

Organisational Routines: Multiple Learning Mechanisms

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Abstract

Organisational routines are central to organisational learning processes and the conceptualisation of organisational routine is problematic as it has attracted multiple interpretations. This paper conceptualises routine at the cognitive and socio-interactional levels. Learning of routines take different levels of individual cognitions, group cognitions and organisational cognitions. The cognitions wholly internal to the individual take shape in the social and interactional activities of group and organisation. There are different mechanisms that suggest the development of group and organisational cognitions that become the foundation of organisational routines. The different mechanisms of social and cognitive processes explicate the way routines are actively learned in the organization.

Keywords: *Organisational Routines, Shared Cognitions, Social Interactional Processes, Mechanisms of Cognitive-Interactional Learning.*

Organisational Routines

Organisational routines are found to be fundamentally significant in performance accomplishments (Cohen et al. 1996) and that enactment of routines holds the key to organisational effectiveness. Researchers have related organisational routines to organisational adaptation, innovation and learning (Feldman, 2003). Learning of organizational routine takes place at the cognitive and behavioural levels. According to Feldman (2003), there is a recursive relationship between cognitive changes and behaviour which implies that performances create and recreate the cognitions which can limit and accentuate the performance. In this paper attention is paid to the movement of shared cognitions at different levels of organisations resulting in the learning of organisational routines. The first part of the paper examines the nature and types of organisational routines, the second part of theoretical background deals with the social and the cognitive basis of learning of routines and the

third part treats the mechanisms of shared cognition in the learning of routines.

Introduction

Organizational routines are defined as “recurring patterns of behaviour of multiple organizational members involved in performing organizational tasks” (Feldman and Rafaeli, 2000). According to Becker (2004), however, routines are not just activity patterns, it can also be understood as cognitive regularities or recurring cognitive patterns or knowledge structures. Moreover routines also imply rules or more specifically ‘if-then’ rules, heuristics and rules of thumb, standard operating procedures, industry recipes and programs (Hall and Hitch, 1939; Cyert and March, 1963; Spender, 1989; Simon, 1977, all cited by Becker 2004). Another interpretation involves routines as dispositions (Hodgson, 2003) that manifest regular behaviour patterns of collective and connected nature

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(Feldman and Rafaeli, 2000) and also to express a thought in a regular manner (Hodgson and Knudsen, 2004).

Further, organizational routines are ‘effortful accomplishments’ of productive and processual nature (Becker, 2004). The processual nature is implied in the frequency of repetition, regularity of the frequency and that routine choices are also made under the time pressure (Becker, 2004). Along the lines of the distinction made by Feldman and Pentland (2003) organizational routines are characterized by a ‘performative’ part and an ‘ostensive’ part in which the former means the behavioural enactments or performances of routines and the latter implies the specific instantiations taken by specific individuals (Rerup and Feldman, 2011). Organisational routines can generally be defined as recurrent behaviour (covert and overt) patterns of collective and interactional nature. (Regular individual patterns of behaviour are referred to as habits). Tranfield, et al (2000) have categorised the organizational routine into standard, improvement and transformational where purpose becomes the criteria. Standard routines are the pervasive type and they are the most tangible, observable and frequently executed pattern of behaviour. Improvement routines are the regularized sequential forms of behaviour intended to bring about continuous improvements. And transformational routines comprise those exceptional /cyclical behavioural enactments that may bring about something fundamentally new in the organizational structure and processes.

Regardless of the purpose where the criteria of nature becomes important routines can be categorised into structural and functional routines. In the structural and design considerations, the routines may be in the direction of upward, downward and horizontal direction. Functional routines are based upon the grouping of similar activities and separation of dissimilar activities. And these routines can be in the realms of problem-solving, decision-making, leading, communication, promotion, hiring and firing, induction, motivation, performance evaluation, grievance redressal, discipline, supervision, budget, accounting and auditing, etc. In other words no organizational realm is free from newly learned and inherited routines. That is organizational routines are “established either through evolution or through the conscious design of someone other than the people participating in the routine” (Feldman, 2003).

Another dimension used to classify the routines is in terms of the level of complexity of the routine that is, routine can be either simple or complex (Becker, 2005). Simple and complex routines can be differentiated in terms of the task complexity and task interdependence. Task complexity involves the different steps and the number of connections between the elements and task interdependence is defined in terms of the

interdependence among the steps or the sequential relationships among the steps (Becker, 2005).

Plotting the variables of the nature of the routine and the level of complexity, the types of routines are diagrammed in Fig.1

Complex Level of Complexity	S2	F2
	S1	F1
Simple	Structural Functional Types of Routines	

Figure 1: Types of Routine

- **Type S1:** Rules and regulations, simple communication channels, simple delegated duties and responsibilities, simple interaction between the superiors and the subordinates.
- **Type S2:** Interdepartmental and organisational meetings, top management meetings, cross-level meetings, top-down and bottom-up interactions.
- **Type F1:** Single activities and combinations of activities constituting standard operating procedures and functions.
- **Type F2:** Planning, budgeting and strategy formulations that enable firms to carve a different niche in its operations.

