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ORGANIZATIONAL ROUTINES
AND CONTEXT ALTERATION: A RECONCILIATION

The ability to adapt to a changing environment is necessary for the survival of organizations. The choice under uncertainty conditions is one of the central problems in managerial theories of choice. That is also the reason why evolutionary researchers seek a way of adapting to the environment, and one of the concepts embedded in an evolutionary stream are the routines. The routines constitute a generative, dynamic, and emerging system that creates various effects regarded as the continuum: from very stable to continuously changeable ones.

The purpose of the paper is to shed light on the routine concept based on the management, evolutionary and change literature. Consequently the paper presents a conceptual framework concerning the relationships between the relative rate of the context changes and the nature of routines, resulting in their different types. The potential setting and research directions for the empirical studies based on this conceptual framework have been also addressed.

The methodology encompasses a deductive approach and the method that has been used is critical literature studies. The overarching key finding of the paper is that routines constitute a social phenomenon that is always a barrier to changes, yet regarding evolutionary theory, it is also the chance for changes.

Keywords: organizational evolution and change, organizational routines, evolutionary approach

1. INTRODUCTION

Rapid changes and unpredictable events occur in the business environment. The question of how companies can survive and succeed in fast-moving, uncertain environments has increasingly captured the attention of management scholars. Increasingly, the success of enterprises is dependent upon their ability to adapt. Nelson and Winter (1982) have suggested that the long-term development of a firm, and hence its strategy, is governed by certain types of routines. These routines are firm-specific and they differ from one firm to another.

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The paper content is embedded in the evolutionary approach in management, especially in terms of evolution object, namely organizational routines as well as concerns issues of environmental uncertainty conditions. Contemporary highly complex and even uncertain business environments call for a better understanding of the roles that organizational routines play in dealing with an unpredictable environment.

The routine is a basic analytical concept in the evolutionary approach to the firm. This does not mean, however, that the routine is a simple, uniform element of analysis. From an evolutionary viewpoint, a company is a set of evolving routines.

The routines might be related to an organization's ability to cope with uncertainty, these still make it hard to pinpoint what exactly differentiates organizations that navigate such uncertainty successfully from those that do not.

The uncertainty arises when a decision can lead to more than one possible consequence. As a result it is a source of frustration in terms of an intentional choice. The standard conceptualization of uncertainty is usually based on the classification that differentiates the realm of decision-making under certainty, risk, and uncertainty. Rational choice theory recognizes the problem of choice under uncertainty within the utility maximizing approach (Becker, Knudsen, 2001).

Very inspiring for our research is the clear statement that 'greater uncertainty will cause rule-governed behaviour to exhibit increasingly predictable regularities, so that uncertainty becomes the basic source of predictable behaviour' (Heiner, 1983).

In many papers the focus is on the constraining characteristic of routines. Sometimes the advice is that routines have to be 'broken' in order to enable a change. This message is excessively strong and unrepresentative. Rather, it is important also to take into account the 'twin'-role that routines are attributed to have: routines are seen not just as constraining, but also as enabling (Foss, 1996; Hodgson, 1997, 1998; Foss, 1997). Cohen (2007) referred it to as a 'pattern-in-variety'.

Nelson and Winter (1982) employed the concept of routines or rules to illustrate not only the adherence to norms and conventions, but also the emergence of new patterns of behaviour. The dynamic adjustments of routines emerge when firms search for new responses to changes in an external environment or try to adapt themselves to unpredicted circumstances.

Hence the motivation for preparing the paper was the attempt to systematize a 'routines' phenomenon in terms of the (a) routinization

processes and their consequences, (b) processes of changing routines (exogenously or endogenously) and even of evolving them - in a plausible way owing to the very dispersed treatment of those issues in the literature, (c) future research directions since the paper constitutes part of a project concerning the intra-organizational mechanisms of routines' selection.

Therefore the purpose of this paper is to shed light on the concept of routine, especially in terms of the changing environment (context), based on the management, evolutionary and change literature. Specifically, so as to realize the paper's aim, the following research questions have been addressed in the study:

RQ1. How can the 'routines' concept be conceptualized on the basis of the relative rate of routines change and relative rate of context alteration?

RQ2. What types of routines can be discovered based on the appropriate literature to enhance the conceptual frames in researching routines dependent on environmental conditions?

The main justification for addressing the research questions mentioned is that although the current state of the art in the field of organizational routines provides a sufficient base for exploring that phenomenon (i.e. Nelson, Winter, 1982; Hodgson, Knudsen, 2004; Becker, 2002; Becker, et al. 2005; Feldman, Pentland, 2003; Pentland, Feldman, 2005; Pentland, et al. 2009, 2010, 2011, 2012; Rerup, Feldman, 2011), it does not explicitly express any models and even framework conceptualizations with exact operationalization suggestions. The fact that organizational routines seem to be more or less vulnerable to the context and environmental changes - what is extensively approved by the relevant scholars is the reason why the purpose of the paper is concerned with endeavours of conceptualizing the phenomenon of organizational routines in terms of the aspects of changes and environmental conditions.

In the sections that follow, this study: (1) explains the concept of routines by reviewing different streams of research as for ontological aspects; (2) argues that the context dependency of routines results in different types of routines and different routines' dynamics contingent upon environmental conditions, (3) provides guidelines for the future research.

2. ROUTINES

2.1. Ontological concept

Nelson and Winter (1982) rejected the notion of maximizing behaviour effects. The routines (a core concept of Nelson and Winter's early theory) influence striving for novelties, sustain organism's features and determine

their possible behaviour similarly to the environment. Contemporary behaviour through the mechanism similar to inheritance, determines the future behaviour. The routines constitute something more than regular and predictable business behaviour. The notion of routines means also relatively stable tendencies and strategic heuristics that create a way of an enterprise's attitude to non-routine problems. The routines have been developed as a way of adapting to the environment and to the conflict of interests of the organization's members. Setting and sustaining routines make possible effective operating, reliable planning, controlling, repeating, and even imitating. It is also the basis for establishing goals and tasks in a stable or changing situation. Hence, stability is not necessarily a state liberated by routines.

Nelson and Winter (1982) introduced a wide variety of metaphors for routines: routines as genes, routines as memory, routines as truce, routines as targets for control, as replication, and as imitation. According to Nelson and Winter (1982), routines and competencies whose diffusion determines the survival or death of an organization are the subject of selection (mainly at an organizational level). Nelson and Winter's ground-breaking approach has revealed routines as a salient element of the evolutionary process. Nevertheless, despite the relative clarity of the concept, the problems connected with exploring routines have not been unequivocally solved. Hodgson (2003), amongst others, thoroughly and creatively criticized that notion.

