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Organizational Routines and Innovation: Micro and Macro Antecedents

ABSTRACT

This paper explores the ambiguous nature of organizational routines in regard to generating innovation or innovation routine. Considering the dual character of routine, we conceptualize that routines have inherently a potential to drive changes, therefore, organizational routines should be considered as a trigger of innovation. In order to exploit organizational routines as a vehicle for innovation, managers should be aware that micro and macro level factors influence the dynamics of routines. Hence, to design proper organizational settings managers should learn about the mechanisms activating learning processes as essential for new knowledge generation as well as for novelty generation through organization built on a routine system.

Keywords: organizational routines, change, stability, innovation routine, micro and macro antecedents
JEL Classification Codes: L22, L25

1. Introduction

Innovation has highlighted as a core competence for contemporary organizations to maintain or enhance effectiveness in rapidly changing and challenging environments. The need of organizations to systematically stay innovative is at the centre of innovation research [Tushman and Anderson, 2004] and strategy research [Eisenhardt and Martin, 2000]

To understand challenges such as innovation across micro and macro levels of analysis, it is necessary to break theoretical entities such as routines and capabilities into their component elements [Salvato and Rerup, 2011].

Generally, routines have been defined as complex processes that extensively depend on existing knowledge, simple performance, and repetition to produce expectable results at different organizational levels [Eisenhardt and Martin, 2000; Cohen et al., 2005]. In line with this interpretation, we could regard routines as the main element of capabilities, which in turn have been observed as being intentionally developed and deliberately expanded to support firm-level outcomes [Dosi et al., 2000].

This conceptualization of routines and capabilities has narrowed efforts to understand the internal dynamics of these constructs. In contrast, research that studies routines and capabilities more intensely proposes that understanding at one level of analysis can produce data for conceptualizing at other levels [Feldman, 2000; Felin et al., 2009; Gavetti, 2005; Howard-Grenville, 2005; Zbaracki and Bergen, 2010]. This paper, as typically in a bulk of research, relies on conceptualizations that highlight the collective nature of routines and capabilities. This accent has moved efforts to look into micro and macro understandings of routines and capabilities. Consequently, we intent that to generate new insights about routines and capabilities, especially to understand its relation to innovation it is useful to analyse routines dynamics from the micro and macro level perspectives. Accordingly, this is the main goal of the paper. Exploiting the knowledge concerning micro and macro antecedents of routines and capabilities and interrelationships across levels of analysis, we can assume how innovation routine may come into being. Furthermore, we argue routines are the source of organizational dynamics and novelty. The assumption made in this paper bases on up to date literature, stressing that routines arise at the group level [Cohen et al., 2005; Dosi et al., 2000]. This turns our attention to explaining how teams in organisations can enable or hinder innovation, which originates and has been subsequently diverted by a team into routine performance. Although the documented importance of innovation and the upscale research has concentrated on it, organizational routines have received comparatively less attention than other antecedents have, according to up to date research. For teams to generate innovation, team members need to produce novel ideas and must critically process them to remove those ideas that look impractical and implement those promising. The construct of routines that stresses their organizational, rather than individual, nature, is important to see stability, flexibility, and change in organization and therefore, the potential to generate innovation.

The paper is structured as follows. The first section presents the dual character of organisational routines. In the next section there is a discussion concerning the relationships between organisational routines and innovation. As the result of the presented argumentation, innovation routines' construct is defined. Finally, in the summary section there is a discussion of the presented issues and the directions of the future research in this area are described.

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2. Ambiguous nature of organizational routine

Environment dynamics influence a firm's need to adapt its capabilities perpetually and to create innovations continuously. Therefore, management practice asserts continuous change and the creation of significant innovations. The concept of "creative destruction" based on rule-breaking innovations is one described by Schumpeter [Schumpeter, 1934]. Anyway, Schumpeter often reverted to how the concept of routines might grasp novelty.

Furthermore, the neo-Schumpeterian theory of the firm entails an issue of changes in routines that indicates three relatively different kinds of changes [Becker et al., 2006]: (1) incremental changes in existing routines using experience; (2) inter-firm and intra-firm diffusion of routines; and (3) endogenous generation of new, idiosyncratically novel routines. The incremental change of routines seems to have sound support by the theory of experiential learning [Levitt and March, 1988]. Some of the significant attributes of experiential learning have been identified in the research [Gavetti and Levinthal, 2000; Denrell, 2005]. To make it precise, it is widely accepted that experiential learning is narrow-minded [Levinthal and March, 1993] and is vulnerable to inaccuracies attributable both to human biases and to the conflicts within an organization [Denrell, 2005].

