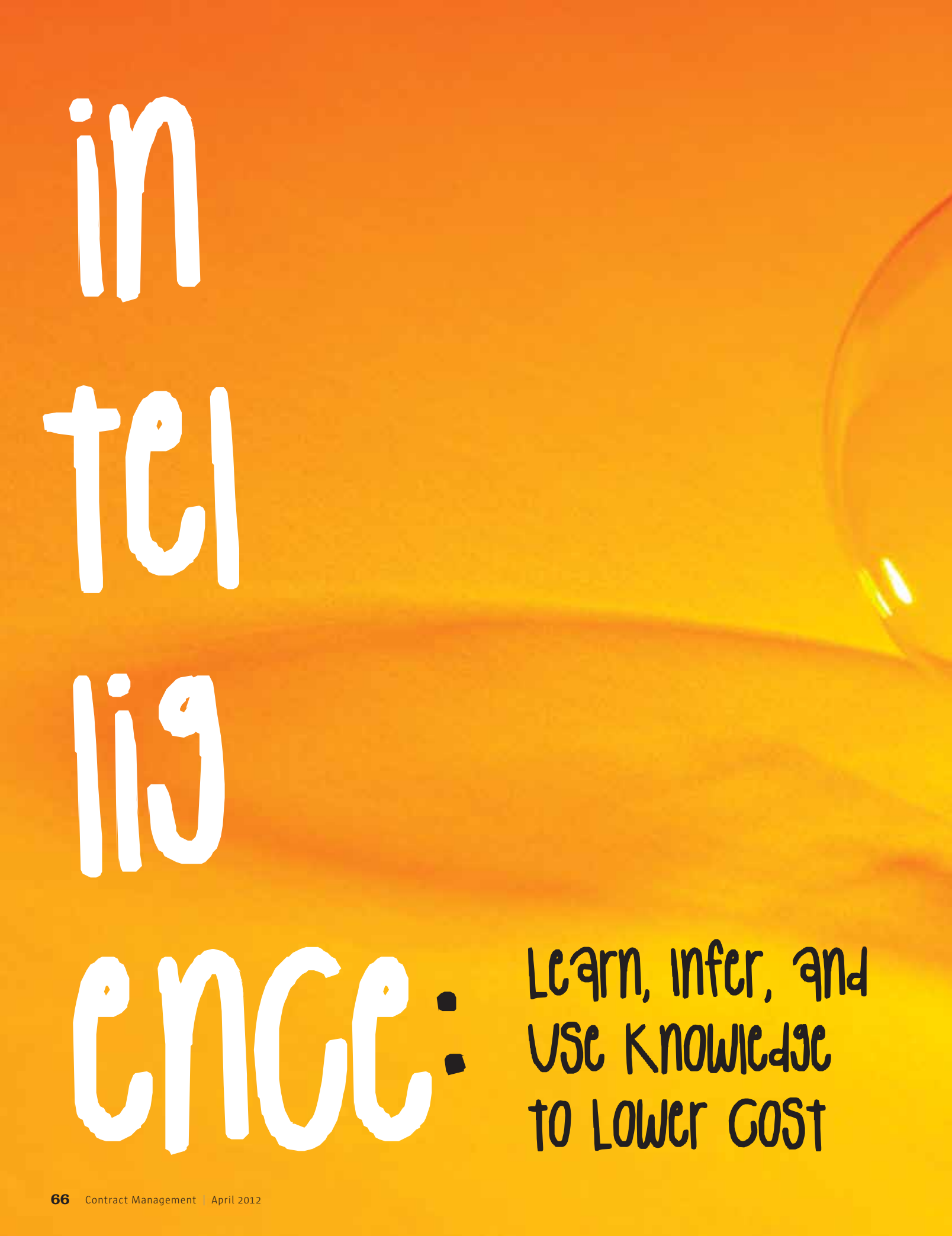
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Learn, Infer, and