Due to Dawkins (1976), routines are endowed with a selfish gene causing that routines and competencies do not care for an organization and the organization lives until routines are being promoted (retention or replication). Dawkins introduced the notion of 'meme', which means an autonomic unit that is imitated under replication and mutation. On the other hand, assuming the existence of epistasis, routines cannot live in isolation. Without regard to the epistemological approach considered, the selection is connected with the results achieved and its subject constitutes routines and competencies (regardless of whether we accept the thesis about routines' isolation or we assume that they function in a context). The way in which routines and competencies are reveal in actions is significantly compelling in the process of organizational evolution.

The routines are explained in different ways, however the following questions occur: what kinds of behavioural tendencies are qualified as routines, and what kinds are not? Why are routines qualified as replicators, yet rules and structures are not (Hodgson, Knudsen, 2004)? There is a lack of a substantive definition of the 'routines' concept in terms of their content. For instance, Becker et al. (2005) placed the authors of the 'routines'

conceptualization into three different groups. The first one defines routines as behavioural patterns. The second group defines them as rules – standard operating procedures – in the same sense that the first group agrees that they are recurring patterns. The last group defends the idea that routines are a collective willingness to adopt acquired or previously used behaviour according to the certain stimuli or context.

Admittedly, the term 'routines' ought to be understood as 'recurrent patterns of interaction' (Becker, 2002). Hodgson and Knudsen (2004) state that routines constitute 'organizational meta-habits' that cannot be reduced to the individual level. When defined as behavioural tendencies, routines become non-observable, which clearly complicates empirical analysis and testing hypotheses. The routines are generative systems that produce repetitive, recognizable patterns of interdependent action carried out by multiple participants (Feldman, Pentland, 2003; Pentland, Feldman, 2005). Egidi found that "organizational procedures (routines) (...) emerge as the outcome of a distributed process generated by 'personal' production rules" (Egidi, 1996). Hence, the collective element might arise out of the interplay of individual rules.

Since routines do not require attention, individuals are not usually aware of them as long as they run smoothly, and only become aware of them when they do not. In common terms, a routine is what does not change itself. Nonetheless, the research work of Feldman, Pentland (2005), emphasizing an ostensive and performative definition of routines, reveal new research fields and ways of understanding the routines. An ostensive side of routines means 'abstract, cognitive regularities and expectations that enable participants to guide, account for, and refer to specific performances of a routine.' A performative aspect is the way in which the procedures (work logs and databases) are executed (Feldman, Pentland 2003, 2005). As for the performative term, there is the possibility that routines are continuously changing, as they are related to specific actions. Due to the ostensive sense, routines as codified and prescribed abstract patterns are determined by artefacts (Pentland, Feldman, 2005). 'Artefacts can reflect either the ostensive aspect of a routine (as in the case of a written procedure) or the performative aspect of a routine (as in the case of a transaction history or tracking database)' (Pentland, Feldman, 2008). As they argue, these two aspects are mutually constitutive; the ostensive character does not simply guide performances, it is also created by them.

Howard-Grenville (2005) explains why flexible routines are able to be kept after some time. The author also endeavours to explain the agent's

impact on lodging routines. The routines are thought traditionally to constitute a source of inertia, calmness, stability and their change is usually regarded to be a result of adaptation necessity. Additionally, it is said that routines change themselves every day (Feldman, 2000, 2004; Pentland, Feldman, 2003) and intentional changes do not result in the changes of routines. Table 1 illustrates the synthesis of routines ontological concept.

Table 1

The synthesis of routines ontological concept

Ontology	Description
Routines as relatively stable tendencies, strategic heuristics, and memory	Routines create a way of an enterprise's attitude to problems, even those non-routine ones as well as a way of adapting to environment and to conflict interests of organization's members; the basis for establishing goals and tasks in both a stable or changing situation.
Routines as the element of an evolutionary process, especially the selection subject	Routines exist in the hierarchy of replicators as the derivative of interactors' hierarchy. They constitute targets for control, replication, and imitation.
Routine as a category possessing a selfish gene	It causes routines and competencies do not care for an organization and an organization lives until routines are being promoted (retention or replication).
Routines as truce	Routines are the liaison between an organisation and environment since they enable the enterprise to develop the mechanisms of adaptation.
Routine as a meme	An autonomic unit that is copied by imitation being under replication and mutation.
Routines as behavioural patterns	They reveal recurrent patterns of interaction.
Routines as rules	They function as standard operating procedures.
Routine as a collective hallmark	They liberate willingness to adopt acquired or previously used behaviours according to the certain stimuli or context.
Routines as organizational meta-habits	They cannot be reduced to the individual level as behavioural tendencies; consequently, they become a non-observable phenomenon.
Routines as generative systems	They produce repetitive, recognizable patterns of interdependent action carried out by multiple participants.
Routines as organizational procedures	They emerge as the outcome of a distributed process generated by 'personal' production rules.
Routine as the concept with simultaneously performative and ostensive character	Performative character: routines are continuously changing, as they are related to specific actions. Ostensive sense: routines as codified and prescribed abstract patterns are determined by artefacts. These two aspects are mutually constitutive.

Source: own study.

2.2. Characteristics of routines. Ambiguities and inconsistencies

Although many years have elapsed since Nelson and Winter's publication emphasizing the salience of the routines in the process of evolution, many ambiguities and inconsistencies still supervene in the routine concept. On one hand, those ambiguities and inconsistencies are associated with the characteristics of routines. On the other hand, they are identified in the context the role of routines. The routines popularized by Nelson and Winter (1982) constitute patterns whose content is as follows: an action (Jarzabkowski, Wilson, 2002), an activity (Dosi, et al. 2000), behaviour (Nelson, Winter, 1982), and an interaction (Teece, Pisano, 1994).

Referring the term 'routines' to the organizational level (Dosi, et al. 2000), they are repetitive and persistent (Knott, McKelvey, 1999) as well as collective (Nelson, Winter, 1982). The routines can be distributed (Simon, 1992; Winter, 1994; Zollo, Winter, 2002) which reflects that knowledge held by different organizational members is not completely overlapping (Zollo, Winter, 2002). Additionally, non-deliberative and self-actuating routines are characterized by individuals following them without deliberation, without devoting conscious or explicit attention (Pentland, Rueter, 1994). Moreover, routines reveal processual nature, they are context-dependent, embedded, and specific; routines are embedded in an organization and its structures, and are specific to the context (Teece, et al. 1997). Thus the successful application of routines depends on the specificities of the context in which the routines are applied. The context is also important owing to complementarities between routines and their context. Some routines need complementary elements in order to work. The routines are transferable to a different context only to a very limited degree, as the knowledge bound by routines is procedural and path dependent. Organizational routines can easily be disrupted by inattentive managers, and they appear to be difficult to transfer from one organization to the next (Aldrich, 1999).

