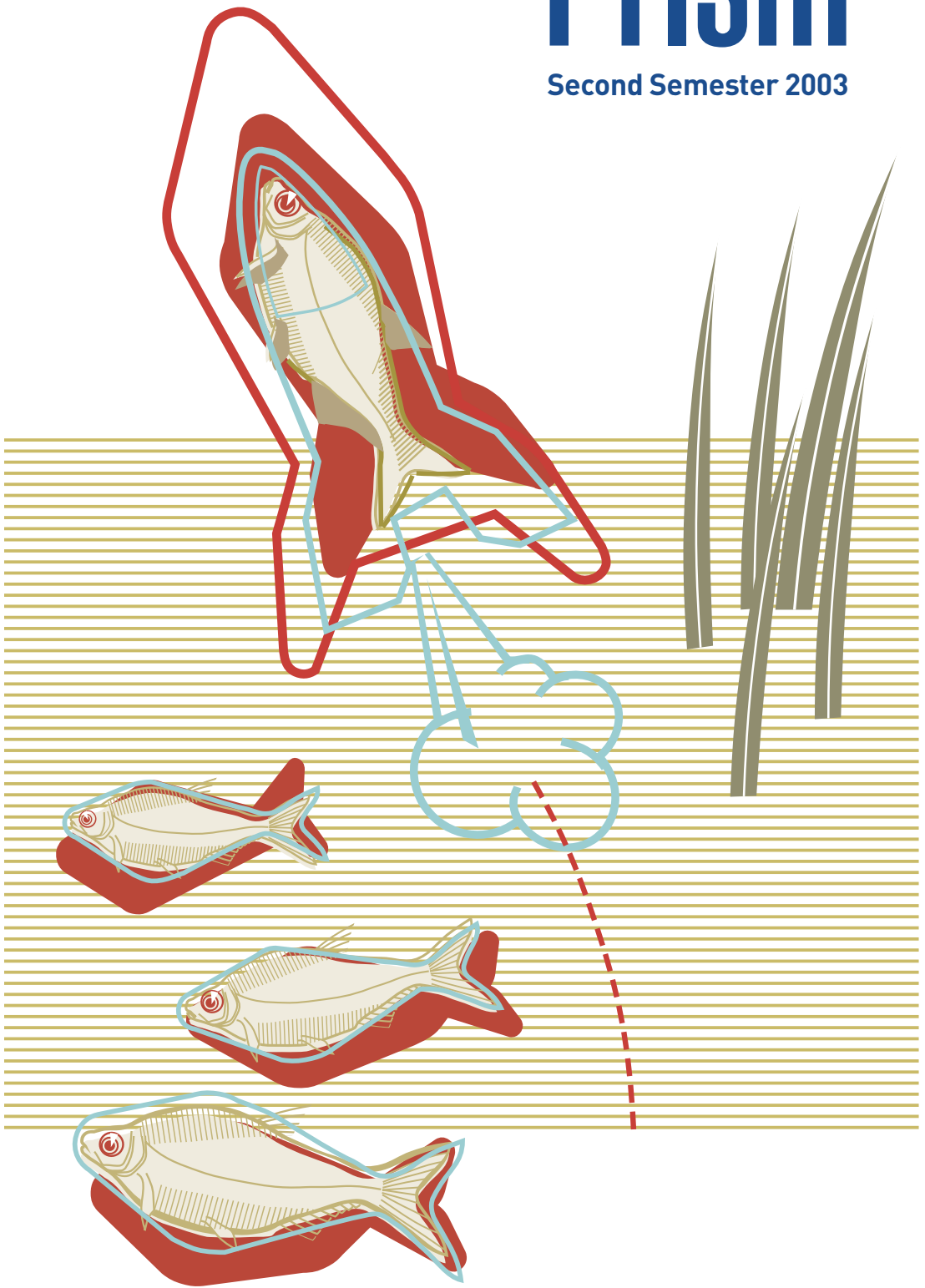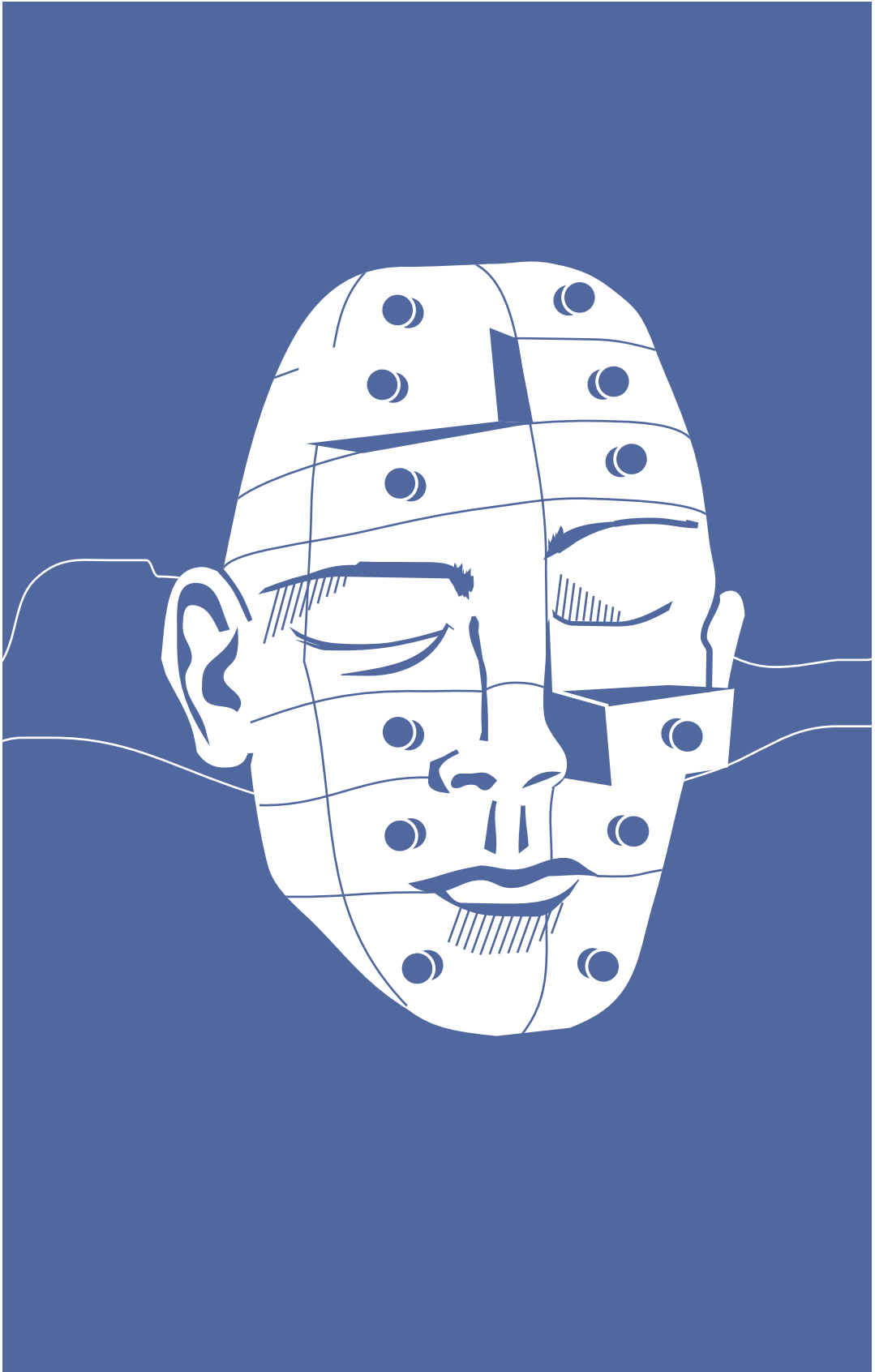# Prism

