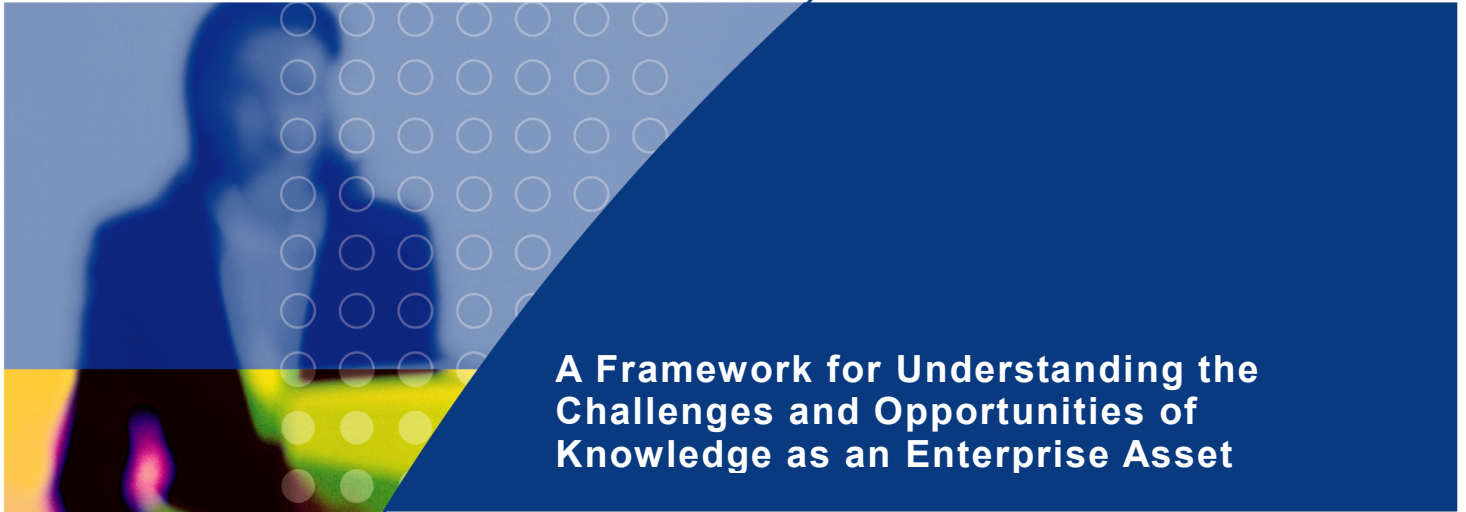


The Knowledge Pyramid:



A Framework for Understanding the
Challenges and Opportunities of
Knowledge as an Enterprise Asset



CORTICON



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Table of Contents

Introduction	1
Implicit Vs. Explicit Knowledge	1
Documented Knowledge	2
Actionable Knowledge	2
Automated Knowledge	3
How Corticon Impacts the Knowledge Pyramid	3
Summary	4

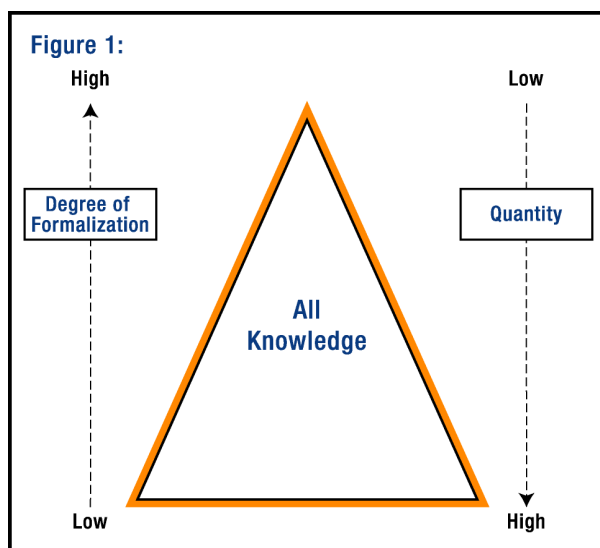
About This White Paper:

This white paper discusses the challenges and opportunities of leveraging knowledge as an enterprise asset. It introduces a framework, the Knowledge Pyramid, which helps to understand how knowledge increases in value with increasing degrees of formalization. It goes on to describe the Holy Grail of formalized knowledge – automated knowledge – and describes the challenges thereof. Lastly, it introduces the Corticon Decision Management Platform, a unique and powerful solution that is available today to help companies transform their knowledge assets into critical business decisions that can be implemented consistently and efficiently across the enterprise.