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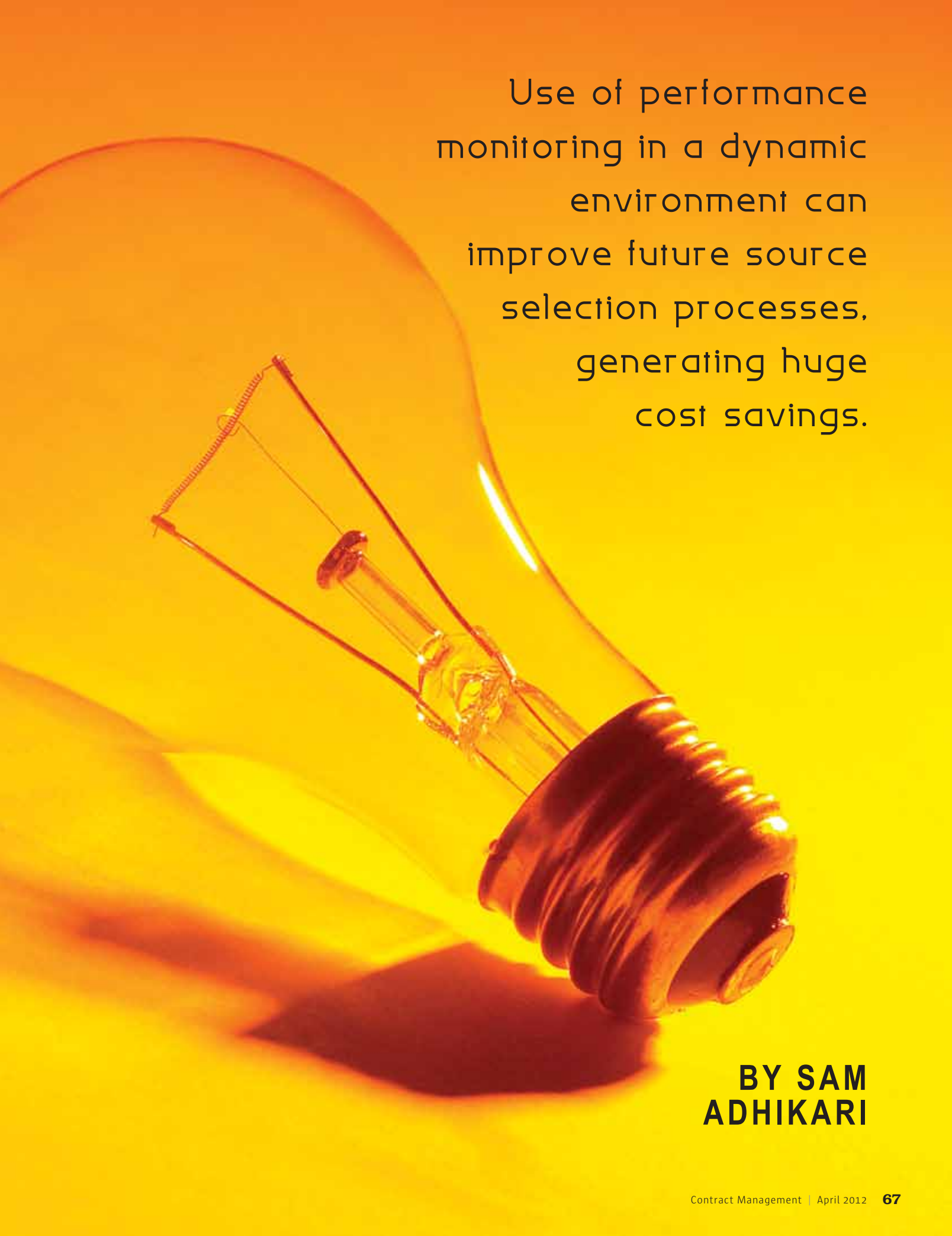
to Lower Cost