Arthur D Little

Innovation at Work

Knowledge Management –
Are you Inspiring Innovation?

Frank Kirschnick, Grant Gustafson, and Stefan Odenthal

Innovation, according to Thomas Edison, consists of one percent inspiration and 99 percent perspiration. Yet, while Innovation Management takes credit for numerous spectacular business results, Knowledge Management (KM) rarely does. Why is that? KM does not fall short on inspiration, judging from its coverage in the business media. Let alone on perspiration, as practical experience has shown. In this article Kirschnick, Gustafson and Odenthal discuss KM as an innovation in its own right that may considerably boost innovation.

Can a leading financial service group with offices around the world leverage its potential of innovation by establishing international knowledge networks of topic experts? Can a pharmaceutical company boost R&D effectiveness by qualified knowledge exchange between its worldwide research centers? Yes, as practice has proven. The causal link between KM and innovation is striking. KM serves as a major catalyst for innovation without re-invention.

First of all, KM triggers inspiration by cross-fertilizing ideas within research communities in-house and via trend-scouting, monitoring and exchange of ideas in external markets. In fact, external ideas acquired through purchase or lease account for much of the inspiration of the world's most innovative companies.

More fundamentally, KM reduces perspiration along the entire value chain of innovation management. A comprehensive KM concept targeting innovation enhances responsiveness to market opportunities, improves R&D investment decisions, and lowers the related R&D project cost and attrition rate, all through efficient and effective re-use of experience. KM also accelerates product development and prototyping through rapid knowledge exchange. The transfer of experience in patenting and licensing, in particular, reduces the risk of delays for legal product approval, plant start-up and market entry. Finally, KM supports better protection of innovation via faster response to patent violations.