Introduction

A company's intellectual capital, or collective business knowledge, is one of its most valuable assets and the primary source of sustained competitive advantage. But knowledge itself is only half the equation: consistently applying, scaling, and improving knowledge drives the true value. A company prospers in dynamic markets by applying collective knowledge to make optimal decisions in the face of uncertainty and imperfect information. But how best to leverage collective knowledge in light of the following obstacles?

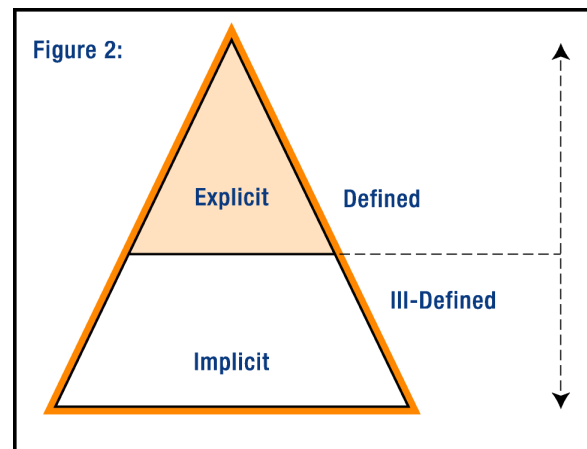
- Employees accumulate specialized knowledge over years of experience and training, but if they leave the company, their knowledge leaves, too.
- Experienced employees are in short supply, and companies are finding it increasingly difficult and expensive to recruit talent in order to scale their businesses.
- Even experienced employees have bad days. Consistent application of best practices is the key to quality.
- Current automation technologies fail to capture the complexity of human decision-making; and when they do, the hard-coded knowledge contained is inaccessible to the human user.



Corticon introduces the concept of a Knowledge Pyramid to illustrate and clarify the nature of the problem and to propose a framework (and software products which support the framework) for reducing this risk. In figure 1, the body of collective business knowledge is represented by a pyramid; the quantity of knowledge decreases as it becomes more formalized. Conversely, less defined and structured knowledge is usually present in much higher quantities.

Implicit Vs. Explicit Knowledge

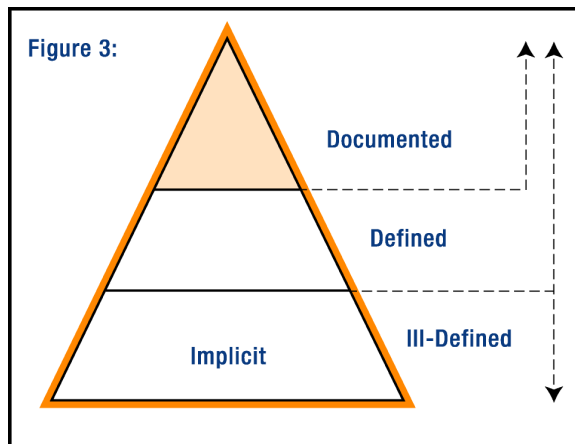
Your employees make business decisions using the judgment and instinct developed through their work experience. They may not be able to articulate their thought processes or precisely explain the reasons for their decisions, but their cumulative experience often gives them a "feel" for the best way to overcome problems they encounter. This *implicit* or ill-defined knowledge is extremely valuable to employers, and is also most vulnerable to loss when employees leave.



A goal of every company should be to create best business practices by capturing, retaining, and distributing as much implicit knowledge as possible from its most valued and experienced employees. Knowledge becomes *explicit* when it is defined, explained, or communicated to another person, even informally. But whether implicit or explicit, the knowledge is still inextricably linked to the employee or employees who carry it.

Documented Knowledge

Creating policies and defining procedures are critical first steps in a company's effort to retain valuable business knowledge. Once knowledge is **documented**, it can be organized, published, revised, and managed so as to permit consistent application throughout an organization. Employees can be trained and held to uniform standards. And, importantly, documented knowledge stays with the company when employees leave.