Use of performance monitoring in a dynamic environment can improve future source selection processes, generating huge cost savings.



BY SAM ADHIKARI

Artificial Intelligence

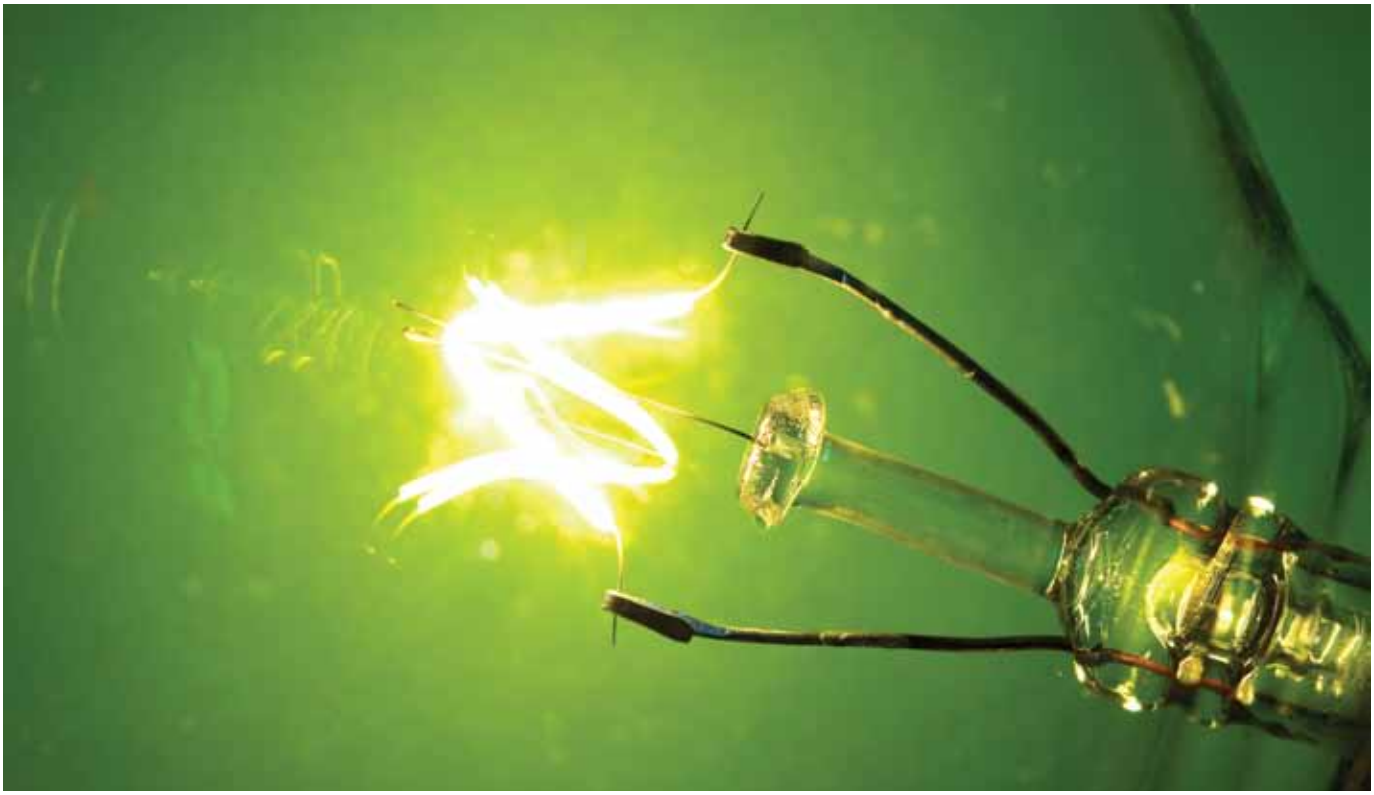
is based on learning, inferring, and using pattern recognition from a knowledge base. There is no reason why we cannot use it in acquisition and contract management processes to generate higher project efficiency and cost reduction necessary for the current economic environment.

Procurement agencies are currently exploring innovative means of lowering project costs while maintaining responsible, accountable, transparent, environmentally sustainable, and regulatory compliant acquisition processes. The use of proposal evaluation tools and collaborative systems definitely provides the initial steps necessary to achieve an objective and transparent evaluation process. These systems also provide an environmentally sustainable process by making context-sensitive documents easily available for an online environment and an audit trail available for use in case of protests. However, the massive cost reduction in complex and dynamic projects requires "intelligent"[1] systems that can learn from past mistakes.

Establishing the Concept of Performance Measurement in a Dynamic Environment

One of the biggest hurdles for measuring the performance is the complexity that arises from the dynamic parameters that can change during the contract performance period. For example, if we try to measure the performance of a vendor providing cleaning services in an educational institution, what happens if the enrollment rises sharply in a semester? How do we adjust the performance measurement parameters and standards as the dynamic variations of this nature take place? Mathematical and statistical tools can take care of these types of complexities. Accurate and unbiased performance measurement is critical for the understanding of the value generated from the cost of a contract.

In the real world, performance measurement has several components. Eventually, value is generated from the effectiveness of carrying out a project's mission. In the case



of cleaning services in an educational institution, what matters is how the students and faculty perceive the cleanliness of the building facilities, and how that impacts the future enrollment and working environment. Performance measurement models can be operationally very complex. This is one of the main reasons why performance measurement is not used in many agencies.

Performance measurement can be divided into several components, which, in a simple and effective model, can include the following.

Measurement of Operational Field Performance from a Standardized Questionnaire

The operations managers, vendor representatives, and others answer these questionnaires periodically based on performance criteria.