Still skeptical? Then you are not alone ... apparent KM benefits and success stories rarely convince management to make a tangible investment into KM. Despite painful needs at working level, many companies are hesitant to tackle the opaque challenges of KM. One major reason is the intimidating attrition rate of KM projects, ranging around 50 percent and based upon wrong approaches. KM is an appealing but risky innovation that must be handled with care.

A Shopping List for Knowledge Markets

Beyond operative benefits, KM may yield major strategic advantages for a company. It may help to sustain or expand a company's knowledge portfolio and to reduce related business risks.

Like tangible resources, a company's know-how can typically be traded. Documented knowledge, in particular, can be bought and sold on the market, or exchanged with other companies. Yet, the largest part of a company's know-how is never documented – it is in the heads of its employees. This implicit knowledge is traded on the job market, together with its human owners. So there is the need to retain this knowledge before it walks out the door.

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What type of knowledge does the company need, and when? Can we plan ahead, and purchase or hire accordingly? Possibly at an operative level, but there are limits. September 11, or S.A.R.S. have once again shown the limitations of planning and forecasting. An organization needs to be flexible and agile enough to react and adapt rapidly to unexpected situations. It is not the knowledge about the future, but rather an ability to respond to future events through the availability of appropriate knowledge, that makes up the strategic value of KM. Knowledge about alternative distribution channels, about the capabilities of local subsidiaries or about product substitutes, for instance, helps companies in times of crisis, as this knowledge mitigates the sudden dips in supply or sales and minimizes the need for travel. Broad and diverse knowledge provides options that leaders can exercise, and thereby reduce business risk.

Knowledge Management in Daily Business – A Common Theme with Many Flavors

Defining Knowledge Management (KM) is not easy – it often proves to be a maligned term. When asking ten managers about KM, you will get more than ten different answers. One common denominator, however, proves to be a joint understanding of knowledge, as opposed to information or data. Knowledge enables effective action, such as launching an innovative product in a new market, or delivering a personalized customer service at peak demand time. In this regard, knowledge exceeds pure understanding of documented information, based on text and figures generally referred to as data.

KM comes in many flavors. Companies can manage the creation, efficient structuring, rapid distribution, long-term storage or effective use of knowledge, or all of the above. Clearly, the purpose of KM in a specific situation determines its full-fledged definition. Three examples from client cases:

Case 1: Automotive Industry
A large multi-national automotive manufacturer is challenged by the industry's shortening product innovation cycles. To facilitate shorter time-to-market of new models in its three leading product lines, the company develops and deploys a KM concept targeting knowledge creation in key areas of innovation. Establishing inter-departmental Communities of Practice (CoP) in its corporate R&D headquarter, the company is able to accelerate the renewal of specific and unique product knowledge. It thereby shortened the average lead times of product innovations by almost 20 percent.
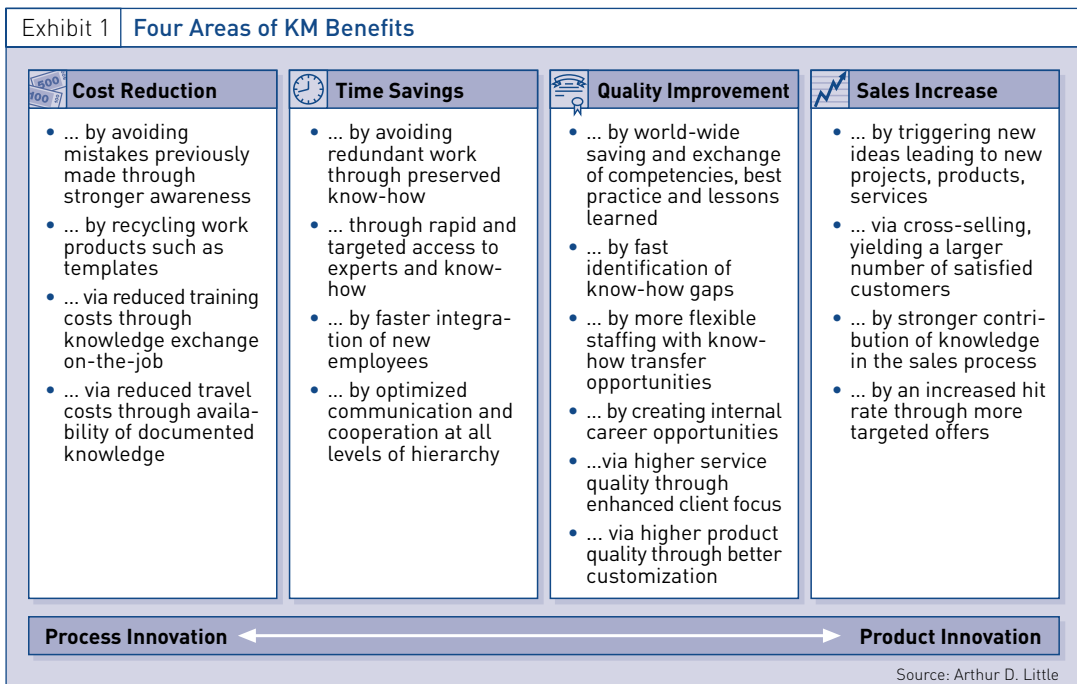
Case 2: Utilities
A major utility corporation running a significant number of power plants is challenged by cyclical and unexpected downtimes. To reduce downtime during inspections, overhauls and out-of-cycle technical repair, the company develops a KM concept. It is supposed to capture and distribute best practices and lessons learned during security checks and technical maintenance in all plants. An electronic library accessible via corporate intranet supports the effective search and use of the knowledge on-site, resulting in a reduction of the average plant downtime by ten percent.