The complexity and the way routines are enmeshed in the organisation make it evident that the emergence of routines cannot be left to an ‘invisible hand’ (Lazaric, 2011) or inheritance alone cannot be the candidate for the exercise of routines. The individual and the social practices constitute the most important link in the dynamic conceptualization and the embeddedness of routines in the organization (Lazaric, 2011) and here knowledge evolved through social and interactional practices becomes the cornerstone of learning of routines.

The Theoretical Background of The Study

Learning of routines starts with the individuals and the collective routines or organisational routines can be traced to the interactions of rules, interests, practices, activities and customs inherited and thus learned from the past and practiced in the present (Becker, 2004; Feldman, 2003). Learning in

organisations can be characterised by the states of knowledge not clearly perceptible and the behavioural changes perceptible (Fiol and Lyles, 1985). The crux of the learning of organizational routines involves the creation and the recreation of the cognitive patterns which become integral to the nature of the routines (Becker, 2004) and research has established a link between routinization and learning (Becker, 2005). Nelson and Winter (1980, cited by Lazaric, 2011) did not define routine as behavioural “lock-in” but as a source of knowledge that requires reformulation, renewal and relearning. According to Fiol and Lyles (1985) learning in organisations involves knowledge, structures, systems or actions. Routines are embodied with knowledge, structures, systems and actions. The invisible part of routine refers to routine as learned entities and the visible part refers to the learned performative and the ostensive levels (Rerup and Feldman, 2011). As cognition and actions are treated in a combinatorial manner (for e.g. Rerup and Feldman, 2011) and that cognition leads to action (Thomas, et al. 1993; Crossan, et al. 1999), the source of routines are to be traced to organisational cognitions or organisational memory. Enacting the same routine involves retrieving information from organisational memory (Levitt and March, 1988) whereas learning and relearning of routines involve bringing about changes at the level of individual, group and organisational cognitions.

According to Levitt and March (1988) the two mechanisms that result in the change of routines are trial and error experimentation and organizational search. The basis of trial-and-error experimentation is the success rate of an activity in meeting the target and in the search mechanism the best alternatives are selected which becomes the routine. The search for the best alternative is a cognitive activity characterised by processing of information available to the individual and/or the group (Swan, 1995).

In the socio-cognitive approach, routines are socially and cognitively constructed at the individual, group and the organizational levels leading to the emergence of routines of collective nature (Murray and Moses, 2005). Chiva and Alegre (2005) distinguish the cognitive possession perspective and the social process perspective in analyzing the organizational learning and knowledge processes. The former considers acquisition and changes in knowledge brought about and the latter perspective states the importance of situated identities and the knowledge developed in the communities of practice. Based on the opinions of scholars, Reshamn et al, (2009) state that learning and knowledge are based on the aggregate, adaptive, interpretative and social levels of the organization. In further explaining the nature of learning of organizational routines, it can be stated that it involves cognitive, social and

behavioural elements (Reshamn, et al 2009), all of which result in the formation of individual, group and organizational cognitions or what is generally called shared cognitions.

Social-cognitive/learning theory of Bandura (1989) is found to have high potential for explaining organizational processes and the theory identifies the dynamic interplay between the person, the environment and the behaviour as the basis of learning (Gibson, 2004). In his exposition of social-cognitive theory, Bandura (1989) suggests the dynamic causation of behaviour involving triadic determinism. And in this model of reciprocal causation, the three variables that bidirectionally influence each other are the Behaviour, the Person processes of cognition, biology and the other internal events that affect perceptions and actions and the External environment. Reciprocal causation further implies (1) interaction or the mutual influence between thought, affect and action, (2) interaction between personal characteristics and environmental influences (3) and the behavioural influence between behaviour and the environment. The bidirectional influence in the triadic process implies that the functioning of the individual is the outcome of the Person, Behavioural and the Environmental variables.

In the further elaboration of the social-cognitive theory, Bandura (1989) states the significance of symbolic interactionism in which individuals use symbols to process experiences derived from the environment and “symbols serve as the vehicle of thought”(Bandura, 1989). In the use of symbolic interactionism, organizational learning is the process by which individuals develop their knowledge and skills. In the same way direct experiences produce learning, vicarious learning of modelling other individual’s behaviour produce the same learning phenomena of knowledge acquisition and cognitive competencies to enact the behaviour, using the well-known processes of attention, retention, behavioural production and motivation. The cognitive perspective at the group and organisational level emphasises the deliberate and the concerted activity of collecting information, reflecting and processing the information and sharing and distributing the knowledge for better performance (Milway and Saxton, 2011). Pawlowsky (2001) has identified the two approaches of structural also labelled as representationism and corporate epistemology that underlines the interpretation process and the cognitive construction of reality. The structural approach identifies the characteristics of the cognitive structures in the information processing activity, which is further delineated by the cognitive complexity of differentiation and integration. Group and organisational cognitive structures called “composite cause maps”, collective cause maps or organisational mind or organisational schemata or shared

mental models or joint construction of reality, etc., are created in the processes of group and organisational interaction (Schneider and Angelmar, 1990; Pawlowsky, 2001).