End-User Perception Studies

Survey tools or Web-based systems can be used for receiving input from the end-users. The tabulated data from the end-user survey can be fed back into the performance monitoring system.

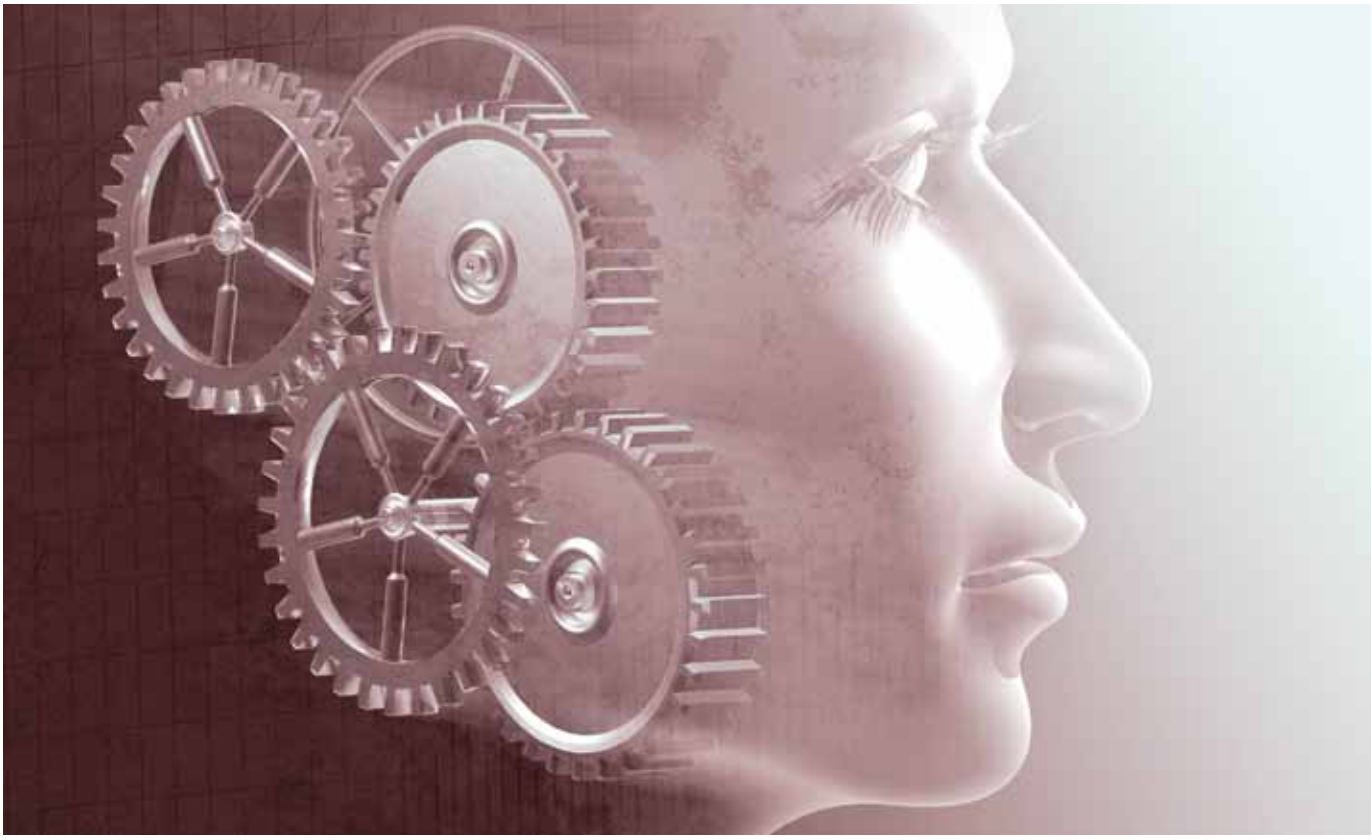
Performance Log for Emergencies

A log can be maintained per vendor service that will document emergency calls and how fast the vendor can respond to take care of the situation. It allows for the input of comments from the vendor as well as the operations managers. The process can quantify and consolidate vendor performance metrics based on emergency response handling. The consolidated data can be fed back to the vendor performance monitoring system.

Using the Performance Data to Improve Future Source Selection Processes

The ability to easily identify the "best-qualified"[2] firm or proposal is a very complex process. It involves the selection of the right criteria, metrics, subject matter experts as evaluators, and an evaluation process that suits the request for proposal. By ensuring the selection of the most-qualified firms, the practitioners can anticipate that they will realize cost savings by having projects completed on time and within budget.