Case 3: Medical Equipment
A producer of medical equipment for special care units in major clinics is challenged by an increasing turnover rate of its sales staff. To secure the quality of solutions offered, and to better target sales efforts, the company develops a KM concept to track client sales history, in particular the installed base of medical equipment of its major client accounts. This installed base covers own and competing products, alerting sales representatives when the end of a product life cycle is achieved and renewal should be offered to the client. Through continuous availability of sales history and cumulative market intelligence, the average success rate in three pilot countries increased by 15 percent.

Four Critical Success Factors

Tired of success stories? In their quest for KM benefits, companies are challenged to cope with four critical success factors jeopardizing their KM success. These success factors are in-line with four phases of a typical KM venture:

Exhibit 1 | **Four Areas of KM Benefits**

Cost Reduction	Time Savings	Quality Improvement	Sales Increase
• … by avoiding mistakes previously made through stronger awareness	• … by avoiding redundant work through preserved know-how	• … by world-wide saving and exchange of competencies, best practice and lessons learned	• … by triggering new ideas leading to new projects, products, services
• … by recycling work products such as templates	• … through rapid and targeted access to experts and know-how	• … by fast identification of know-how gaps	• … via cross-selling, yielding a larger number of satisfied customers
• …via reduced training costs through knowledge exchange on-the-job	• … by faster integration of new employees	• … by more flexible staffing with know-how transfer opportunities	• … by stronger contribution of knowledge in the sales process
• … via reduced travel costs through availability of documented knowledge	• … by optimized communication and cooperation at all levels of hierarchy	• … by creating internal career opportunities	• … by an increased hit rate through more targeted offers
		• …via higher service quality through enhanced client focus	
		• … via higher product quality through better customization	

Process Innovation ◄─────────────────────────► **Product Innovation**
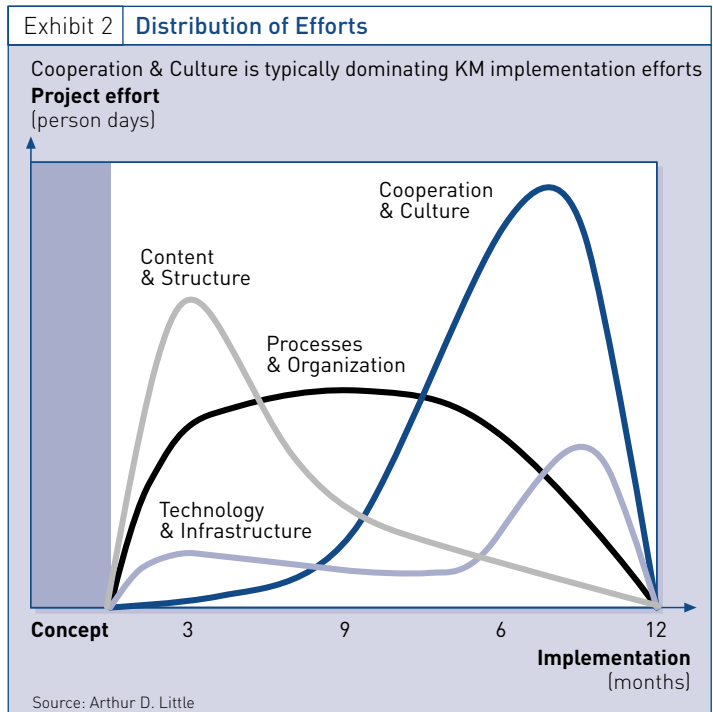
Source: Arthur D. Little

- Top management commitment is critical for the preparation phase.
- The right conceptual mix is crucial in the concept phase.
- Company-wide buy-in is essential in the implementation phase.
- Persistence is key to a successful KM operation phase.

