



# Evaluation of knowledge management performance: An organic approach<sup>☆</sup>



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## ABSTRACT

Knowledge management (KM) strategy is the planned or actual coordination of a firm's major goals and learning, in time, that continually co-align its knowledge-based resources with the environment. This study combined a survey study and system dynamics (SD) simulation to demonstrate an organic KM performance evaluation approach. The survey study was conducted based on a sample of 143 construction contractors, and used structural equation modeling (SEM) techniques to develop a KM performance index for reviewing the key elements that underpin KM strategy. The SD simulation predicted the development of KM strategy configurations and the evolution of KM performance over time.

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## 1. Introduction

In the current knowledge economy, knowledge is an essential strategic resource that enables firms to sustain a competitive advantage in a dynamic market environment [32,76]. The essence of knowledge management (KM) is to develop a special dynamic capability, a knowledge management capability (KMC), that aligns firms' knowledge resources with the needs of the changing market [31,52]. KM strategy seeks to achieve this alignment by developing governance mechanisms and learning routines, which constitute the micro-foundations of the KMC [29]. Governance mechanisms are deployed to facilitate organizational learning, which reconfigures knowledge resources and operating routines to deliver services and products that meet the needs of the market at any time in its evolution [28]. The validity of the resource and capability alignment is indicated by business performance outcomes [92]. In this sense, KM strategy is organic [24,78]: it

co-ordinates the co-alignment of internal knowledge resources and the KMC with the evolving market. The evolution of KM strategy is underpinned by complex feedback and reciprocal influences between governance mechanisms and learning routines that develop over time in a non-linear manner.

The organic perspective of KM strategy has two significant implications for KM performance evaluation. First, the evaluation should assess whether the micro-foundations of the KMC are sufficiently developed to achieve the desired performance at any specific time during market evolution. Therefore, both performance drivers (i.e., governance mechanisms and learning routines) and performance outcomes should be evaluated. Second, the evaluation should support the review and planning of KM strategy. The evaluation approach should be able to (1) review mechanisms and routines that have been deployed and the performance achieved and (2) predict the evolution of performance drivers and outcomes in a future period to facilitate strategic planning.

In the current literature, the conceptualization of KMC provides limited assertions to address the complex interdependent and reciprocal relations between governance mechanisms and learning routines; these relations drive the evolution of KMC, allowing it to respond to the stimuli of the external market. Due to this limitation, the empirical research on organic KM strategy lacks conceptual guidance. Few studies have addressed the evolution of complex learning systems [78], where knowledge governance

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mechanisms and learning routines underpin the evolution of KMC [52,92] and performance outcomes inform the validity of the capability alignment [1,65]. Limited understanding of the organic nature of KM strategy further leads to fragmented and static KM performance evaluation approaches in the literature. Most KM performance evaluation frameworks follow the mechanistic perspective of strategy [24]. With a synchronistic view of time and a directional view of flow [24], these evaluation approaches only review implemented KM strategy and realized performance and fail to predict the potential evolution of the learning system. Thus, mechanistic evaluation approaches provide insufficient information to support KM strategy planning in a dynamic environment.

Two research issues need to be addressed to resolve the problem areas highlighted in the literature. First, it is important to re-conceptualize KMC based on recent advancements in the strategic management literature concerning continual capability realignment in time [1,52,82]. Second, it is important to use the reconceptualization to guide empirical studies. Empirical evidence developed from this research approach has considerable potential to improve the understanding of complex learning systems [78,79] and to inform the development of KM performance review and prediction methods. The empirical findings will help firms to undertake measurable strategic review and planning within KM implementation. This study endeavors to address these two research issues through four objectives. The first objective addresses the need for KMC reconceptualization by drawing on the theoretical lens of the dynamic capabilities view (DCV) [37]. The other three address the need for empirical investigations to develop an organic approach to evaluate the performance of capability-based KM strategies. In line with these four objectives, the study seeks to answer five research questions:

- (1) What are the key constructs that constitute the micro-foundations of the KMC?
- (2) Can the KMC be used to explain the performance heterogeneity of firms?
- (3) How can KM performance be reviewed at a specific time by measuring both performance drivers and outcomes?
- (4) What are the interdependent and reciprocal relationships between the key constructs and business performance?
- (5) How can KM performance be predicted by visualizing the evolution of the performance drivers and outcomes over time?