The routines are path-dependent and shaped by history (Nelson, Winter, 1982; Foss, 1997; Teece, et al. 1997). They are created in the past. The way in which they will develop depends on the place in which they started out from (Dosi, et al. 1992). Based on the authors' previous statement, routines adapt incrementally to experience in response to feedback about outcomes (Levitt, March, 1988; Cohen, et al. 1996). Table 2 illustrates the synthesis of routines' characteristics.

Table 2

Synthesis of characteristics of routines

Characteristics	Description
Repetitive	Routines are characterized by the actor's capacity to repeat an action in a similar or entirely equal manner.
Collective	Routines are distributed across the organization, therefore are considered as a collective phenomenon, since they indicate that the knowledge is spread across the whole organization.
Non-deliberate, self-imposed	Routines have a character of automaticity; therefore, they do not require reflection to be put into practice.
Stable	Routines are persistent and foster specialization and coherence, besides minimizing conflicts.
Dynamic	Routines are dynamic and meet the company needs of adaptation to its internal and external contexts.
Processual	Routines are process phenomena; therefore, they consist of an independent set of actions.
Context dependent	Routines are important because of owing to complementarities between routines and their context. Some routines need complementary elements in order to work.
Path dependent	Routines are path-dependent and shaped by history.
Embedded	Routines are embedded in an organization and its structures.
Specific	Routines are specific to the context.

Source: own study.

2.3. Roles of routines. Ambiguities and inconsistencies

Organizational routines have been regarded as the primary means by which organizations accomplish much of what they do (Nelson, Winter, 1982). An indisputably salient issue is to establish the roles of routines. It seems that the roles of routines in organizations can be summarized as follows: to coordinate and control, to provide a 'truce', to economize on cognitive resources, to reduce uncertainty, to lead to inertia, to provide stability, to enable and constrain, to act as triggers and to embody knowledge.

In general, the roles of routines in organizations might be analysed from the perspective of duality, paradox, or the so called twin-roles perspective. One particular instance of these 'twin'-roles is the simultaneous problem-solving (Egidi, 1996) and the coordinating/governance character of routines (Coriat, Dosi, 1998). The enabling role of routines seems to be underestimated in much of the literature, however it is crucial. Moreover, enabling is not even in contrast to constraining. Many micro-processes are routinized in a quite 'constraining' way. It seems to be important not to lose sight of the role of routines in enabling certain activities.

In the same manner, empirical results more generally indicate support for both the constraining and enabling roles of routines. So far, empirical research on the enabling role has been focused on how routines enable individuals to save on cognitive resources and mental efforts (Egidi, 1996; Becker, Knudsen, 2001). Whether the enabling or the constraining effects of routines are more relevant in particular situations, this appears to be dependent on the level of formality and exceptionality of these conditions. A study of crisis situations showed that while routines present 'boundaries and constraints under normal conditions, they also act as powerful tools during exceptional times, such as crisis situations, serving as catalysts to release the disciplined energy of institutions to perform effectively, resolve problems and re-establish order' (Inam, 1997). Another historical case study of a well-known crisis found that leaders could intervene to override the constraining effect of routines – the finding that questions the idea of routines as necessarily highly constraining (McKeown, 2001). Table 3 presents the synthesis of routines' roles.

Table 3

Synthesis of roles of routines

Roles	Description
Offer coordination, control and coherence	Routines provide a structure, sequence and uniformity to the company actions.
Reduce uncertainties	Routines simplify, reduce the complexity of the decisions and increase the confidence on the standards adopted, therefore they minimize uncertainties.
Act like triggers	Routines can be triggered and trigger other routines.
Minimize conflicts	Routines mediate issues related to power disputes and conflicts.
Incorporate knowledge	Routines are the memory of organizations, the locus of knowledge.
Reduce the use of cognitive resources.	Routines lead to automatic actions, thus liberate cognitive space.

Source: own study.

The routines are essential due to the many immediate roles they play in organizations (for instance in coping with pervasive forms of uncertainty, cf. Becker, Knudsen, 2001). It is also worth stressing that embeddedness and agency may be key factors that shape the flexible use of routines and their change or persistence over time in other settings. Concluding, Cohen (2007) argues that even today, organizational routines are widely misunderstood as rigid, mundane, mindless, and explicitly stored somewhere.

3. ROUTINES IN THE CHANGING WORLD

3.1. Functions and dysfunctions

To emphasize once again, it seems that the roles of routines in organizations can be summarized as follows: to coordinate and control, to provide a 'truce', to economize on cognitive resources, to reduce uncertainty, to lead to inertia, to provide stability, to enable and constrain, to act as triggers, and to embody knowledge. Dealing with organizational routines, conceptual ambivalence is perceived as routines which constitute both a source of inertia and a means of permanent adaptation (Howard-Grenville, 2005). The routines can be simultaneously both a source of inertia and inflexibility as well as an important wellspring of flexibility and change. The routines in business organizations are frequently very persistent, even to the extent that they promote inertia (Baum, Amburgey, 2002; Hannan, Freeman, 1989).

Although Nelson and Winter put a lot of emphasis on the persistence of routines (this arguably is what their 'organizational genetics' is primarily about), there are many statements that routines might not be so persistent or stable after all. For one thing, Nelson and Winter maintain that firms actively search for better routines under prospects of adversity. Nelson and Winter argue that not everything in a firm's behaviour is a routine. The routines determine at the most what is predictable and regular in business behaviour (Nelson, Winter, 1982), missing out on the unpredictable and irregular parts. The routines reveal that they can change continuously and endogenously, which leads others to emphasize their role in flexibility and change (Pentland, Rueter, 1994; Feldman, 2000).

Hence, according to the different papers, organizational routines result in either inertia or continuous adaptation, or in both simultaneously (Mickaël, Frantz, 2013). Empirical evidence suggests that improvisation, *ad hoc* coordination and flexibility, allow organizations to survive and thrive in environments characterized by ambiguity and uncertainty; however, at the same time this may prevent organizations from developing efficient routines (Baker, Nelson, 2005).