1. Generating Commitment for Knowledge Management

The first critical KM success factor is a commitment for
KM by all stakeholders, but particularly by top manage-
ment. KM pioneers should start with a clear, transparent
and defensible line of reasoning why KM is important for
their company. This line of reasoning should be docu-
mented and communicated throughout the company. It is
an argument to justify KM investments. Yet, what differ-
entiates management commitment from mere attention
or interest is not the money that management commits
to the KM venture. Symbolic investments are all too often
an alibi paid to appease frustrated employees. Top man-
agement commitment is the apparent willingness to
make KM happen, to be demonstrated by a board member
as champion or driver of KM.

An appropriate line of reasoning to generate top manage-
ment commitment may include a multitude of plausible
arguments for KM. Such arguments are displayed in
exhibit 1, ranging from cost reduction to sales increase.
The question is, to what level can and should these argu-

Exhibit 2 | Distribution of Efforts

Cooperation & Culture is typically dominating KM implementation efforts

Project effort
(person days)

Cooperation
& Culture

Content
& Structure

Processes
& Organization

Technology
& Infrastructure

Concept   3   9   6   12

Implementation
(months)

Source: Arthur D. Little

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ments be analytically justified and quantified? For the largest part, quantitative expectations are subject to management styles, independent of the business model. Some managers expect to receive increased sales or cost reductions from KM, whereas others consider it merely as a catalyst for cultural change. We can observe a trend towards quantitative demands beyond purely qualitative expectations, although cultural considerations are officially positioned as ultimate reason for a corporate KM engagement within the company.

If KM is to become an integral part of a company's business model, it may not suffice to purely assess KM benefits, and to roughly sketch cost projections for a KM concept, implementation and operation. Instead it may be necessary...

- to calculate a KM business case prior to the KM project, considering a company's major KM benefits,
- to develop a KM concept considering knowledge valuation and prioritization at working level to realize the full KM potential, and to serve as a basis for an effective controlling,
- to control the impact of KM during operation in-line with the original business case, strengthening KM persistence and allowing adequate management response.

All three steps form a robust and pragmatic business approach to KM that can prove most useful in creating the basis for a KM commitment.

2. Working out the Right Conceptual Mix

The second critical success factor is an appropriate KM concept that actually meets the company's capabilities and needs. Many KM projects fail because the concepts are not geared towards the original business needs of the company. Inspiration from KM success stories published in the media is useful, but needs to be handled with care. Copying a KM concept successful elsewhere – even in the same industry – will not guarantee its success in your company.

Experience has shown that four working fields need to be considered when developing a KM concept: (1) content &

structure of the knowledge to be managed, (2) processes & organization of KM within the company, (3) cooperation & culture as a basis for KM, and (4) technology & infrastructure supporting KM. In this regard, KM differs from pure information or document management applications, which do not span the entire KM value chain.

One goal of a good KM concept is to find a magic mix of efforts in each of these fields. The balanced integration of all four working fields is critical for KM success. The predominant killer criterion for KM success in the long term is cooperation & culture (see exhibit 2). To avoid having to spend too much manpower on the topic, cultural issues should be tackled as early as possible.

Content & Structure

Companies tend to avoid a detailed categorization, valuation and prioritization of knowledge at working level. Fair valuation criteria are hard to define, and their use in practice is typically biased.

Companies tend to avoid a detailed categorization, valuation and prioritization of knowledge at working level. Fair valuation criteria are hard to define, and their use in practice is typically biased. To avoid a dispute concerning the question which of the originators of knowledge gets the credit, companies simply consider all internal knowledge of equal importance. Similarly, key words and other metadata are omitted. Thereby, KM fails to master the overflow of knowledge. The search for business-critical knowledge becomes time-consuming or even impossible, leading to frustration and rejection of KM at the working level.

Practical Example: A multinational producer of information and communication equipment runs a document management system (DMS) to allow company-wide search and access to stored market and technical knowledge. Yet, there is no clear directory structure, nor a policy on where documents are to be posted or what other types of metadata are to be provided. The impossibility of finding documents via a search based on hierarchy or key words turns the DMS into a knowledge drain, despite its technological sophistication.

Our recommendation: This company should first clearly define its truly relevant target knowledge areas with high business impact. Second, it should develop and communi-

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How to calculate a KM Business Case

Step 1 – List drivers and benefits: Determine cost and revenue drivers in the target business area and list potential KM benefits for each driver.

Step 2 – Map and quantify benefits: Assign benefits to the benefit levels of awareness, availability, or accessibility which offer different approaches to benefit quantification:

- Awareness is the value ($) of understanding that additional knowledge is required to master certain tasks, e.g. through a discussion with seasoned market experts.
  - What was the cost ($) of damage or missed opportunity in the past due to lack of awareness, e.g. failure of a product in the Japanese market due to lack of knowledge about consumer preferences?
  - What is the likelihood (%) of such an event repeating in the future?
  - Multiply both figures to receive your benefit of knowledge awareness.