The diffusion of routines (differential adoption of new routines [Becker, 2008]] looks practically well known within sociology. Some of the important attributes of the diffusion of routines have also been researched and presented in research studies [Radwan and Kinder, 2013]. As a rule, it is obvious that a theory of the diffusion of routines uses two common assumptions —the assumption of reproductive reliability and the assumption of network exogeneity [Miner and March, 2002]. Diffusion research explains some aspects in the way the incremental diffusion of routines from time to time leads to the widespread adoption and outstanding determination in routines [Nelson et al., 2004]. Researching the existent diffusion of more complex routines is a challenge, but some research has discovered how it can materialise [Winter and Szulanski, 2001]. However, researching the existent diffusion and altering the adoption of routines is only part of the conundrum.

What is relatively missing is a theory of the endogenous creation of idiosyncratically novel routines. For researchers the problem fixes in finding the mechanism of generating new

routines. In the context it is Winter's most important findings concerning two such mechanisms: first, the combinations of routines and second, the unreliability of routine replication.

Besides the presented research findings, to a certain degree there are linkages between change and innovation and the change of a firm's existing way of operation. Hence, routines and primary rule systems seem to be the object of intended change intends. As is noticeable in plenty of research, innovation has been emphasised as a core competence for each organization to sustain or increase its effectiveness in changing environments.

We could notice that the effort to use the Darwinian explanations in management research which is exploited to explain evolution in management is still considerable. Darwin used the term adaptation for explaining the process of searching for the most suitable fit into the external environment. This fit eventually happens because of the entity's existing or acquired resources and/or capabilities. The ability to adapt to a changing and dynamic environment is essential for the organizational survival characterized by routine. Routines certainly play an important role in organizational behaviour. Hence, the evolutivity of organizational routines explained by their propensity to adapt and evolve is a vital concern.

The evolutivity of organizational routines is an important issue for both theorists and practitioners. Research indicates four dimensions to characterize the routines and assess their evolution potential, namely interdependence, reflexivity, temporality and regulations. Additionally, the threefold nature of routines emphasizes it as behavioural, cognitive and material [David and Rowe, 2013].

Organizational routines have been explored extensively to discover their nature and their impact on organizational performance. Following the literature review, we can identify three streams of researching organizational routines [Güttel, 2006]. There are (1) traditional understanding of routines [Cyert and March, 1963], (2) evolutionary understanding of routines [Nelson and Winter, 1982], and (3) practise–based understanding of routines [Feldman and Pentland, 2003]. The first stream of researching routines stresses stability, the second looks at the evolution and change of organizational capabilities, and the last one explains routines as a process.

The fourth stream based on rules is worth adding in this vein of research, however, D. Geiger and A. Schröder propose the rule-based routines approach exposing the interplay between contra-factual stability and change [Geiger and Schröder, 2014]. The rule-based model of organizational routines elucidates the predominantly organizational nature of routines and their relation to the performing individuals. Moreover, the concept ascertains routine dynamics by identifying three different modes of how organizations may respond to a destruction of their rules: not changing the routine; reflexive, double-loop learning; and an evolutionary drift of routines. In addition, they claim that it is the subtle relation between rule-following and rule-breaking that determines the dynamics of routines.

Reviewing the routines literature up to now has exposed that most studies denote that organizational routines have the effect of stability and continuous adaptation. Routines are also considered as an important part of capabilities, so influencing firm-level performance

[Dosi et al., 2000]. Some researchers see routines as the most fundamental unit and building block of organizational capabilities [Winter, 2003]. In Table 1 we can find a major contrast between the capabilities and practice perspective to illuminate similarities and discrepancies.

