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## Routines and transactive memory systems: Creating, coordinating, retaining, and transferring knowledge in organizations☆

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### ABSTRACT

This chapter compares and contrasts the effects of two knowledge repositories, routines and transactive memory systems (TMSs), on knowledge creation, coordination, retention and transfer. We provide overviews of research on the two knowledge repositories, with particular attention to how they form and change. We then discuss the relationship between routines and TMSs. We also compare and contrast routines and TMSs in terms of their capabilities to promote knowledge creation, coordination, retention and transfer in organizations. Routines can transfer across organizations, and they are resilient to member turnover. Although routines can be a source of inertia, they can also enable change. TMSs are susceptible to member turnover and are not easily transferred to other organizations. TMSs promote innovation and are particularly valuable under conditions of uncertainty. We argue that TMSs and routines are reciprocally related. Routines can seed TMSs and TMSs can crystalize into routines. We hope that our chapter stimulates future research on the interrelationship between routines and TMSs and their effects on knowledge creation, coordination, retention, and transfer in organizations.

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**1. Introduction**

Our chapter compares and contrasts the effects of two knowledge repositories, routines and transactive memory systems, on knowledge creation, coordination, retention, and transfer. Knowledge in the two repositories develops as organizations learn from experience. Thus, the repositories capture knowledge learned in the past to affect organizational performance in the future. In spite of commonalities in their origins and functions, we argue that routines and TMSs have different effects on knowledge creation, coordination, retention, and transfer in organizations.

A routine is a repetitive pattern of interdependent tasks performed by multiple members of an organization (Feldman & Pentland, 2003). That is, a routine is a recurring sequence of tasks performed by different organizational members. For example, a hospital emergency unit might have the following routine for admitting patients who arrive at the unit. One staff member triages the patient to determine how urgently he or she needs care. If the need is not immediate, the patient is sent to another staff member who takes information about the patient, including insurance coverage and billing information. The patient is then sent to a third staff member who collects information about the patient's symptoms and vital signs. Next, the patient is sent to a waiting area. When staff and space become available, the patient is moved to a treatment room. There the physician does a physical exam, asks more questions about the patient's history, and, depending on symptoms, orders tests such as bloodwork. The physician then decides on a diagnosis and begins treatment appropriate for the diagnosis. Following this, the patient could be admitted as an inpatient, discharged, or kept in the emergency room for further observation.

This example illustrates several benefits of routines. They reduce uncertainty, provide a base for coordination, increase efficiency, and provide stability. The same sequence of steps is performed by different staff on different days. Indeed, a key feature of routines is that they are performed more or less the same by different members of an organization. According to Levitt and March (1988), "Routines are independent of the individual actors who execute them and are capable of surviving considerable turnover in the organization (p. 320)."

By contrast, a transactive memory system depends on the individuals who comprise the members of the team or organization. A transactive memory is knowledge of who knows what in a social unit. More formally, a TMS is a collective system for encoding, storing and retrieving information (Lewis & Herndon, 2011). A TMS includes knowledge of each member's specialized skills and expertise and the transactive processes that coordinate that expertise.

Let us return to the emergency unit example and consider two performances of the routine. In the first performance, when the test results come back from the bloodwork, everything is in the normal range. Based on the treatment protocol, the physician concludes that there is nothing wrong and decides to discharge the patient. In the second performance, after reviewing the test results on the patient, which suggested that nothing was wrong, the physician has a nagging concern that something might be. The physician remembered that another physician on the hospital's medical staff was doing research suggesting that although a blood test is the prescribed way to test for a certain condition, for a significant number of patients, the blood test is not sensitive enough to reveal the condition. The emergency unit physician

asks this colleague for advice. At this point, a TMS comes into play. Knowing who has specialized knowledge goes beyond the routine. The consulting physician examines the patient and orders more tests, which indicate the presence of the condition. Thus, consulting another physician who had specialized expertise enabled the patient's condition to be diagnosed correctly. The operation of a TMS involves knowing members' skills and knowledge and accessing that knowledge.

The enactment of a TMS depends on who the members of an organization are while the enactment of a routine is relatively independent of the organization's members. We argue that this difference in the degree to which routines and TMSs are dependent on the particular members of the organization has implications for the effects of routines and TMSs on knowledge creation, coordination, retention and transfer in organizations.

The chapter begins with sections on routines and transactive memory systems. Within each section we provide overviews of research on the two knowledge repositories, with particular attention to how they form and change. We then discuss the relationship between routines and TMSs. Following this, we compare and contrast routines and TMSs in terms of their capabilities to promote knowledge creation, coordination, retention and transfer in organizations. The chapter concludes with a discussion of future research directions that hold promise for advancing our understanding of routines and TMSs, their interrelationship and their effects on organizational outcomes.

**2. Routines**

Organizational routines are repeated, interdependent patterns of action (Cohen & Bacdayan, 1994). Organizations employ routines in order to achieve consistent levels of performance over time. Routines store the organization's past experience.

The foundational works of the Carnegie School, in particular *Organizations* (March & Simon, 1958) and *A Behavioral Theory of the Firm* (Cyert & March, 1963), introduced the routine concept, where routines are viewed as one of the means through which organizations retain memory. Nelson and Winter (1982) extended the idea in *An Evolutionary Theory of Economic Change*, where routines serve as the genes of the organization, passing knowledge through time. Routines are a key source of organizational capabilities in all of these works.

According to Cohen (2007), routines differ from individual habits. Whereas an individual can have a standardized, repeated process for accomplishing a task, routines are interdependent and involve multiple actors or performers. A routine for submitting a report would involve multiple performers performing tasks on the basis of the actions of the others. The individual habit for submitting a report would not involve other performers.

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