Elaborating on the nature of corporate epistemology, Pawlowsky (2001) states that “it considers the interpretation process and the cognitive construction of reality”. Here knowledge creation and development are understood to be one of cooperative interpretation, based upon social interactions. Knowledge resides with the social interaction processes. In the views of organisational social cognitivists and social constructionists, through the process of ‘enactments’, organisations create and modify their own environment through the process of social interaction, reflection and information processing (Burnes, et al, 2003).

In the approach of Honey and Mumford (1986) four individualistic styles of learning in organisations are outlined. Activists are those who prefer to learn by using trial and error method that involves doing and redoing the activity to be learned in an effort to reduce error at each stage. Reflectors are the ones who deliberate, think aloud and ruminate to arrive at the solution or complete the learning process. Theorists prefer structured and systematic way of learning. Abstract thinking using complex ideas are their preferred mode. And finally pragmatists learn using practical and real-life situations where problems are identified and solutions brought forward. Huber (1991) puts forward an approach in which knowledge acquisition, information distribution, information interpretation and organisational memory are the stages of knowledge creation and distribution.

In the well-known cyclical approach of Kolb (1984), the process of learning goes through four stages of concrete experiences, reflective observation, abstract conceptualisation and active experimentation. The SECI model of Nonaka and Takeuchi (1995) identifies the four modes of socialisation, internalisation, combination and externalisation in the knowledge conversion process of tacit and explicit knowledge. In further understanding the development and transformation of individual, group and organisational cognition, it is essential to use the differentiation of knowledge into explicit and tacit (Polanyi, 1960, cited by Nonaka and Takeuchi, 1995). Explicit knowledge is implied in codified, stored or written form. Tacit knowledge, which has a personal quality and which is subjective, cannot be easily and readily objectified or expressed in words. Tacit knowledge involves individual’s feelings beliefs, schemata, paradigms, personal convictions that help one to interpret the world in a tacit way. Tacit and explicit knowledge are found at the individual, the group and the organisational levels. Nelson and Winter (2011, cited by Lazaric, 2011)

suggests an integration of personal knowledge and tacit knowledge in order to bring about the shared understandings and shared knowledge at the organisational level.

The five disciplines of personal mastery, mental models, shared visions, team learning, capacity for systems thinking (Senge, 1994) further open a new path in understanding the mechanisms and processes involved in individual cognition, group cognition and organisational cognition. And Garvin (1993) cites the five skills required in the organisational knowledge creation processes: systematic problem-solving, experimenting with new approaches, learning from own experiences and history, learning from others’ experience and history and transferring knowledge quickly through the organisation. Garvin’s (1993) approach revolves around bringing about changes in the cognitive structures of individuals which is in relation to group experiences and sharing such knowledge in the organisation.

The social constructivist view of knowing is related to a collective dynamic activity, practice and performance (Reshman, et al, 2009). The social perspective of learning lays emphasis on social interactions, communication and politics (Schneider and Angelmar, 1990). The cognitive learning is operationalized in the participative interactional realm, where it becomes group cognitions, which subsequently become organisational cognition in the network perspective. And the network perspective is built upon communication network theories, theories of homophily and proximity, theories of social exchange and social process theory (Skerlavaj, et al. 2010).

Thus learning of organisational routines can be understood from the perspective of cognitive processes and social process, which independently and in an interactional way determine the outcomes of learning of routines. The task of the researcher is to “unpack the organisational black-box in order to better grasp the complexity of organisational routines” (Lazaric, 2011). The unpacking of the black-box thus involves the delineation of the shared cognition mechanisms. Individual cognitions pave the way for collective cognitions. And these group cognitions become the organisational cognitions. Fig. 2 depicts the identified shared cognitions/group cognitions that become the basis of learning of routines. As it will be shown there are differences in the nature of the group cognition mechanisms of learning.