Table 1. Assumptions of the capabilities and practice perspectives

	Capabilities Perspective	Practice Perspective
Main interests	What routines do (coordinate, create, change) and how they lead to firms' performance	How routines operate; internal dynamics
Focal level of analysis	Firms (the firm is the structure for governing, collecting, creating and maintaining routines)	Routine itself
Unit of analysis	Routines as "entities" (whole routines, "black boxes")	Routines as "parts" (internal structure of routine, what is inside the "black box")
Empirical attention	Firm-specificity of routines How they create value and thus lead to differential performance How they build to form capabilities Complementarities between routines Transferability within and between firms (tacitness and stickiness)	Actors' influence on routine performance Artefacts' influence on routine performance How routines change and remain stable over time; role of agency and artefacts in this process How routines are created or changed When and how routines break down
Behavioural assumptions	Bounded rationality Organization-specific foresight Potential self-interest Agents act as expected	Human action is "effortful" (not mindless) Human agency/everyday activity constitutes social life Agents are not replaceable; have different intentions, motivations, and understandings
Analogies	Genes Repository of memory Microfoundations of capabilities	Grammars Repertoires Generative systems
Stability and change	Acknowledge that routines can change, but get more interested in stability Routines provide for stability or change	Change and stability always possible Same mechanisms (agency, artefacts) underlie change or stability

Source: Parmigiani and Howard-Grenville, 2011.

Routine stability is a pattern of the traditional understanding of routines [Nelson and Winter, 1982] and it is challenged by recent research. Up to date findings discover remarkably that routines can change, not just due to the external (exogenous) need for change [Gersick and Hackman, 1990] but even without such a necessity, as individuals participating in routines can and do change routines endogenously [Feldman and Pentland, 2003] [Rerup and Feldman, 2011].

This, today the dominant practice-based understanding of organizational routines developed by [Feldman, 2000] and [Feldman and Pentland, 2003] uses essential discernments explaining the dynamics of routines.. This practice-based concept grasps routines as continuously changing units. Routines in the practise–based view are explained through the individuals participating in the routine who constantly change the given routine in the continuous process. Nevertheless, we can find arguments stating that organizational routines are not ever-changing but are constructed on stable rules. However, the understanding of the changing nature of routines is central in research relating to creativity and innovation within organizations [Breslin, 2011].

3. Endo- and exo-antecedents of innovation through organizational routines

Research argues that if we accept that routines are the source of continuous change in organizations [Feldman, 2000], then the main difference in organizational analysis between micro and macro change seems to be diminished. Furthermore, organisational routines-conceptualisations emphasise collective actions that can be observable in organisational routines. Nevertheless, the latest research has pointed out that the organizational context within which routines are embedded is vital for the understanding the performance and change of routines [Parmigiani and Howard-Grenville, 2011]. In addition, we assume important differences between formal and informal structures, such as organizational culture or political games, which helps and supports the understanding of organizational occurrences, and there is a need for incorporating it into the conceptualization of organizational routines.

Consequently, we should look parallelly at team members' characteristics as an exemplification of collective actions and at team context as an organizational one to understand routines dynamics. Hence, there could be identified at least two levels of routines analysis. These levels have been associated with endogenous and exogenous elements or micro and macro antecedents of routines variance.

The endogenous and exogenous nature of the aspects of the variation of routine is a permanent challenge [David and Rowe, 2013].

The valuable concept of aforementioned routines evolutivity has been proposed, among others, by [David and Rowe, 2013]. Endogenous evolutivity explains the propensity of a routine to evolve over time. Exogenous evolutivity, on the contrary, is the capacity to adjust straightforwardly to the environment. Characterizing and understanding these two arrangements of evolutivity is an important aspect of explaining the process of routines dynamics. Moreover, it is especially vital to understand variation in routine.

The general conceptualization of routine evolutivity/dynamics/change concerning micro (exogenous) and macro (endogenous) elements is presented in Fig.1.

The conceptualization is simple and straightforward but explanations are much more complex and challenging.

Turning attention to macro factors, first, we have to look at some essential features of organizational context because, yet not adequately, it has been reflected in depth in the context of business firms. Secondly, top-down management intervention is an important factor of the exogenous impact on routines and change of routines [Becker et al., 2005]. Managers, therefore, are treated as a source of exogenous change in organizational routines.