However, documentation by itself does not fully solve the problem. Most documented knowledge is, by the nature of human language, inadequate for the preservation and reuse of corporate intellectual capital. Most procedures and policies contain ambiguity, and therefore still require human judgment to implement. If policy application remains dependent on implicit knowledge, then consistency and quality will be difficult to achieve. An example of documented knowledge might appear in an employee expense account policy:

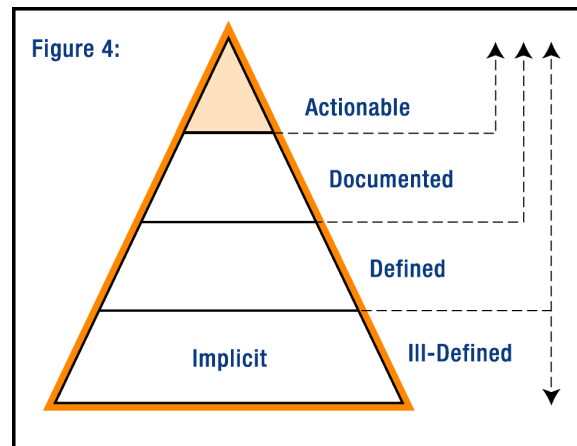
1. "Employees are expected to minimize travel expenses; claims should be limited to necessary business expenses or appropriate customer entertainment."

While this statement meets all requirements for documented knowledge, it still requires interpretation and judgment on the part of each employee. Terms like "minimize", "appropriate" and "necessary" lack precise

definition. As a result, it can be expected that the types and amounts of expenses claimed will still vary considerably from one employee to the next. Also, the statement is incomplete: specifically, are these the only types of reimbursable expenses permitted? In the absence of any further guidance, employees must exercise judgment when deciding which expenses to claim.

Actionable Knowledge

Disciplined refinement and structuring of documented knowledge creates **actionable** knowledge. Here, all incompleteness and ambiguity have been removed, and policies and procedures can be executed without possibility of misinterpretation. Actionable knowledge does not require the application of judgment in its execution – the employee can take confident action based on the statement alone. Actionable statements from the expense policy example might look like the following:

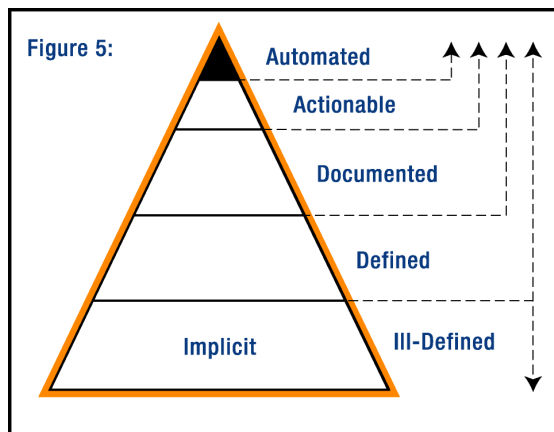


1. "Each employee will limit non-entertainment meal expenses to \$35 per day while traveling on company business."
2. "Business travel must be approved in advance by the traveling employee's immediate supervisor."

These statements leave nothing open to interpretation. Much greater consistency in travel expense claims can be expected as a result of these actionable statements.

Automated Knowledge

Finally, actionable knowledge can be **automated**. Because actionable knowledge contains logically structured, complete, and unambiguous statements, it can be readily translated into computer-executable code. A computer program containing actionable statements such as those above, could automatically determine whether violations to a company's travel expense policy exist. In such a system, the user (an employee seeking reimbursement) would be notified of violations immediately in the form of the actionable knowledge statements (or business rules) that have been violated.



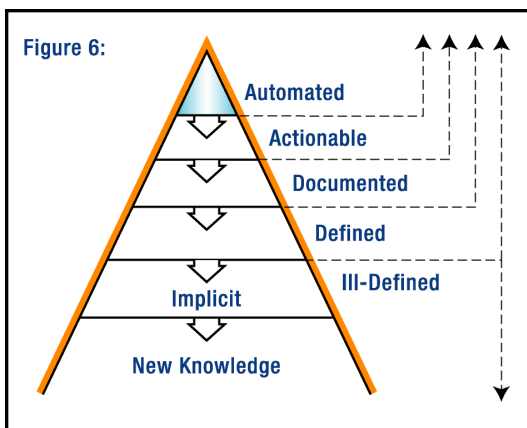
Automation presents its own challenges. Attempts to automate business knowledge in the past have included expert systems or other applications with artificial intelligence (AI) capabilities. The results have been disappointing for 2 primary reasons: first, the automated knowledge has been executed as “black boxes”, meaning that the underlying logic is not visible to the user. While employees can use the system, they cannot learn from it so opportunities to improve and expand the knowledge base are lost. This deficiency is represented in figure 5 by a solid-colored peak. Secondly, the resources necessary to build and maintain these systems were (and still are) scarce and very expensive. Programmers with training in knowledge engineering are required to capture or update the business knowledge, and such activities often take weeks or months to complete. Together, these difficulties have resulted in very small amounts of actionable knowledge being automated in business software.