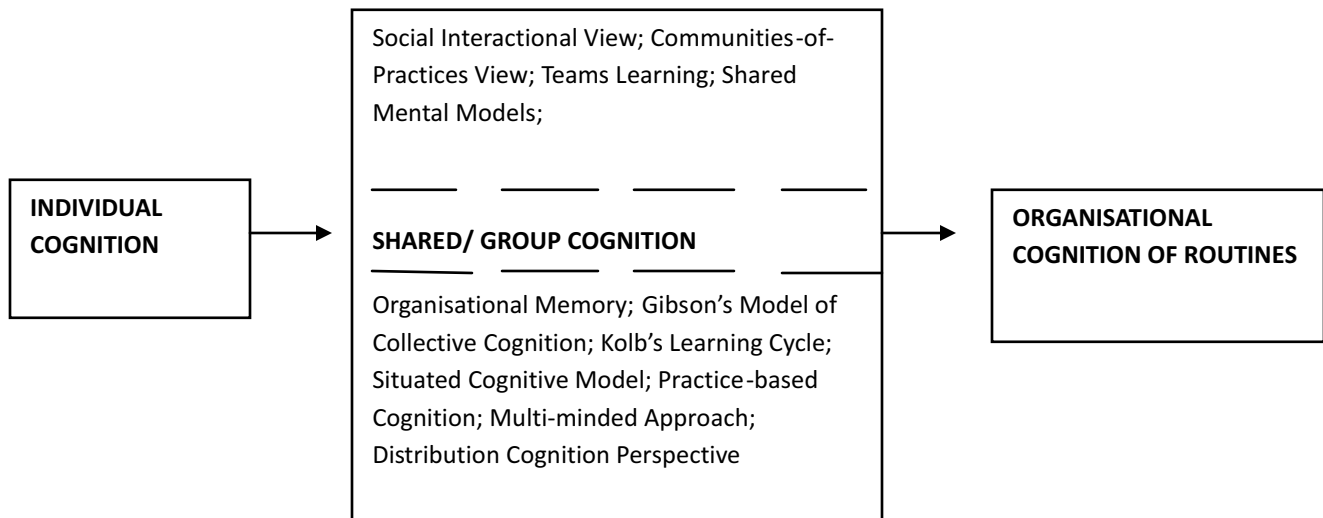


Figure 2: Mechanisms of Shared Cognition

The Mechanisms of Learning: Cognitive - Social - Interactional Views from A Shared Cognition Perspective

The issue to be examined is the movement or transaction and transformation of cognitions among the three levels of individual, group and organisation of organisational behaviour. And the cognitive processes that precede organisational behaviour whether at the individual, group or organisation can be considered as organisational cognition (Hutchins, 1991) since cognition is to be considered in relation to the context (Michel, 2007).

Otherwise construed as group cognition, collective cognition, moving cognitions, distributed cognition or transactive memory, though with subtle differences, shared (sharing of) cognitions is an important research area in organisational learning, managerial/organisational cognition, socialisation and organizational effectiveness which throw light on how internalised cognitive processes become socially shared concepts (Tan and Gallupe, 2006). It is no wonder that the nature of shared cognitions and the way it is conceptualised and the nature of its operations explained differ among researchers (Cannon-Bowers and Salas, 2001). Simpson and Wilson (1999) state that shared cognitions have both commonality and individuality and the former implies the commonly held cognitive structures and the latter implies personal cognitions that are to be shared in the group. From a practical perspective Cannon-Bowers and Salas (2001) further dissect the nature of shared cognition by identifying four connotations to 'shared': two or more team members coming to have some common knowledge, team members holding similar or identical knowledge, team members in a position to have similar expectations for performance and finally team members having adequate coverage of task knowledge. It is clear that from an

organisational effectiveness perspective, the term 'shared' is used with much meaningfulness with reference to task completion or performance effectiveness rather than with the numerical aspect. However shared cognition is to be understood in relation to both task completion/task performance and the number holding similar and dissimilar cognitions.

Different approaches are suggested to explain the way cognitions are evolved in relation to the situation or the social interactional processes and the way it is shared among the members.

Social Interactional View

Social interactions form the basic unit of analysis in the study of group cognitions (Weick and Roberts, 1993; Michel, 2007; Schneider and Angelmar, 1993; Douglas, 1986). The processes and outcomes of social interactions that take on the nature of discussions, debates, presentations, working, moving and feeling together determine the way individual cognitions are transacted and exchanged among the members. And the nature of these interactional activities determines the effectiveness of shared cognitions. The variables that determine the effectiveness of social interaction include commitment, sincerity, trust (Rico, et al. 2009) frequency and the expertise of the members. In social interaction, the meetings of the minds throw open the individual cognitions which eventually become the group cognition.

Social interaction can be further characterised by the patterns of communication and the extent of constructive and collective reflection that takes place in group interactions.

Communication as a major medium of sharing process (Weick and Roberts, 1993) enables the interacting individuals to establish productive cognitions among themselves, thereby setting up a cognitive network marked by information highways. In an approach referred to as multi-minded, the social and the interactional processes are embedded in worker participation, collaboration and integration (Allee, 2003, cited by Jorgensen, 2004). Organisations must ensure the ways and means of the process of sharing information through community, interaction and conversation. Thus learning that operates at the levels of individual, group and the organization (Hurley, 2002) become institutionalized (Hedberg, 1981). Watkins and Marsick's (1993, cited by Yeo, 2006) view of learning identifies the key concepts of shared learning and knowledge co-construction which takes place in the interactional and situational context.

Communities-of-Practice View

Here practitioners can form communities-of-practice (Brown and Duguid, 1991). And that in organizations, groups rather than individuals are the vehicles of learning in a collaborative context. Elaborating on the communities-of-practice view, Brown and Duguid (1991) argue these are significant sites of working, learning and innovating and instead of suggesting a separation between knowledge and practice, they suggest the concept of "learning-in-working". The communities-of-practice approach underlines the social interactive dimensions of situated learning (Roberts, 2006). Communicative activities create interaction and relationships (Yeo, 2006). Panagiotidis and Edwards (2001) contends that organizational power and ideology fixes the personal mastery, mental models, shared vision and team learning which in turn determines the production of organizational knowledge.