According to Feldman and Pentland (2003), organizational routines are a well-known source of inertia (Hannan, Freeman, 1983), inflexibility (Weiss, Ligen, 1985; Gersick, Hackman, 1990) and even mindlessness (Ashforth, Fried, 1988). Population ecology favours the view that routines are inert, gene-like entities (Hannan, Freeman, 1989), while evolutionary economics

in the light of Nelson and Winter's theory view routines as subject to both adaptation and selection processes. The processes of selecting routines might be proceeded in an effective or ineffective for an organizational way which results in either positive selection enabling the organization to change, adapt, and reduce environmental uncertainty or negative one impeding flexibility and adaptation capabilities. Consequently, selection processes might result in either functions or dysfunctions of routines.

The routines have traditionally been perceived as a source of organizational inertia, and their intentional recombination as a source of organizational adaptation (Nelson, Winter, 1982). Nevertheless, recent work also demonstrates the opposite: the everyday use of routines can bring about change (Feldman, 2000; Feldman, Pentland, 2003; Pentland, et al. 2011), and the intentional alteration of routines can result in no change (Feldman, 2000, 2003).

Organizational routines are also a source of mindlessness which influences economizing on cognitive resources. The routines economize on cognitive resources by two mechanisms. First, as learned routines become more automatic, mental resources free up (Postrel & Rumelt, 1992), so that at the higher levels of awareness, mental deliberation and decision-making capacity becomes available for the more complex decisions (Hodgson, 1997). Second, routines focus attention. They guide search and reduce the space of events that managers should scan in order to avoid bad surprises and take advantage of good ones (Shapira, 1994; Swaan, Lissowska, 1996). This effect is attained by ignoring what is not given attention (Garud, Rappa, 1994).

Then attention can be given to what deviates from normal conditions (Finne, 1991) - that is, to be precise, recurring elements (of the routine itself) that are not in the focus and do not receive attention. Such recurring elements are recognized at a semi-conscious level. Through the two mechanisms specified above, the routines help economize upon limited cognitive resources in two ways: they focus attention on certain elements, thereby guiding search by experience, and they free up cognitive resources

Table 4

Functions and dysfunctions of routines

Dysfunctions	Functions
Source of organizational inertia	Source of organizational adaptation
Source of organizational inflexibility	Source of organizational responsiveness/flexibility
Source of mindlessness	Source of mindfulness

Source: own study.

to be allotted to exceptional cases by relegating recurrent problems to the realm of the semi and sub-conscious.

There is clear empirical evidence that routines allow individuals to save on mental efforts and thus preserve scarce information-processing and decision-making capacity (Egidi, 1996). Empirical research indicates that one way in which routines can achieve that is by focusing the attention of actors, through a predisposition to respond to issues in certain ways (Weick, 1990), by providing a first guess at a problem solution or by economizing on the time necessary for reaching a solution (Betsch, et al. 1998). Table 4 presents the summary of functions and dysfunctions of routines.

3.2. Endo- *vs*. exogenous dynamics of routines

Considering the dynamics of routines, the following question occurs: is the routine's change more endogenous or exogenous – propelling by the change from environment? Answering that question has an impact on the perception of reality and consequently determines a particular thought framework in examining that phenomenon.

Billinger, et al. (2014) indicate that prior research has identified two different types of sources of change in routines: exogenous and endogenous ones (Feldman, 2000). There are several environmental antecedents of the routines' change, such as external surprises in the context. Managers might also constitute a source of exogenous change in organizational routines implementing top-down intervention which is also an important form of exogenous influence on routines and change of routines (Pentland, Feldman, 2008).

The routines can change themselves, not just due to exogenous pressures for change (Gersick, Hackman, 1990), but even without such pressures, as the participants in routines are also able to change them endogenously (Feldman, 2000, 2003; Feldman, Pentland, 2003; Pentland, et al. 2009, 2010, 2011, 2012; Rerup, Feldman, 2011).

Feldman, Pentland (2003) have identified mechanisms of guiding, referring, and accounting by which participants in routines can create variations that other participants recognize as legitimate. The routines thus change endogenously as people react to the outcomes of prior iterations of a routine or retain changes introduced by other participants in a routine (Feldman, 2000; 2003; Feldman, Pentland, 2003; Pentland, et al. 2011, 2012). Through those mechanisms, the same routine can generate many different patterns (Pentland, et al. 2010). Therefore, a 'tendency toward

endogenous change is a natural part of routines' (Pentland, et al. 2011). In addition, Feldman (2000) argues that when outcomes of action fall short of ideals (i.e. do not produce the intended outcomes), agents reflect on and react to those outcomes, i.e. by making efforts to change or 'repair' routines to attain these ideals or by expanding them to take advantage of new possibilities. Hence, a very salient issue is to distinguish ostensive and performative character of routines.

3.3. Organizational routines and context

The results of examining routines from the context perspective are ambiguous. As mentioned above, the discussion on the impact of endogenous and exogenous changes on routines is still present. Consequently, the following question appears: do routines constitute a mechanism enabling to cope with environment uncertainty or organization's complexity?

In accordance with an external context, it might be operationalized in terms of predictable environments, high velocity environments, and extremely uncertain environments (Suarez, Montes, 2014). This systematization refers to the relative dynamism of the context. Under conditions of predictable environments the cornerstone of organizational activities are routines formed gradually by practice and continuous improvement and oriented to efficiency in the execution of tasks (Nelson, Winter, 1982). High velocity environments (according to Eisenhardt and Sull, 2001) force the organization to use simple rules. This is favoured by heuristics created from a base of routines and experience. In such circumstances, most important is the speed measured by fast decision making, flexibility, and managing complexity. Extremely uncertain environments turn organizational attention to a novel, untried recombination to open up new courses of action where intuition plays a crucial role. This starts from a strong base of routines and heuristics.

Since different environmental conditions require organizations to use the appropriate type of a routine, we propose that environmental dynamism results in four types of organizational routines as shown in Table 5. The labels used for describing a routine are borrowed from Howard-Grenville's work (2005), in which he states that embeddedness and agency may be key factors that shape the flexible use of routines and their change or persistence over time in other settings.