Selection and application of the right criteria, metrics, and evaluators are some of the biggest challenges in this process. The presence of a dynamic environment and massive uncertainty make the process even more complex. The evaluation can be good but it can always be better; there is no "best" evaluation. Past contract performance feedback forms the most important input for evaluating how well the evaluation process worked in the past, and how to improve the same in the future. Performance feedback provides the learning opportunities for the future evaluation processes. An intelligent



system continuously improves the process, criteria selection, cost models, and risk analysis. The goal of an intelligent self-correcting evaluation process is to provide, over a long-term period, the most optimal source selection process given the uncertainty and dynamic nature of the real world.

Intelligence from Pattern Recognition

Human cognition is the result of pattern recognition. We make decisions based on our ability to recognize patterns that have worked well before. In the absence of recognizable patterns, we anticipate decisions based on the best available patterns that have worked before. An artificial intelligence system works the same way. It searches for patterns that have worked before. It learns from past mistakes. As the system grows from the availability of recognizable successful patterns, it becomes more knowledgeable and performs more intelligently. Experts can provide readily available patterns the system can use. The performance monitoring data feeds these patterns into an "intelligent" source selection process. The system can recognize how to fine tune the future selection processes so that the contract performance can augment, resulting in better value. The details of these successful patterns are archived in a library readily available to the "intelligent" evaluation process.

A Word of Caution on Intelligence

Intelligent systems can sometimes act as "dumb" systems. The pattern recognition process is often impossible to implement using our current computing technologies. This is why the evaluation process should be a collaborative system with human agents as experts. Human intelligence is far superior to any machine intelligence implemented thus far. The proposal evaluation system therefore should be a collaborative group decision support system. In a so-called "intelligent" system, it is easy to lose the focus of the basic purpose of the system. For example, an evaluation system must be ready to support the response in case of protest. It is easy to run after recognizable patterns of performance and lose the audit trail capability. In these "intelligent" systems, it is also common to end up with a very complex source selection process. This is why it is critical for the evaluation process to be able to support a project management process. Complex evaluation processes often lose track of award dates. Tracking the evaluation progress is essential to completing the evaluation process on time. The real test of the evaluation system is when it is tested during the evaluator meetings. If the meeting is facilitated by the system, it is regarded as a useful system for completion of the evaluation project. If a system is highly "intelligent" but is perceived as being too complex so that evaluation projects cannot be completed on time, then it is deemed a failure even before being tested as an "intelligent" cost-saving system.

The responsible, accountable, transparent, environmentally sustainable, and regulatory compliant acquisition process is so flexible that it can morph along with an organization's fundamental needs. Intelligent

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systems often lose that ability. A proposal evaluation process should be flexible to accommodate specific types of solicitations, regulatory compliances, and processes that are in use for other reasons. The biggest problem of artificial intelligence arises when we believe it can supersede human common sense and best practices developed through tested mechanisms.

The cost of resources required to evaluate a set of proposals and the contract performance measurement is critical. Many organizations give up using these "intelligent" systems as the cost of operating such systems become far more than the perceived cost reduction from available pattern recognition models.

Simplification is the Best Ingredient for Intelligence

Intelligent systems in the real world are simple. The trick lies in managing the complexity of such systems over time. Failed systems have a common pattern—the exponential growth in complexity over time. Even a traditional software system that uses a traditional relational database fails as the practitioners allow the database to grow beyond need over time. Those who have implemented enterprise resource planning systems know that very well. This is why intelligent acquisition systems should be manageable in terms of complexity and cost.

Conclusion

Your team's discerning use of an intelligent source selection process is likely to produce massive cost reduction over the long run. However, it is critical to establish an effective contract performance measurement system in a dynamic environment and implement a learning process from past mistakes. An intelligent and knowledgeable source selection process should also be simple and cost effective. **CM**

ABOUT THE AUTHOR

SAM ADHIKARI is the vice president of operations and research at Sysoft Corporation. He teaches supply chain management, operations management, and information technology for managers at The Rutgers University Executive MBA program. He is affiliated with the Greater Philadelphia Chapter of NCMA. He can be reached at **sadhikari@sysoft.com**.

Send comments about this article to cm@ncmahq.org.

ENDNOTES

1. *See, e.g.,* **www.intelligent-systems.com.ar/intsyst/intsyst.htm**.
2. *See, e.g.,* **www.ago.noaa.gov/ago/acquisition/docs/best_practices_for_source_selections.doc**.