According to Wegner (1987) three aspects characterise the communities-of-practice experience: (1) mutual engagement (2) joint enterprise (3) shared repertoire of resources including routines. Communities-of-practice experiences are vibrant centres of learning and innovation where shared learning and heightened exchange of knowledge create the dynamism of collective reification. The key characteristics of communities-of-practice experience as suggested by Wenger (1988, cited by Roberts, 2006) include: sustained mutual relationships, the rapid flow of information, very quick set-up of a problem to be discussed, knowing what others know, what they can do and how they can contribute to the enterprise and shared discourse.

Teams Learning

According to Senge (1994) teams constitute the basic structure of learning in organisations and teams are the ideal settings to

translate knowledge into action through discussion, reflection sharing, feedback and interaction (Hedlund and Osterberg, 2013). Team learning is characterised by conversational and collective thinking skills resulting in strategic effects (Senge, 1994). Collective and collaborative minds facilitate shared knowledge and understandings (Murray and Moses, 2005) so that there is an interaction between theories-in-use and espoused theories (Argyris, 1982).

Hedlund and Osterberg (2013) based on the research of other scholars have codified the different types of team learning as: exploitation and exploration, first-order and second order learning, single and double loop learning, learning I and learning II and incremental and radical learning (March, 1991; Lantieri and Mezias, 1992; Argyris, 1982; Bateson, 1972; Miner and Mezias, 1996, all cited by Hedlund and Osterberg, 2013). These are intended to learn and improve the existing routines and capabilities and the acquisition of new problem solving skills. Interpersonal interactions (Klein, et al. 2009) and socio-cognitive processes are to be taken into account in determining the efficiency and effectiveness of team learning such that there develops mutually shared cognition (Van den Bossche et al. 2006), reflective and collective thinking, serious discussion and feedback and greater interpretation and intuition (Murray and Moses, 2005).

Learning in teams is dependent upon its relations with the external environment and the way it coordinates member, team and task characteristics (Nieva, et al. 1978). It has been shown that acquainted team members show greater cooperation and team performance (Costa, et al. 2009). Trust among team members enhances the effectiveness and predictability of task-related communications (Rico, et al. 2009). And that disclosure of internal frames of reference improves group members' working relationships with one another that result in bonding relationships (Mitchell, 1986). Team learning that takes place in the social interactional processes results in the development and sharing of collective knowledge. Such knowledge emerges from the congruent relations, shared internal frames of reference and ideas and a climate of trust and cooperation.

Shared Mental Models

Initially conceptualised by Johnson-Laird (1983), mental model is interpreted as an internal cognitive representation or simplification of a physical reality (Spicer, 1998). Kim (1993) characterise a mental model as consisting of two types of knowledge: conceptual (know-why) and operational (know-how). Mental model can also be considered as an internal representation of the action plan or the direction in which the behaviour is to take course. Mental model enable people to make inferences and predictions and to interpret the

phenomena (Johnson-Laird, 1983). The notion of a shared mental model was introduced by Cannon-Bowers and Salas (1990). Klimoski and Muhammad (1994) used the understanding of individual sense-making to conceptualise cognition at the team level. Shared mental models thus represent the interacting mental representation of team members. Shared mental models contain representations about routines of all forms.

Mathieu, et al. (2000) identified four types of mental models (1) technology, equipment model relating to equipment functioning, operating procedures, (2) job/task model relating task procedures, likely contingencies, likely job scenarios, task strategies, environmental constraints and task component relationships, (3) Team interaction model relating responsibilities, information sources, interaction patterns, communication channels, role interdependencies and information flow, (4) Team model relating team mate's knowledge-team mate's skills, team mates attitudes, team mate's preferences and team mate's tendencies. Van den Bossche et al. (2011) suggests the ways and means of building a shared mental model. The three related processes involved are construction, co-construction and constructive conflict. The construction of meaning stage revolves around gaining understanding about the problem or task at hand by participating in the group interaction process. The process of co-construction or collaborative construction is a "mutual process of building meaning by refining, building on or modifying the original offer" (Van den Bossche, et al.2011) and there emerges new meanings. Shared mental models come into existence in the event of agreement with the co-constructed meanings. Otherwise there may ensue a stage of constructive conflict where there is an open-ended view of diverse views. And through the process of negotiation and clarification a convergence of meaning is achieved (Van den Bossche, et al. 2011).

Organisational Memory

Organisations function depending upon the memory "that reside within the net sum of an organisation's employees" (Sparrow, 1999), their experiences of events, recorded information pertaining to jobs/tasks, technology, people and structure. Wegner (1987) developed the concept of transactive memory, which states that memory is present in the interactions of group members and the members effectively utilise it for task performance and completion. Organisational memory is constituted of networked memory of individual members with distributed knowledge of who knows what (Wegner, 1987). Through specific encoding and allocation processes, there emerge specialists of memory in different areas of organisational functioning and the differentiated memory of individuals become useful to the group (Mohammed and Dumville, 2001). According to Wegner (1987) transactive memory develops through the processes of encoding, storing and retrieval. Members encode information depending upon their domain of expertise or the incoming information is encoded with a label so that it can be coded to an expertise domain. Encoded and stored information is retrieved when required using the label attached to different individuals. Thus group/organisational memory work like a networked computer in which different participants can access information by knowing the domain of expertise. Moreover given the distribution of roles, expertise, experience and areas of interest, it is easy to transact in the group.