The routines, as stated earlier, are specific to the context (Teece, et al. 1997). Thus the successful application of routines depends on the specificities of the context in which the routines are applied. The context is

Table 5

Types of organizational routines dependent on the context dynamism

Dynamism of the context	Rate of change in routines	
	Low	High
Predictable environment	**Sticky Routine**: very persistent; little impetus or change from within.	**Arbitrary Routine**: changes only as a result of intentional redesign, or unintended slippage.
High velocity environment	**Accommodative Routine**: permits flexible use to pragmatically apply to the situation at hand, but variations rarely perpetuated.	**Pragmatic Routine**: changes as a result of emergent variation; responsive to shifts in situation at hand.
Extremely uncertain environment	**Pervasive Routine**: rather than changing over time, routine may 'take over' more problem situations and become more extensively applied.	**Adaptive Routine**: relatively easily adapted to new uses; many variants might coexist simultaneously.

Source: own study.

also essential due to complementarities between routines and their context. Some routines need complementary elements so as to work. The concept of evolution worked out by Nelson & Winter (1982) presents the salience of mechanisms of internal control and monitoring conducted in an organization. Those mechanisms lead to such relationships between variability and stability that do not threaten the organization as a whole.

Organizations full of routines are not the objects repeating activities previously made *ad infinitum*. They are open for changes and they also create changes in environment. Organizational routines considered as abstractive ways of operating might be regarded as a stable order (a goal), however, only in the situation when a stable set of changing resources is imposed. The routines do not exist in a vacuum, and the resources are not unchangeable, consequently they have to be created in an appropriate context. Some of the tasks independently become routines, others are connected with *ad hoc* efforts to solve problems.

Our proposal in this paper suggests that routines constitute an important mechanism for coping with the environment. The relative dynamism of the context and rate of change in routines determine the adequate type of routine. Howard-Grenville (2005) highlights other research results that show routines being used successfully in dynamic environments. Some organizations that are highly routinized, like automobile manufacturing plants, can nonetheless respond flexibly to changes; and others operating in turbulent,

hypercompetitive environments like telecommunications and electronics still develop shared routines or cognitive frameworks that guide actions.

Turning the direction of causality, we find that enhanced routinization may be viewed as an uncertainty impairing a strategy (see Hodgson, 1998). Thus, firms may (1) increase predictability by fixing certain parameters, and they may, at the same time, (2) free limited cognitive resources. Not only do institutions and routines work as constraints but, as stressed by Hodgson (1998) they are also sources of regular and predictable behaviour in the face of uncertainty, complexity and information overload. The routines allow managers to cope with uncertainty under the constraint of bounded rationality because they can be used to save on mental efforts and thus preserve scarce capacity required to deal with non-routine events (Egidi, Ricottilli, 1997). Hence, the routinization leads to an increase in responsiveness since attention is usually focused on non-routine events.

Several studies have found that time pressure increases the likelihood of routine choices (as opposed to non-routine ones), even if the inadequacy of the routine was indicated before the choice (cf. Betsch, et al. 1998). Under increased constraints such as time pressure, prior knowledge gains a stronger impact on choices and can overrule new evidence in the decision process. Under time pressure, behaviour tends to be more routinized.

Freeing up mental resources by means of routines is also a crucial contribution to the ability of actors to cope with complexity and uncertainty. As routines free up mental resources, it becomes possible to act even when there are problems of evaluating all the alternatives in the time available and under conditions of complexity and uncertainty. According to Becker and Knudsen (2001), there are two mechanisms underlying the capacity of routines to deal with uncertainty. One mechanism is about freeing up mental resources, another one is the means by which routines enable actors to act under uncertainty and concerns introducing predictability by fixing certain parameters (Hodgson, 1988).

Some empirical results support the idea that routines can indeed reduce uncertainty (Egidi, 1996; Becker and Knudsen, 2001). The results of experimental study have demonstrated that routines "enable individuals to (...) radically reduce the complexity of individual decisions" (Egidi, 1996). Additionally, it has been found in the case study that 'the development of individual routines is accompanied by reduced uncertainty and increased confidence in the appropriateness of typical response patterns.' A survey based on the above mentioned study has allowed to test a set of hypotheses pertaining to the uncertainty-reducing effect of routines, explicitly taking

into account pervasive forms of uncertainty (Becker, Knudsen, 2001). In particular, routinization was tested against an increased information flow as a way of dealing with uncertainty. The most important outcome was that the results strongly supported the hypothesis that increasing routinization would decrease perceived uncertainty. The results strongly support the idea that routines can serve as a way for dealing with uncertainty, in particular where uncertainty is pervasive.

The research conducted by Pentland, et al. (2011) constitutes a significant empirical support for the research field in the dynamic character of routines. That empirical evidence shows that a particular situation determines either the need for changes or a lack of it. Those research results give an additional argument as for the fact that discussing the role of routines as well as their dualities and paradoxes, it seems to be congruent to use one of the most quoted phrases in the Bible telling us that there is a time for everything.

DISCUSSION

The approaches in the evolutionary stream, especially as for issues o routines issues, undertaken by evolutionary economics and an evolutionary field in strategic management have been reviewed in the paper. The paper contributes to the academic discussion on routines roles in dynamic, uncertain, or even complex environments, in particular it contributes to delineate the dynamic context of existing and emerging routines and its salience in terms of adapting and dealing with uncertainty.

The most disputable aspects of perceiving routines (their characteristics, roles, functions, dysfunctions, dynamics, and context) concern the following issues: (1) the aspects of routinization that concern on the one hand the capabilities of learning and organizational competences as for decision-making processes, on the other hand – inertia reducing environmental awareness and responsiveness; (2) accelerating routine changes either exogenously or endogenously and the degree of focusing on attention resulting inter alia in the extent of flexibility and reducing uncertainty; (3) the role of emerging novel routines not only in the processes of adapting, but also in entrepreneur and innovative behaviour; (4) the phenomenon of evolving routines and its role in adapting and dealing with uncertainty.

As shown in Table 5, this study suggests that routines can be operationalized as sticky, arbitrary, accommodative, pragmatic, pervasive, and adaptive phenomena based on the organizational change, evolutionary and management

literature as well as placing different types of routines contingent upon the environmental conditions.

Routinization has both positive and negative effects. On the positive side, routinization is a major source of learning and an organizational competence. An important feature of a stable routine action is the reduced cognitive demand that such behaviour has on the decision-maker (Levinthal, Rerup, 2006). By routinizing, individuals and their organizations economize on attention by enabling complex coordination with little reflection. Besides, routinization fosters faster decision-making, which in turn allows decision makers to keep pace with change achieving superior performance (Eisenhardt, 1989). The speed of task performance is a principal indicator of routinization (Cohen, Bacdayan, 1994; Weiss, Ilgen, 1985). On the negative side, routinization leads to inertia as routines are difficult to be changed (Nelson, Winter, 1982). Over time, reliance on standardized behaviour patterns is accompanied by reduced cognitive activities and the attention focuses only on few salient features thus reducing environmental awareness and responsiveness (Laureiro-Martínez, et al. 2010).