The empirical findings, which answer the first two questions, provide new insights into the micro-foundations of KMC as well as its strategic implications, thereby supporting the KMC reconceptualization. The KM performance index developed by this study demonstrates a performance review approach to a specific historical time and answers research question 3. The findings relating to question 4 reveal the interdependent and reciprocal relationships between the micro-foundations of the KMC and business performance. Question 5 is answered through a system dynamics (SD) simulation analysis that demonstrates a relationship-driven approach to predicting and visualizing the evolution of the KMC and performance.

This paper is structured as follows. Section 2 addresses the first research issue and fulfills the first research objective: to reconceptualize the KMC concept based on the integrated perspective of knowledge-based dynamic capabilities [52] that has recently emerged from advancements in the areas of knowledge management [e.g., 33,59,60], absorptive capacity [e.g., 14,49] and dynamic capabilities [e.g., 82,92]. The reconceptualization explicitly recognizes and proposes dynamic and inter-dependent relationships between these three elements, which constitute the micro-foundations of the KMC. In this vein, a theoretical

framework is proposed to facilitate the study of the interdependent and reciprocal relationships of learning systems that underpin the evolution of the KMC and KM strategy. This section also discusses the implications of the organic perspective of KM strategy for KM performance evaluation. The fulfillment of this objective provides a theoretical foundation for the survey study and simulation.

Section 3 presents the methods adopted by the empirical study to address the second research issue. These methods helped the study to achieve research objectives 2–4 and demonstrated the transformation from mechanistic to organic KM performance evaluation. In this study, the organic perspective on strategy [24] was applied to study the reciprocal and interdependent relationships of the key constructs that underpin the capability-based KM strategy; this perspective reveals how the dynamics of the relationships drive capability evolution and strategy development. A diachronic concept of time was adopted in the empirical study to recognize that the micro-foundations of the KMC, the performance outcomes of KM strategy, and the relationships among them are parts of a continuous process and of the iterated sequences of a dynamic learning system. Following the approach suggested by Farjoun [24], the study maintains continuity: it first derives evidence from the mechanistic KM performance evaluation approaches through a survey study. Building upon this evidence, it subsequently moves to organic epistemological assumptions regarding time, flow, and construct coupling in a KM strategy to simulate its evolution through system dynamics (SD) analysis.

Section 4 presents the survey study, which fulfilled research objectives 2 and 3. The evidence is derived through hypothesis-testing approaches based on a set of cross-sectional data. Research objective 2 was to develop the KM performance index measuring the state of the KMC, its underlying micro-foundations, and the performance outcomes of the capability-based KM strategy at a specific point in time. The analysis achieved this objective by identifying the key constructs that constitute the micro-foundations of the KMC, revealing the performance implications of the KMC, and evaluating KM performance at a specific time, thereby answering research questions 1–3. Research objective 3 was to provide empirical evidence on the feedback loops and multiple reciprocal influences in the learning system formed by learning routines, governance mechanisms, and performance outcomes. The fulfillment of this objective addressed research question 4 and provided the information used to design an SD model to simulate the evolution of KM strategy and performance.

Section 5 presents the SD analysis, which fulfilled the fourth research objective: to simulate the evolution of the KMC and performance outcomes over time by applying the organic perspective on KM strategy to KM performance evaluation. The simulation results answer research question 5. Building on the evidence derived from the survey study, a system dynamics (SD) model [79,81] was developed to assess how governance mechanisms and learning routines are developed in time to derive a KM strategy that produces desired performance outcomes. The simulation demonstrates a method that evaluates and visualizes the KMC's evolution, which is driven by the interdependent and reciprocal relationships between the constructs of the learning system in time.

This study has sufficiently addressed the two key research issues of KM performance evaluation in terms of KMC reconceptualization and empirical research. The primary contributions of this study lie first in shifting the epistemological assumption from the mechanistic to the organic perspective [24] of KM strategy and KM performance evaluation and second, in demonstrating the shift through an empirical investigation. The empirical study identifies the micro-foundations of the KMC. The findings indicate that the path dependence, causal ambiguity and tacitness of governance

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