Drawing upon the types of shared mental models suggested by Mathieu et al. (2000), the following group memory can be stated to be relevant in learning and execution of different patterns of collective routines. And such memories are explicated in outlines, Table 1.

Table 1: Different types of organisational memory

Type of Memory	Memory Content
Technology/Equipment	Equipment functioning; Operating procedures; Maintenance and repair
Job/task	Task procedures; Task strategies; Task component relationships
Individual -specific	Domain of expertise; Source of what; Availability; Personal details.
Location-specific	Availability of materials
Company-specific	Company-related information; General and key aspects of the company; its function and levels

Gibson's Model of Collective Cognition

Gibson's model (2001) is based on the view that groups are information processing entities (Hinsz, et al.1997, cited by Gibson, 2001) and that to understand the process of collective cognition, "mind" is to be "located" in the interactional processes and connections among the members (Weick and Roberts, 1993). Gibson (2001) based on the research in the areas of information processing, group development and communication has identified four phases in the development of collective cognition: accumulation, interaction, examination and accommodation.

In the phase of accumulation, group members perceive information and the significant and the relevant information is stored in the group mind with a label. The stored information with a label will be used as and when required, that is any member can initiate a discussion on the stored information so that further refinements take place. In the interactional phase of retrieving, exchanging and structuring, the transactive memory systems come into operation. The dispersed and the integrated individual memory systems in the communicative interaction process become a supraordinate memory that the inter-linked individual memory systems become a source for all activities of the organisation. In the communicative interactions, the information is retrieved, exchanged and structured with greater meaning and elaboration. In the examination phase, members go through a process of negotiation, interpretation and evaluation. Through the process of critical reflection and engagement with the information, a crystallisation of information takes place.

And in the final phase of accommodation, crystallised information from different realms become integrated, following which decisions and actions are taken. The cognitive integration achieved results in emergent knowledge bringing about learning outcomes at the behavioural level of group/organisation.

Kolb's Learning Cycle

The well-known learning cycle of Kolb (1984) involves the four stages of concrete experience, reflective observation, abstract conceptualisation and active experimentation. In the conceptualisation of routines that involve cognitive regularities (Becker, 2005), these stages of learning hold good in that individuals and groups go through these processes in explicit and implicit manner.

Learning starts with encountering a concrete experience of working or enacting a specific routine or it can also be in the

indirect form of an observation that leads to the stage of reflective observation. In reflective observation, the individual aligns the self with the enactment of routine. The feelings, emotions and the dispositions are to be attuned to the task. In the third stage of abstract conceptualisation the formation of cognitive schemata or knowledge structures pertaining to the task takes place in the internal representation of the task, which becomes the basis of cognitive regularities. And in the fourth stage of active experimentation, the cognitively embedded routines are enacted by the individual which may or may not be modified in another cycle of learning. Moreover, this model is especially applicable in the learning-by-doing strategy where individual frequently resorts to trial or experimentation and redoing (Levitt and March, 1988). And the establishment of recurrent interaction patterns of motor acts is not without the accompanying cognitive changes.

A Situated Cognition Model

In social learning theory, learning takes place in the situated context of organizational processes and the learning of routines is effected in a context that is historically, culturally and intelligently produced (Elkjaer, 2005; Levitt and March, 1988). Proponents of situated cognition (for e.g. Lave and Wenger, 1991; Cook and Brown, 1999; Lant, 2002; all cited by Elsbach, et al. 2005) state that cognition is the outcome of the interaction of the perceiver's mind (schema) and the environment (context) (Elsbach, et al.2005). In a situated or contextualised model, schemata, espoused and/or the enacted are the base of the routine. Routines are linked to schemata of espoused and enacted type (Rerup and Feldman, 2011). Espoused schemata, which are espoused by leaders/mangers, are "initial schema" in novel situations and enacted schemata are implied in actions that reveal a "pattern of realised cognition and action" (Rerup and Feldman, 2011).

The generation of ongoing cognitive processes are to be understood in relation to the specific contexts of their origin and these processes cannot be studied as isolated abstractions (Michel, 2007). The so-called situated cognitions are the products of the interaction of cognitions and the given situation (Elsbach et al, 2005). Cognitions are generated, modified, maintained and deleted in relation to the environment situation that can be physical, work-related, technological, social, psychological and other significant aspects. As the contexts change, the cognitions also change (Resnick, et al, 1997). The process of cognition-situation interaction is termed attunement (Michel, 2007) and it is the process of attuning the cognition to the relevant situational resources that produce situated cognitions and situated cognitions are produced in the generation of schemata.

Thus learning of routines are the outcomes of the interaction between schemata and organisational context, Fig.3. Event schemata refer to the way an unfolding of an event is conceptualised by the person (Elsbach, et al.2005). Self-schemata denote the individual's own identities and personality perceptions.