The discussion on the routines focuses, inter alia, on their dynamics. Many scholars attempt to answer the question whether routine change is accelerated exogenously or endogenously. The results of such studies are crucial in the search for a clear answer to the question of whether the roles of routines in organizations concern reducing uncertainty.

The uncertainty is a category immanently associated with the external context. When faced with extremely uncertain circumstances, most organizations do not come up with responses that are markedly different from their learned patterns and experience. The uncertainty arises when a decision can lead to more than one possible consequence (Radner, 1994). The uncertainty thus frustrates an intentional choice. The standard conceptualization of uncertainty is usually based on the classification that differentiates the territory of decision-making under certainty, risk, and uncertainty. A rational choice theory recognizes the problem of choosing under uncertainty within the utility maximizing approach.

Some research shows that, when faced with high uncertainty, organizations lean towards 'regression to first learned responses' (Allnut, 1982), tend to operate by 'narrowing the focus of attention' (Hammond, 2000) and exhibit less requisite variety (Weick, 1990). By narrowing the focus of attention, the organization reduces search and attention by focusing only on those factors that are filtered by the experience. These heuristics concentrate the organization's dynamics on a selected set of memories, resources and

alternatives, thereby providing speed and flexibility in decision-making, but at the same time limiting the total possible set of responses and recombination to those that are consistent with learned patterns (Suarez, Montes, 2014).

The emergence of new, novel routines is decisively determined by: (1) socio-cultural rules concerning the acceptability of entrepreneurial and innovative activities; (2) the extent and content of education and training; (3) the prevalence of institutional rules that facilitate innovation and entrepreneurship; (4) the existence or otherwise of safety nets for entrepreneurial failures; and (5) the availability of resources to support enterprises.

The assembly of routines that has been loosely put together initially is transformed into a smoothly running complex economic system that delivers products efficiently. Yet, making systems work harmoniously in this way also involves behaviour that is emotionally driven. Due to this a success can sometimes be accompanied with misplaced confidence. This is another form of ignorance and it can lead to a lack of adaptiveness and the ultimate demise of an economic organization. Thus the 'creative destruction', which is much discussed in evolutionary economics, is a matter of emotional dispositions in states of uncertainty; first, in generating strong emergence through entrepreneurship and second, in creating conditions that result in the decline and demise of a previously successful organization (Foster, Metcalfe, 2012).

The endeavours, to precisely describe the way in which work is done entail acknowledging the changes in the performance of the tasks within what is called a routine. The routine thus evolves, but does not change! Cohen (2007) calls this paradox the '(n)ever-changing world.' The performance of occurrences evolves, yet the routine 'stays on track' (Schulz, 2008). Ostensive and performative theories of organizational routines (Feldman, Pentland, 2003) as well as the research conducted by Pentland, et al. (2011) considering stability and change in organizational routines exactly from the perspective of the "(N)Ever-Changing World' offer a good explanation in that field.

In the light of our research, a number of key directions for future research can be identified. As noted above, a number of inconsistencies and ambiguities exist to be aimed at a theoretical and empirical explanation of the detailed research of routines. The directions of future research ought to therefore be focused on conceptual development and empirical investigation, especially in terms of routinization consequences for an organization, endogenous and exogenous dynamics of routines, socio-cultural aspects of evolving given

routines and emerging novel ones as for the possibilities of adaptation or even entrepreneur and innovative behaviour.

All these disputable issues delineate potential research directions, including: (a) examining deviation between ostensive and performative character of routines influencing sustaining inertia or encouraging to changes; (b) researching the influence of using both current routines and novel ones (equilibrium *vs*. adaptation); (c) examining the aspects of internally and externally selecting routines; (d) identifying exogenous and endogenous determinants of routines; (e) identifying, exploring, and explaining the behavioural and cultural determinants of revealing, developing, sustaining current routines as well as obtaining or liberating novel ones; (f) examining the aspects of emerging and coevolving routines; (g) setting the level(s) of examining and interpreting routines dependent mostly on the model of multi-level selection; (h) examining formal and informal hallmarks of routines; (i) testing the degree of routines' conscious character – taking into consideration similarities and differences between routines and habits, especially in terms of inter alia the extent of consciousness, attention, and mindfulness; (j) examining the role of artefacts in the processes of coevolving routines and transferring from the unconscious character to the mindful state; (k) researching the aspects of imitating routines *vs*. developing novel innovative ones; (l) and others.

A salient problem concerns the influence of deviation between ostensive and performative character of routines influencing on either sustaining inertia or encouraging changes. In some cases an ostensive aspect of routines means either a short-term goal or an ideal vision to be achieved – then it is rather immutable. In other cases the changes of realizing procedures enable to change the ostensive character of routines (to expand the expectations regarding that character). These two dynamics are connected each other and create a continuous cycle of endogenous changes. It discloses some additional research areas such as organizational learning (routines are solidified and historically implied constituting the stocks of organizational memory (Vera, Crossan, 2005)), political forces, dispersed contextual focus on various aspects of routines by various organizational groups. The latter aspect determines two additional research fields: concentration on how routines are shown (formulating principles) and concentration on how routines are performed (explaining practice). Consequently the disadvantage might be one-sided, focusing either on the inert role of routines or on their endogenous and changeable characteristics. Thus both directions are essential and they ought to be coherent.

In accordance with the aspect of exploiting routines, every organization must exploit old routines over time to achieve organizational goals and sustain internal balance. Paradoxically, those old routines constitute the base under unpredictable conditions and in the case of their efficiency they are willingly used in the future and are solidified as artefacts. The old routines unite, stabilize, decrease uncertainty and lead to internal integration enabling an enterprise to adapt (internally and externally). They provide proven methods and instruments of solving problems and help understand and interpret them. Old routines express the way of understanding organizational world and introduce the patterns for selecting and interpreting functional programmes. On the other hand, every organization must explore new routines over time to adapt to changing environments, which ultimately leads to the creation of new routines and the demise of old ones.

