly, this has either resulted in a completely aborted attempt to continue, or else prompted the “build it and they will come” attitude in place of a proper analysis. The primary reason for this difficulty is a lack of understanding of the relationship between the nature of KM and its inherently indirect impact on business processes and outcomes. However, by following the framework proposed herein, it is possible to first establish the benefits of the program, then determine a value to the organization of these benefits, and ultimately, associating this with a cost and/or expected return on the initiative.

Finally, three approaches that may be employed in an effort to minimize the risk involved in undertaking a knowledge management program and concurrently enhance the probability of a successful implementation were discussed. These three approaches were: to ensure that the initial KM effort is targeted at an appropriate area that will have a quick success and highlight the positive aspects of the program, that the use of an options based approach for determining investment decisions may be applicable to knowledge efforts as well, and that initiatives aimed at second-generation KM programs are more likely to prove beneficial in the long term. Following these guidelines and recommendations should result in the successful justification of the business case for a knowledge program as well as providing an organization with valuable insights into how to make their initiative a resounding success.

## **References**

Abramson, G. (1998). “Measuring Up”, *CIO Magazine*, 15 May.

Albers, J. A. (2003). “Framework for Implementing Knowledge Management”, *Portland International Conference on Management of Engineering & Technology*, Portland Oregon , July.

Albers, J. A. & Jerke D. L. (2004). "Organization Factors for an Effective Knowledge Management Environment", 25<sup>th</sup> *McMasters World Congress on Management of Intellectual Capital*, Hamilton Ontario, Canada, January 14-16.

Beazley, H., Boenisch, J. & Harden, D. G. (2002). *Continuity Management: Preserving Corporate Knowledge and Productivity when Employees Leave*, J. Wiley & Sons.

Davenport, T. H. & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press.

Dixit, A. K. & Pindyck, R. S. (1995). "The Options Approach to Capital Investment", *Harvard Business Review*, May/June, p. 105.

Ellinger, A. D., Ellinger A. E., Yang B. & Howton S. W. (2002). "The Relationship Between the Learning Organization Concept and Firms' Financial Performance: An Empirical Assessment", *Human Resource Development Quarterly*, Spring, p. 5.

Hylton, A. (2003). *Why the Knowledge Audit is in Danger*, white paper, Oct., available at <http://www.annHylton.com>.

Keen, P. G. W. (1988). "Making the Business Case for Change", *Competing in Time: Using Telecommunications for Competitive Advantage*, Ballinger Publishing Co., available at <http://peterkeen.com/pitof01.htm>.

Kok, G. (2003). *Insights from KPMG's European Knowledge Management Survey*, KPMG white paper, 2003, available at <http://www.kpmg.nl/kas>.

Manville, B. & Foote N. (1996). "Strategy as if Knowledge Mattered", *Fast Company*, April/May, p. 66.

McElroy, M. W. (2003). *The New Knowledge Management: Complexity, Learning, and Sustainable Innovation*, Butterworth-Heinemann Press.

Myers, P. S. (2001). *Making the Business Case for Knowledge Management*, ICEX International Capital Exchange white paper, available at <http://www.icex.com>.

Oldham, K., Kochhar A. K., Hather R. M. and Halton J. (1997). "Structured models to assist in justifying investment in knowledge-based systems", *Proceedings of the Institution of Mechanical Engineers*, Vol. 211, Part B, p. 579.

Olson, J.R. & G.R. Aase (2002), "Programs du jour: Why don't they work?", case BH076, *Business Horizons*, May-June, pp. 17-24.

Petch, G. (1998). "The Cost of Lost Knowledge", *Knowledge Management Magazine*, Oct.

- Perfect, S. & Wiles, K. (1994). "Alternative Constructions of Tobin's q: An empirical comparison", *Journal of Empirical Finance*, Vol 1, pp. 314-341.
- Sender, G.L. (1994). "Option Analysis at Merck", *Harvard Business Review*, Jan./Feb., p. 92.
- Shand, D. (1999). "Return on Knowledge", *Knowledge Management Magazine*, April.
- Skyrme, D. (2001). *Making the business case for knowledge management: As simple as ABC?*, I<sup>3</sup>Update/Entovation International News, July/Aug, No. 52, available at [http://www.skyrme.com/updates/u52\\_f1.htm](http://www.skyrme.com/updates/u52_f1.htm).
- Swanborg Jr., R. W. & Myers P. S. (1997). "Wise Investments", *CIO Magazine*, 15 Oct.
- Tobin, T. (2004). *The Insider's Guide to Knowledge Management ROI*, ServiceWare Technologies white paper, Feb., available at <http://www.serviceware.com>.
- Williams, A. (2003). "KM-project ROI should be visible to directors", *KM Review*, Jan/Feb, p. 8.
- Zack, M. H. (1999). "Developing a Knowledge Strategy", *California Management Review*, Spring, p. 125.

---

#### **Authors' Background And Contact Information:**

Dr. James A. Albers is a Faculty Fellow in Technology & Innovation Management in the School of Business at Pacific Lutheran University ([albersja@plu.edu](mailto:albersja@plu.edu)). He has led the formulation, development, and execution of the Technology & Innovation Management Program since 1995. His specialty areas in teaching and consulting include: knowledge management, strategic management of technology, information systems management and, innovation management. He can be contacted at Pacific Lutheran University, School of Business, Tacoma WA, 98447, Tel: 253.535.7301, Fax: 253.535.8718.

Dr. Eugene F. Yelden is Chief Scientist and Manager – Laser Technology at Synrad, Inc. His interests are in the areas of improved product development, innovation, and the commercialization of technology by enhancing group performance through strategic, innovation and knowledge management. He can be contacted at Synrad, Inc., 4600 Campus Place, Mukilteo, WA 98275, Tel: 425.349.3500, Fax: 425.349.3667, [geney@synrad.com](mailto:geney@synrad.com).

---