- Availability is the value ($) of having your crucial knowledge captured in a structured, transferable form, e.g. through debriefing of experts by a knowledge manager.
  - What is the value ($) of not having to re-invent the wheel and instead being able to re-use a well-documented solution in the future, e.g. a complete set of documents for FDA approval to launch a drug in the U.S.?
  - What is the share (%) to which this solution can be transferred?
  - Multiply both figures to receive your benefit of knowledge availability.

- Accessibility is the value ($) of your ability to flexibly and efficiently search and download your documented knowledge, e.g. via key word search in a DMS.
  - What is the increase in efficiency of your work (%) by being able to search and download documented knowledge?
  - How many of your employees (#) will benefit?
  - What are their average HR costs ($)?
  - Multiply all three figures to receive your benefit of knowledge accessibility.

Step 3 – Estimate costs: Estimate the costs for a KM concept, its implementation and operation to realize the quantified benefits. Distinguish between personnel costs (internal and external), material costs (including hardware and software) and information costs.

Step 4 – Compute NPV and decide: Define your analysis horizon and discount rate, and compute the NPV of the KM venture considering annual cash flows for total benefits (step 2) and costs (step 3) for the time period considered. Consider the NPV in your decision whether or not to launch the KM venture.

cate a clear top-down structure for the DMS based on the target knowledge areas. Third, for every document migrated into this structure, a complete content and relevance description through metadata is necessary to ascertain that it can be found by an arbitrary user via key-word search.

Processes & Organization

KM concepts often neglect a clearly defined KM process landscape. KM processes to create, capture, codify, store, distribute and use knowledge tend to be sketchy. In many cases, KM lacks integration in the business process map. Sometimes KM processes are integrated, but as voluntary add-ons that are not supported by the line organization. Some other KM processes are out of touch with the realities and turn out to require significant resources or to be infeasible in practice.

KM concepts often neglect a clearly defined KM process landscape. KM processes to create, capture, codify, store, distribute and use knowledge tend to be sketchy. In many cases, KM lacks integration in the business process map.

Practical Example: A major national construction firm establishes a KM concept to capture and disseminate key experiences from its construction projects, including best practices and lessons learned. Project experiences are to be consistently captured through a debriefing process at the end of each project. Yet, to save working time and project budget, the debriefing process is often delegated to junior workers lacking experience, or the process is skipped altogether. As this KM process is not part of the project management process, there are no consequences for project managers.

Our recommendation: The company should integrate the KM process into the project management process landscape. Project closure or client billing should not be possible without a quality-assured debriefing. Appoint a knowledge manager responsible for quality assurance from a functional perspective.

Cooperation & Culture

Companies often have not come to grips with prevailing cultural barriers when introducing KM. Obstacles such as the fear of losing internal power when sharing core competencies, or risking sanctions when disclosing negative

experiences, need to be explicitly addressed as key issues of KM.

Practical Example: The research division of a global producer of kitchen appliances has a comprehensive and well-structured KM concept to support its innovation processes. It focuses on idea generation and exchange of technology and market knowledge for new product areas. Yet, the knowledge exchange among division staff is very superficial and incomplete. Striking insights resulting from internal or external research activities are almost never exchanged due to fear of losing credit for subsequent innovations based on these research results.

Our recommendation: The company should not promote a purely anonymous knowledge exchange. Instead, it should establish cross-divisional communities of practice to support the personal, bilateral trade of knowledge based on a relationship of mutual trust. Knowledge management should be considered as people management. Once a trust-based internal knowledge market is established, a more anonymous trade of documents comes into play – steal with pride, share with delight.
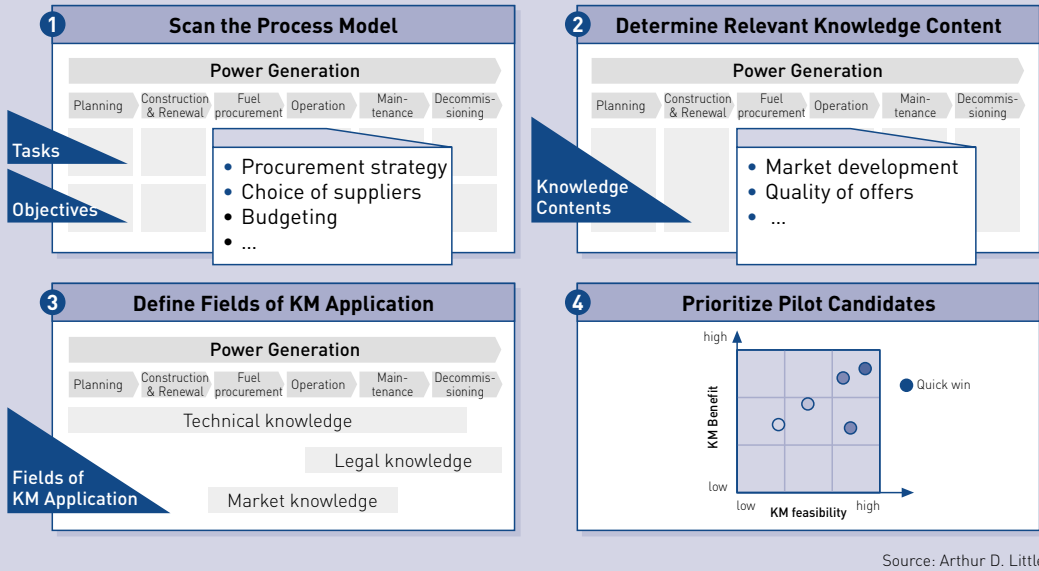
Technology & Infrastructure