The routines, as the object of continuous evolution, change themselves and they are determined by environmental changes and managers' behaviour. Hence a meaningful contribution to the evolutionary field would be an understanding of the endogenous and exogenous determinants of routines. So as to deepen the exploration of routines, it is necessary to analyse, recognize the essence of organizational routines, and interpret the phenomena perceived externally and then to attempt to know the determinants embedded internally. Interestingly, this is strictly related to the issues of internal and external selection – as one of selection typologies (Campbell, 1965; Hodgson, Knudsen, 2004; Miner, 1994). The processes of both external and internal selection are strictly interrelated each other. Specifically, external selection's processes and sub-processes determine how environment selects organizations that will survive in the future or not (the environment as an evolution agent). Internal selection permeates selective mechanisms influencing the dynamic of an evolving system. The scholars examining internal selection perceive managers as basic agents of evolutionary change as they decide (Henderson, Stern, 2004) about retaining or eliminating selection objects (i.e. routines, habits), and potentially seek solutions protecting an enterprise's survival. Consequently, identifying, exploring, and explaining intra-mechanisms and underpinnings of internal selection seem to be crucial.

The behavioural and cultural implications of managers' behaviour might constitute significant determinants of internal selection helping identify, explore, and explain the conditions of revealing, developing, sustaining current routines as well as obtaining or liberating novel ones. Managers as change agents select for an organization and it is recognized that the

intentional and deliberate process of making decisions is used here (Geisendorf, 2011). Hence, managers' decisional choices determine the degree of enterprise's adjustment to the change of conditions in the environment. Volberda and Lewin (2003) emphasize the intentionality of evolution agents' behaviour as well as arguing that intentional selection releases co-evolutionary processes.

The decisional choices of managers are determined by selection replicators (decisional patterns, habits and mental processes in that case) and simultaneously they are implied by some intra-behavioural characteristics related to the phenotypic hallmarks of a person that according to Durand mean some observable features resulting from the interaction between genotypic characteristics and the environment (Durand, 2006, cf. Mayr, 1991, 2001). Consequently, it seems to be significantly salient to identify and explore those intra-behavioural characteristics determining selection processes, including inter alia habits, mental processes, perception, cognitive biases, consciousness degree of routine disposals, mindfulness extent, attention, responsiveness, intentionality and so forth. Nevertheless, it highlights an additional concern that ought to be undertaken: is the selection of routines a deterministic process or a phenomenon *a posteriori*? Moreover, managers' predispositions for making particular choices are determined culturally as well. The values incorporated by a manger to an organization and the values assimilated from organizational culture determine the way of employee behaviour.

Consequently, the following questions occur: which factors influence evolutionary changes of routines? is that number finite? These doubts result from the emergent character of routines which constitutes a very important research direction. The context of emergence and coevolution of organizational routines pertains to the dilemma regarding interpretative possibilities. An emergent phenomenon is irreducible so it is not possible to analyse it through its elements – the lower levels of analysis in that case. Emergent phenomena appear after attaining by a system a given threshold of complexity and relationships in an organization (and between an organization and environment). The emergence means that only interactions amongst constituents lead to create an order. Thus routines ought to be analysed as a whole and assuming that routines are collective they should be explored at organizational level. According to Becker (2004), some routines generate others and they are interrelated one another. In a similar vein, Pentland and Feldman (2008) state that 'routines are difficult to observe, distinguish, compare and count'.

The issue of transferring routines' reinterpretation from the individual level to organizational one has not been recognized yet and implicates a research gap. Additionally, it is associated with multi-level selection embedded in the stream of model evolutionary realism and implying the variation and hierarchy of replicators (genes, habits, routines, meta-routines/ dynamic capabilities) and interactors (persons, groups, organizations, sectors, meta-populations). The multi-level selection analysis might allow to establish a proper perspective for examining routines in terms of some similarities and differences between habits and routines which outlines the next research direction. In the processes of selecting habits as well as routines, two sub-processes can be distinguished: the process of replicating routines/habits and the process of the successive selection of replicating habits/routines. Nevertheless, what discriminates between habits and routines is that the selection of habits does not require a cohesive group of units – it even might concern a singular one. The successive selection of habits necessitates interaction amongst units, yet not necessarily stable relationships or cohesive groups. However, all types of selection and replication of routines concern the group of units that ought to be cohesive and interactive enough so as to sustain joining habits strengthening routines (Hodgson, Knudsen, 2004).

For the future research it is crucial to be conscious that organizational routines are not only formal ones. They might occur as formalized and non-formalized procedures and various programmes (tangible, i.e. software, and intangible, i.e. written or unwritten principles of actions). Thus the tangible and intangible sides of organizational routines and their role in the process of evolving routines and responding to changes both internally and externally ought to be examined.

As far as routines might have an unconscious character, eventually revealed in the process of changes since under stable conditions managers do not consider routine actions. However during the changes they feel the need to identify old routine behavioural patterns in the face of novel ones. The routines are frequently hidden (an intangible side) so that they will be disclosed in the process of changes (a tangible side). Revealing and executing routines constitute the determinants of an organization's survival and contribute to understanding the essence of the process of changes.

Additionally, it is worth excogitating in the future research to get to know the essence of organizational routines by means of identifying their symptoms in the shape of artefacts as organizational routines are strengthened as symbols and patterns reflecting the deeply hidden way of thinking and perceiving

organizational environment. Those might be cultural artefacts including physical, behavioural, and language that transmit and transfer unconscious or known behavioural patterns. Symbols sustain, develop, and transfer to members of the organization assumptions, interpreting and orientating patterns as well as value systems in a given organization. The artefacts are important in transfers in terms of a tangible and intangible side. They are also significant in the process of coevolving routines inside an organization (codified or pointed by different artefacts, organizational routines might strengthen or hamper new routines). The routines, to which a symbolic meaning is given fast and easily, are liable to a new repertoire of routines. In other words, symbolically strengthened routines create a new pattern in terms of effective changes (unnecessarily proper in the long-term perspective).

According to Pentland and Reuter (1994), 'we draw attention to artefacts (…) because they have been particularly prominent as a means of collecting data about routines.' A nagging research question that also should be taken into consideration is which (and to what extent) strategy of creating organizational routines is appropriate for surviving and developing? There are two possibilities: imitation (exploration) and creating new innovative routines (exploitation). The effectiveness of both of them is disputable. It is easy to imitate organizational routines strengthened as easily observable artefacts. The imitation of particular singular artefacts is not satisfactory (emergent structure of routines) and the imitation of their repertoire is not possible and effective (different organizational routines might be created due to various behaviour, interpretation, adaptation process, and culture). It suggests rather focusing on exploiting possessed routines than on seeking new ones or copying from successful enterprises. The evolution of current routines is, however, risky as for the possible choice of a pattern inappropriate for organization's survival – although it seems that the risk is less in seeking quite new routines. As for the latter situation, the usability of a new pattern in the long-term perspective is also unpredictable and might threaten growth. Perhaps the effectiveness of choosing either imitation or the creation of innovative routines in an organization depends on the sector, branch, organization's size and other situational factors. This issue constitutes a research gap as well.