Figure 1. General conceptualization of routine evolutivity
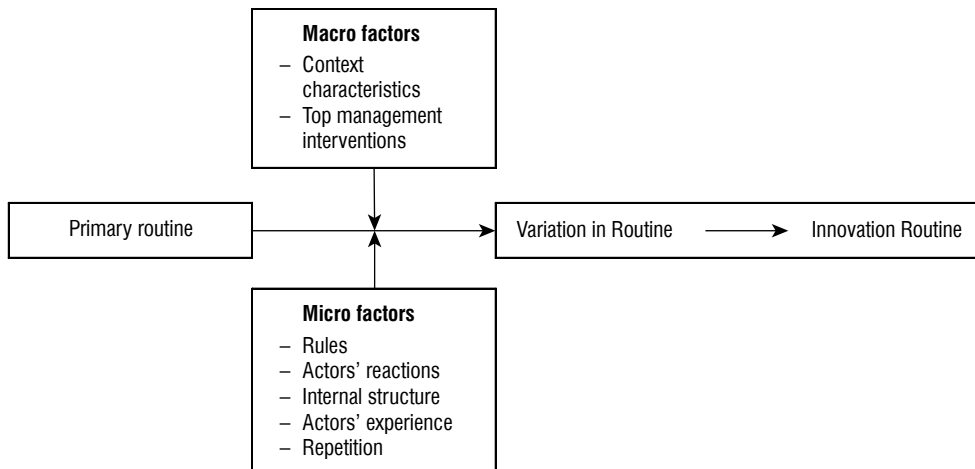
Source: the author's elaboration.

It is important to notice there are some frameworks of routines exposing their organizational rather than individual character. This kind of assumption makes it possible to deepen the knowledge on routine stability, flexibility, and change. Considering, for instance, Geiger and Schröder's framework, it is possible to differentiate between routines and rules and on that basis identify four significant attributes of rules [Geiger and Schröder, 2014]. Firstly, a rule represents a normative behavioural expectation. Secondly, rules remain in place even if they fail. Thirdly, rules involve sanctioning power; and fourthly, rules are to some extent general in nature, and thus, basically, rules cannot be used directly. Consequently, rules authorize a fluctuating space for interpretation.

Following this argumentation, organizational routines contain rules as their basic constituents. Organisational routines entail the interpretation of rules in the organisational context and identifiable performance arrangement. This rule-based model of organizational routines elucidates the primarily organizational nature of routines and their relation to the actors participating in the routines. Moreover, the model shows routine dynamics by exposing three different options of how organizations may react to a destruction of their rules. An organization may react intentionally not changing the routine; it may initiate a process of reflexive, double-loop learning aiming at change in the rules; and finally it may focus on an evolutionary drift of routines. Consequently, we are able to recognise the dynamics of routines existing because of the elusive relation between rule following and rule breaking.

In addition, research has acknowledged instruments by which actors participating in routine can generate endogenous change. For instance, [Feldman, 2000] claims that when results of action fall little of models not producing the intended results, actors reflect on and react to those results by making effort to change or restore routines to achieve these models or by developing them to exploit new possibilities. Furthermore, [Feldman and Pentland, 2003] find instruments of guiding, referring, and accounting by which the participants in routines

can create variations that other participants recognize as reasonable. Routines thus change endogenously as actors react to the results of previous repetitions of a routine or retain changes announced by other actors participating in a routine [Feldman, 2000; Feldman and Pentland, 2003; Pentland et al., 2012]. Consequently, one routine can produce many different patterns [Pentland et al., 2011; Turner and Rindova, 2012] and outcomes as well. In addition, this process is natural.

Routines are sensitive to endogenous change because they are generative systems with an internal structure. The basis of endogenous change in routines is to involve the actors participating in routine in the investigation of routines, namely the actors who complete the routines and who should be the most salient driver of endogenous change [Pentland et al., 2011; Feldman and Pentland, 2003].

A significant conclusion of the earlier literature is that the actors participating in a routine and making decisions concerning how and when to perform tasks typically also have some control over the task, simply because of delegation that implies decision [Aghion and Tirole, 1997].

Actors continuously change the way they act. Therefore, performance models of a routine and each new performance gives possibilities of uncovering new aspects of the routine; thus, continuous change is the consistent result [Becker et al., 2006; Becker et al., 2005].

Following the previous argumentation, we can claim that in the system based on a routine novelty can arise endogenously. Prior findings show that the rule-followers only adapt to changing conditions when managers find new combinations and make effort to push them through.