How Corticon Impacts the Knowledge Pyramid

Recognizing both the value and the challenges presented by the knowledge pyramid, Corticon introduces a powerful and unique solution: the Corticon Decision Management Platform. The Decision Management Platform and associated methodology allow business people to transform their knowledge into critical business decisions. These critical business decisions are captured, automated and deployed as interrelated sets of business rules through the following activities:

1. **Discover and Document the Knowledge**
Using a proven, facilitated approach, the Corticon Methodology assists in the discovery of explicit knowledge from its source, including people, documents and existing systems. The knowledge is captured in the context of pertinent business decisions, and expressed in the form of business rule statements, as defined and understood by the business people.
2. **Formalize the Knowledge**
The Corticon Platform enables a business analyst to transform the documented knowledge (in the form of business rule statements) into an actionable, formalized, and automatable software components. Unique and proprietary algorithms automatically identify all ambiguity, incompleteness, redundancy and contradiction, ensuring truly actionable business knowledge. The decision components, called Corticons, can be tested against existing data, all without the need for programmer assistance.
3. **Automate the Knowledge**
The Corticon Decision Management Platform enables the deployment of Corticons to distributed enterprise systems, enabling the scalable and reliable automation of a companies best practices. The Corticon Server utilizes open standards including Enterprise Java and XML to ensure integration as well as scalability within the existing infrastructure. (Note: Initial deployment requires programmer assistance).
4. **Share the Knowledge**
When a Corticon-enabled application operates, the reasoning behind system decisions and actions can be fully revealed to the user. The reasons are simply the outcome of the formalized knowledge as it is applied against specific business events. The logic behind the system can be made visible to any authorized users,

preventing the “black-box” syndrome common in nearly all other methods of knowledge automation. This ensures that a user understands and can learn from system behavior. In addition, necessary changes are much easier to identify. Figure 6 captures this important distinction by depicting the Pyramid’s peak as a transparent, rather than solid, section.



5. Manage the Knowledge

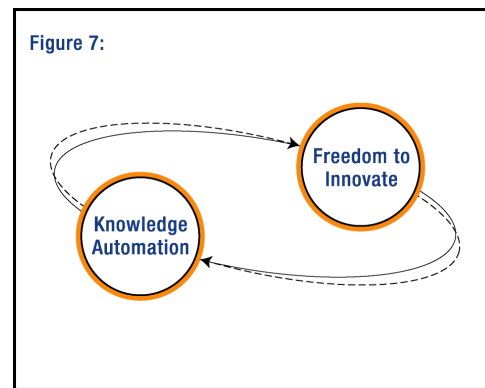
The Corticon Decision Management Platform enables business analysts to build and maintain flexible applications that can be easily adapted to reflect business change. Changes in any element of business knowledge (i.e. policy, regulation, strategy) can be rapidly traced to the specific Corticon decision component that implements that knowledge (as interrelated business rules). With conventional software design, changes to code late in development, or after deployment, are extremely risky, costly and time-intensive. But because the logic in Corticon applications is exposed as easily understandable and traceable business rules, ongoing, iterative development is enabled.

6. Evolve the Knowledge

Most importantly, Corticon’s software, by automating rote business activities, increases the human resources and intellectual capacity of your business. Inventing and discovering new and better ways to conduct business (or new knowledge) is the very heart of sustainable competitive advantage. As best practices are identified and formalized, they can also be immediately automated using Corticon Decision

Management. This benefit is illustrated in figure 6 by an expansion of new knowledge into the Pyramid’s base. The new knowledge often arises implicitly, and the process of elevating it and formalizing it into actionable and automated business decisions recommences.

Using the Corticon Decision Management Platform, the process of knowledge automation builds value upon itself. Through widespread adoption, an Increasing Returns Dynamic is achieved: The more knowledge that is automated across the extended enterprise, the more people gain the freedom to innovate. With more freedom to innovate, more knowledge is created and automated, driving continually improved results.



Summary

The Knowledge Pyramid is a framework for understanding how competitive advantage depends on the retention, expansion, and systematic automation of collective knowledge. The discussion illustrates the critical risks of today’s enterprise, including employee attrition, the scarcity of human capital and the demands of a dynamic marketplace.

In response, Corticon offers the most comprehensive solutions available to address each layer of the Knowledge Pyramid, maximizing the benefits of collective knowledge while minimizing the risk of its loss. Corticon’s innovative software platform enables the capture, formalization, and business decisions in a scalable, reliable multi-tier enterprise architecture. Finally, Corticon-enabled applications may be easily adapted to new business conditions as fast as a company can develop the strategies, policies and procedures to address them.