Role schemata mean the knowledge about the individual's structural position and the expectation of others. Rule schemata refer to the understandings about the way the key variables are related (Elsbach, et al.2005). The contextualised approach studies cognition in relation to the historical, physical, social, technological, cultural, structural and work context. Here "the person and the social context are seen as constituting one another" (Markus, et al.1996).

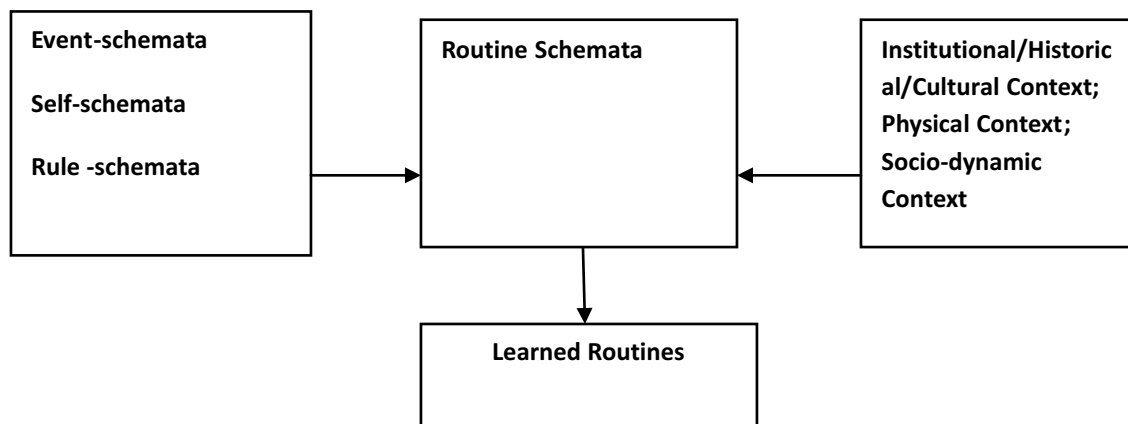


Figure 3: Situated Schemata-Routine Model

Practice-Based Cognitions

Practice-based cognitions are situated within specific task-related context and the bases of such cognitions are the practice contexts. The strength of the practice-based approach is that they strive to offer a holistic understanding of knowing and learning as dynamic, emergent social accomplishments. Gherardi (2001, cited by Marshall, 2007) in his view state that "when the locus of knowledge and learning is situated in practice, the focus moves to a social theory of action that addresses activity and passivity, the cognitive and the emotional, mental and sensory perception as bits and pieces of the social construction of knowledge and of the social worlds in which practices assume meaning and facility".

A Multi-minded Approach

The individual organisational cognitions are the individual cognitive structures and processes which are generated within the individual in relation to the organization and these cognitions are related to the individual's behaviour in the organisation.

Group cognitions, which are held by the members of a group, have the nature of commonality and similarity. In practice they are the cognitions that bring together a group of members and it enables them to perform and complete the task. Intragroup cognitions are shared by a group/team and intergroup

cognitions are shared by more than one group. Organisational cognitions are shared by the members of all departments or levels of the organisation and these are in the nature of organisational objectives, common practices or rules or norms or general behaviour in the organisation.

According to Chiva and Alegre (2005) organizational learning has mainly adopted the two strands of research, that is, one based on cognitive individual learning processes and the other social that emphasises the relational aspects of learning. And they have suggested the need for a psycho-social view that integrates the psychological (individual) and social (organisational) processes. The integration and the interconnections of the individual and organisational processes are shown in the Fig.4. In this multi-minded view knowledge is to have a socially robust quality that emphasizes participation, interaction, integration and networked relationships (Jorgensen, 2004).