Hence, here arises the next important issue in the vein of routine based system that is novelty. The literature suggests some primary mechanisms are principal to successful innovation. One mechanism is the activation of relevant capabilities [Katila et al., 2008].

Felin and Foss [2011] offer some relevant deliberations of the organizational routines and capabilities literature. Following their considerations, the most universal and common antecedents and mechanisms of organizational routines and capabilities are experience and repetition. The results of revisiting the literature is that repetition and experience have endogenous roots and can only offer a fractional, and thus incomplete, understanding of organizational capability and behaviour. Furthermore, Felin and Foss discuss five endogeneity-related problems connected with identifying repetition and experience as the key antecedent and mechanism of organizational routines and capabilities. These problems are: (1) the problem of origins and causation; (2) the problem of new knowledge; (3) the problem of extremes; (4) the problem of intentionality; and (5) the problem of the environment.

A relatively recent interpretation of routines and capabilities has some associations to the research on routines as 'dispositions' [Becker et al., 2005; Hodgson, 2003; Hodgson, 2004; Hodgson and Knudsen, 2004]. Dispositions as defined are 'stored behavioural capacities or capabilities [that] involve knowledge and memory' [Howard-Grenville, 2005]. Definitely, dispositions advocate an internal propensity and capability for specified ways of action. Figure 2 presents change and stability in the light of routines and capabilities.

Figure 2. Capabilities for change and stability

The organisation's change and stability	
Dynamic aspects	Perpetuation aspects
Transformation routines (Second order dynamic capabilities)	Generative routines (Second order perpetuation capabilities)
"rule-based"change of the organisation's change behaviour	Define the corridor of acceptable "drift"of change routines
Change routines (First order dynamic capabilities)	Defence routines (First order perpetuation capabilities)
"rule-based"change of innovation and operational routines	defines the corridor of acceptable "drift" of innovation of operational routines
Innovation routines Operational routines (Zero level capabilities)	

Source: Güttel, 2006.

Summing up, routines are inherently generative [Howard-Grenville, 2005] and are the source of continuous change. There is even a worth considering concept of ongoing endogenous change in routines developed by Feldman [2000].

If a concept of routine unambiguously relates to novelty or even innovation, it raises the question regarding innovation routine. In the literature, in the research concerning routine based system there is very limited focus on this issue. Innovation routines are routines established through organisations in order to generate and implement innovations regarding new products and services in existing or new markets or to address current business activities to new markets. Hence, the development of innovation mostly based on routines as well [Güttel, 2006]. However, not every change in routine provides innovation.

4. Summary

To conclude, this paper discusses routine change and dynamics by demonstrating obvious routine instability. Routine instability can be attributed to many micro/endo and macro/exo mechanisms and it is the task of organization managers, especially team leaders to identify those and consider appropriate interventions. This may include the acceptance of instability at some level but may also require simple actions to limit routine dynamics.

Organizational routines, which indicate a vehicle, fixed or almost instinctive action and behaviour, break an organizational inertia down in changing novel conditions. On the one hand, routines reinforce the status quo and on the other, inhibit active searching for alternatives. In this concern, unlearning makes the change and learning process permanent, because a new set knowledge modifies and replaces previous behaviours and routines.

One more issue is that planned innovation can be seen as a starting point for organizational routine change, which can change the interaction between the work settings and actors. We

find that interdependency between micro and macro factors, which can lead to the articulation of existing knowledge and to the generation of new knowledge about how to perform a task. Hence, new interrelations can lead to new or changed organizational routines. It has important practical implications, and involves an investigation into the nature of organising/strategising. Nevertheless, the question remains how to conceptualise the relationship between organisational stability and organisational change, between routines and innovation, because routines are not isolated phenomena. In this aspect, the question concerning the nature of routines is closely related to the question of the relationship between stability and change in the organization. Furthermore, the routine approach gives a comprehensive understanding of the construct of organizational routine in generating novelty and innovation.

Managerial implications can be drawn from our study revealing several insights that can be used by practitioners to develop and strengthen innovativeness through organizational routines. This paper has highlighted the importance of the mutual effect of micro and macro context on organizational routines. Principally, our paper has emphasised the role macro and micro contexts play in variation in routines and supporting the actions and innovation in organizations. Therefore, this paper helps to provide practitioners with a guide to influence routines by improving the interaction between macro aspects and micro aspects, including the actors who perform routines.

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