KM tools such as multi-functional, intranet-based knowledge portals are indicative of steadily advancing IT innovations. They enable special application of KM in many cases, but do not replace a thorough KM concept, although this fact is oftentimes neglected by technocratic organizations. After initial excitement, stand-alone IT enablement may slowly slide towards frustration for users.

Practical Example: The aforementioned producer of information and communication equipment has multiple stand-alone KM tools running that do not interconnect into a clear KM concept. As some of these tools do not meet user requirements, the organization's satisfaction with IT support is limited, although IT-expenditure is significant.

| Exhibit 3 | Identification and Prioritization of KM Pilots |

KM pilots can be defined by identifying relevant knowledge areas in the process model and prioritizing corresponding fields of KM application.

1 Scan the Process Model

Power Generation

| Planning | Construction & Renewal | Fuel procurement | Operation | Main-tenance | Decommis-sioning |

Tasks

Objectives

- Procurement strategy
- Choice of suppliers
- Budgeting
- ...

2 Determine Relevant Knowledge Content

Power Generation

| Planning | Construction & Renewal | Fuel procurement | Operation | Main-tenance | Decommis-sioning |

Knowledge Contents

- Market development
- Quality of offers
- ...

3 Define Fields of KM Application

Power Generation

| Planning | Construction & Renewal | Fuel procurement | Operation | Main-tenance | Decommis-sioning |

Technical knowledge

Legal knowledge

Fields of KM Application

Market knowledge

4 Prioritize Pilot Candidates

high

KM Benefit

● Quick win

low

low   KM feasibility   high

Source: Arthur D. Little

Our recommendation: This company should establish a KM concept top-down with an ultimate business objective in mind: Think about content, processes and culture, before determining the KM media needed. Finally, develop suitable IT-support from an end-user perspective.

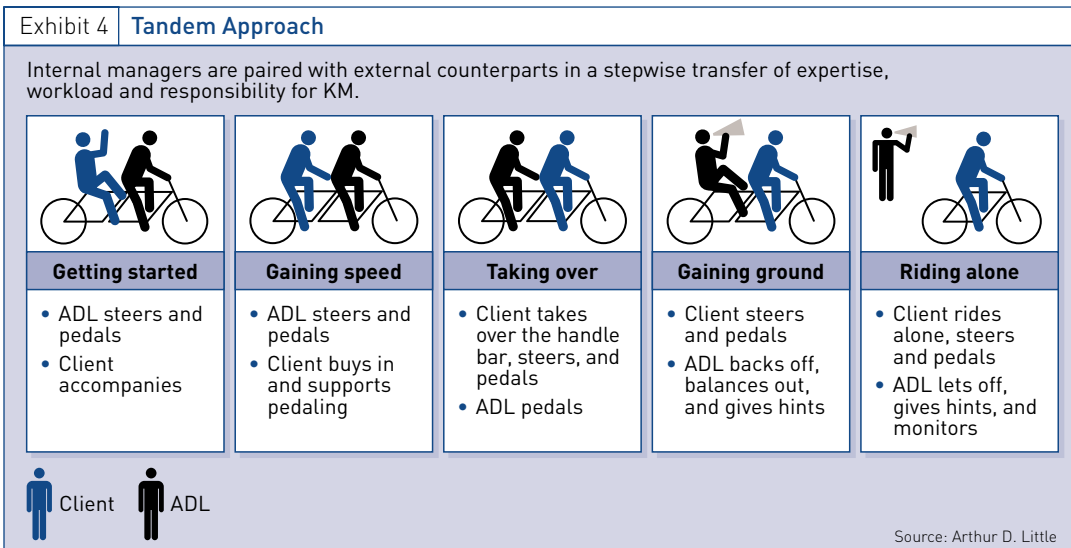### 3. Obtaining Broad Buy-in During the Concept Implementation

Top management commitment and conceptual excellence will not guarantee a KM success story. Rolling out a suitable KM concept in an organization is an art in itself. The third critical success factor is obtaining company-wide buy-in for the concept. Such broad buy-in can be supported through thinking big but starting small – sequentially rolling-out small, targeted and ultimately successful pilot applications. Buy-in can be further leveraged by early involvement of the KM target audience through the tandem approach that uses participation as its main driver.