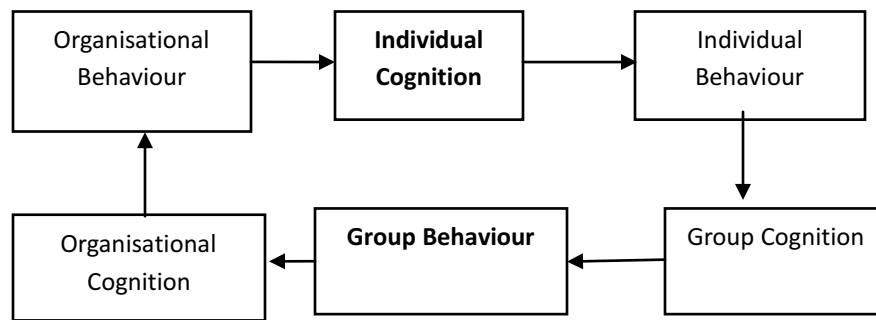


Figure 4: A Multi-Minded Model

Individual cognitions can be studied from the perspective of analysing the cognitive schemata. Schemata are cognitive structures of knowledge representing the way the world operates and that abstracted knowledge about objects, events and persons are stored in schematic memory (Fiske, 2000). Schemas are self-generated or directly learned from others, known as second-hand schemas. The important point about schemata is that they undergo change confronted with contradictory or disconfirming information. Schemata are acquired in new learning experiences or the existing ones are modified in the light of new information. Expansion and elaboration of schema is thus contingent on the incorporation of new information, a process Bartunek and Moch (1987) labelled as “first-order” change. And “the second-order” change, which is more fundamental takes place in the event of confronting contradictory information. Taylor and Crocker (198, cited by Harris, 1994), list out the seven functions of schemata as (1) providing a structure against which experience is compared (2) information encoding and retrieval from memory (3) quickened and efficient information processing (4) filling of knowledge gaps, (5) supply templates for problem-solving (6) facilitate the anticipations of the future, goal setting, planning and goal execution (7) evaluation and judgement of experiences. The characteristics mentioned corroborate the fact that schemata and schematic change form the cognitive basis of routinised behaviour. Schema enable easy enactment of say ostensive and performative routines (Rerup and Feldman, 2011) and structural and functional routine as without the corresponding schemata, individual’s performance of routine would be maladaptive and inappropriate. In other words Rerup and Feldman (2011) have empirically shown the “co-evolutionary complexity “between schemata and organisational routines. Schemata trigger routines.

Group cognition that results from intragroup interactions and communication is a form of information processing based upon acquisition, retention, transmission, modifications and use of information shared among the members (Gibson, 2001). What is important about group cognition is that the development and emergence of dyadic and collective cognition is contingent

upon the frequency of interactions that run through the networked group processes. Gibson (2001) has delineated certain processes by which individual cognition gets transformed into collective cognition or that becomes the collective thinking of the people. According to Gibson (2001) high task uncertainty throws the group into a deliberative interactional mode that result in spinning of new cognitions. Members resort to heightened retrieval and exchange of information and the interconnectedness established in the networked information bring about a metamorphosis giving rise to the emergence of higher level and advanced neo-cognitions.

The second catalyst that results in the emergence of neo-cognitions is the perceived role ambiguity in the group. The third catalyst revolves around the conflict in groups. And finally according to Gibson (2001), the greater the perceived discrepancy between the in-group and the out-group, the greater the level of activities churned out in order to achieve a favourable comparison with the other group. The development of group/ collective cognition implies mechanism of shared or distributed cognitions. Hedberg (1981) further explicates the concept point to the existence and use of cognitive systems and memories which are active in the organisational processes. The individual mental activity becomes the collective mental activity and this is achieved through communication, storage and integration process (Klimeck, et al. 1994, cited by Hurley, 2002). According to Kim (1993) shared cognitions lead to the development of organisational cognitions. That is organisational cognitions develop as mental models are actively shared and this become the structure or the architecture of organisational cognition leading to enhanced coordinated action and the routinisation of behaviour of overt and covert forms. The institutionalisation of collective cognitions at the organisational level changes the status of group cognitions to organisational cognitions (Crossan, et al. 1999) which becomes fundamental to the enactment of organisational routines.

Distributed Cognition Perspective

Distributed cognition approach suggests the cooperation and interaction of internal representations (individual cognitive processes) and external representations (tools and artefacts of information processing). The implication of this approach “entails going into the workplace and spending time determining and analysing the problems with the existing technology and work practices and then suggesting recommendations as to what needs to be preserved and what systems and work practices need to be redesigned to support and improve the collaboration and coordination of work activities” (Rogers and Ellis, 1994). The unit of analysis in a distributed cognition approach is a cognitive system composed of individuals and the artefacts and tools used. The structure implies the representations inside and outside the head and the point is that cooperation/interaction between the people and the artefacts makes distributed cognition possible (Nardi, 1996).

Cognitive processes are found within the heads of the individuals and in the interactions of individual heads. Thus cognitive processes are distributed among the members of an interactional group and cognitive processes involve the coordination and cooperation between internal representations and external representations of tools and artefacts or what is called media. The cognitive system or the functional system in a distributed cognition approach is constituted by the collection of individuals and artefacts in their relationships to each other. In the distributed cognition perspective, routinization is brought about in the intersection of tools and artefacts and internal representations of individual and groups. The coordinated nature of distributed structures are revealed with reference to the environment, the representational media of internal cognitions of individuals and external representations of tools and artefacts of learning, interactions of individuals with each other and their interactional use of tools and artefacts (Rogers and Ellis, 1994). The cognitive activity of routines is thus constructed from the internal representations and the external representations (Hollan, et al. 2000). The mechanisms of learning of routines suggested revolve around the two broad perspectives of acquisition of knowledge and sharing of cognitions in the interactional processes. The overlapping relations that exist among the approaches are evident. What is required in this scenario is to integrate the cognitive processes with the social-relational processes so that there is collective-cognitive learning. And in this collective-cognitive learning individual, group and organisational cognitions are generated and regenerated in the social, interactional and situated processes (Rerup and Feldman, 2011; Elsbach, et al. 2005).

Conclusion

The centrality and the complexity of the organisational learning of routines is revealed in the multilevels of situated cognitions. In the dynamic conceptualization, learning of routine goes through a process of individual, group and organizational learning, characterised by high cognitive operations, initiated, shared and distributed in the interactional social settings. The ‘unpacking of the organisational black-box’ involves unravelling the cognitive operations and delineating the networked, collective and interactional systems of cognitions.

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