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Prioritizing Pilots

Beyond development and introduction of an IT solution, the implementation of a KM concept includes the roll-out of KM processes and organizational responsibilities. Clearly, these steps may imply significant changes for an organization. Practical experience shows that the implementation of a complex KM concept over multiple divisions is best done sequentially – starting with a focused pilot or internal test market, demonstrating its success, and then expanding in single steps. A successful pilot is likely to trigger a snowball-effect, smoothing the path for a sequence of follow-on pilots and hopefully for the establishment of a company-wide KM strategy.

Exihibit 3 illustrates how to identify and prioritize KM pilots for a utilities corporation. It starts with a scanning of the business process model to determine the relevant knowledge, to define fields of KM-application, and to finally prioritize ideas. To maximize the chance of success of the KM venture, it is wise to first focus on pilot candidates with high impact and low risk of failure, the so-called quick wins, before tackling more complex fields of application.

The Tandem Approach ©

Exhibit 4	Tandem Approach

Internal managers are paired with external counterparts in a stepwise transfer of expertise, workload and responsibility for KM.

Getting started	Gaining speed	Taking over	Gaining ground	Riding alone
• ADL steers and pedals • Client accompanies	• ADL steers and pedals • Client buys in and supports pedaling	• Client takes over the handle bar, steers, and pedals • ADL pedals	• Client steers and pedals • ADL backs off, balances out, and gives hints	• Client rides alone, steers and pedals • ADL lets off, gives hints, and monitors

Client   ADL

Source: Arthur D. Little

An additional means to generate buy-in is to assure early ownership for the KM concept. Many companies make use of external partners for development and roll-out of their KM concept. Still, KM is not automatically recognized as tailored to the company's needs. Experience has shown that external support and proprietary development of a KM concept can be well balanced through Arthur D. Little's Tandem Approach © illustrated in exhibit 4. Internal project managers are paired with external counterparts, working side-by-side, jointly defining the KM concept and roll-out in an interactive approach. Besides leveraged buy-in, the tandem approach also allows a transfer of KM experience and expertise, as well as a fair split of workload throughout the project.

The Tandem Approach ©: Internal project managers are paired with external counterparts, working side-by-side, jointly defining the KM concept and roll-out in an interactive approach.

4. Staying Persistent on KM

Once top management commitment is given and a viable KM concept is in place, KM has to be lived by its target audience. To realize the KM benefits once projected to obtain top management commitment, the adequate use of KM must be actively monitored, to allow early management response if things go astray. Hence, the fourth KM success factor is persistence.

There are different approaches to KM persistence, ranging from discrete motivation to continuous enforcement. Choice of one approach or another will ultimately depend on the company's management style. Yet, given quantitative expectations at the outset of a KM venture, a logical approach to KM persistence would follow up on the projected quantities – you get what you measure. This can be done through a KM controlling concept, possibly in conjunction with a KM scorecard or knowledge scorecard monitoring key indicators, or even a KM cockpit coordinating worldwide KM activities.

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Insights for the Executive

KM, just like any innovation, has as much to do with inspiration as with perspiration. The main fact behind this reasoning is that corporate knowledge has as much to do with the people in an organization as with the organization itself. Companies that have understood that KM can do as much for them as R&D and marketing, have made the first important step into the right direction. KM is a management tool, providing a multitude of tangible benefits at strategic and operative levels. Companies wanting to reap these benefits need to handle the critical success factors for KM.

The first and foremost step is generating commitment at the level of top management. Only if the organization has the buy-in of top executives will it be able to proceed to the next step: Working out the right conceptual mix. In going through this phase companies have to accept that there is no one-stop-shopping solution to KM for their organization. Rather they need to work out a solution that is tailored to its individual needs. Only a tailor-made concept for the organization will win the buy-in of employees – which is most important, as they are the ones who will turn the concept into reality. But the task is still not finished. Such ventures take time and for organizations to be really successful it is necessary that they stay persistently involved in the concepts they have worked out.

Arthur D. Little has helped many clients with its Tandem Approach ©. This methodology was specifically developed to help clients side-by-side to not only plant the seed of KM in their organization but to foster the saplings and help the organization grow it.

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