Additionally, future work could look further at the implications of embeddedness, agency, power, and micro-foundations for routine performance and organizational outcomes. Obviously all those disputable issues and research directions permeate each other, which constitutes methodological concerns and challenges.

Figure 1 presents the basic subjects of discussion in terms of routines and consequently the research directions.
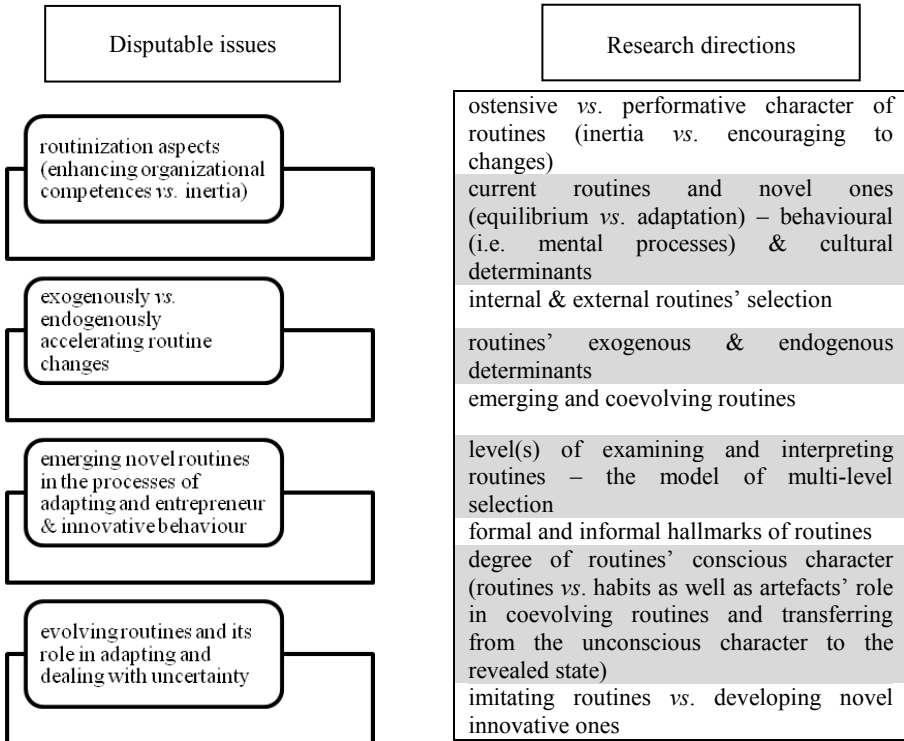

Figure 1. Organizational routines. Disputable issues and research directions (not exhaustive lists)

Source: own study.

CONCLUDING REMARKS

The paper responds to the research questions assumed in the introduction and therefore realizes the paper's purpose proposing the theoretical framework as for the recognizing, explaining, and exploring the 'routines' phenomenon under uncertain environmental conditions as well as signalling the future research directions.

Evolutionists in examining management problems emphasize dynamic phenomena, highlighted by Winter (1982), the main representative of evolutionary economics, in the expression *dynamics first*. The issues connected

with growth mechanisms and with the possibilities of achieving a desirable (satisfactory – not optimal) growth path become more salient than the issues associated with growth optimization.

An evolutionary approach to the enterprise theory initiated by Nelson and Winter's work *Evolutionary Theory of Economic Change* (1982), explains a company's behaviour in the categories of adaptive mechanisms. Nelson and Winter took into consideration the dynamic attitude to an institution and growth represented by Schumpeter. They used the firm's theory and the category of dynamic equilibrium. The elements of the evolutionary theory of a firm are routine patterns of organizational behaviour. Additionally, institutional and organizational limitations between enterprises and the market are created by maximizing the development advantages of routine behaviour. As for that concept, an organization constitutes the derivative of cooperation between the set of routine behaviour and the environment.

Summarizing, as for the RQ1: How can the 'routines' concept be conceptualized on the basis of the relative rate of routines change and relative rate of context alteration?, it generally might be concluded that routines could be explored as (a) relatively stable tendencies, strategic heuristics, and memory, (b) the element of an evolutionary process, especially the selection subject, (c) a category possessing a selfish gene, (d) truce, (e) a meme, (f) behavioural patterns, (g) rules , (h) a collective hallmark, (i) organizational meta-habits, (j) generative systems, (k) organizational procedures, and (l) the concept with simultaneously performative and ostensive character. Additionally, in line with the all the deliberations, the routines are active and redundant (latent). The routines interacting with the environment are the subject of mutation (innovations, new routines are created), recombination (imitation of competitors' routines, including them into active routines), transition (imitating competitors, including them into excessive routines), and transposition (including excessive routines into the active ones). Nevertheless, this does not result in scrabbling to seek new patterns and they are not here the source of inertia – as it is explained by a classic approach.

According to the RQ2: What types of routines can be discovered based on the appropriate literature to enhance the conceptual frames in researching routines dependent on environmental conditions? in general, the following types of routines have been distinguished: sticky routines and arbitrary ones (regarding predictable environment) as well as accommodative routines and pragmatic ones (in terms of high velocity environment). Consequently, the routines dependent on the context embody organizational mindfulness (Levinthal, Rerup, 2006) that might help recognize the context conditions

and the routines assigned to them. Moreover, Nelson and Winter, emphasizing the central role of routine behaviour, envisage that decision-makers have to operate under uncertain conditions as at a particular time. In accordance with evolutionist economics, business entities are recognized both as reducing uncertainty which has been met and tending to achieve business goals in compliance with a particular set of rules. As for this approach, the search/variation of routines is a deliberate process in which seeking better ways of actions aimed at improving an organization's future results (Zollo, Winter, 2002).

The proposed conceptualization of organizational routines is complementary to alternate concepts, however it offers new insights into the studies on organizational routines and it might provide the framework for further research aimed at operationalizing evolving organizational routines dependently on the environmental change. Not only do the paper's considerations and conclusions theoretically enrich the concept of organizational routines, but also result in some managerial implications. Contemporary organizations (especially in fast-changing industries) are forced to operate under uncertain environmental conditions which make them seek new organizational solutions and ways of understanding the reality. Comprehending the associations between organizational routines phenomenon and the organization's evolutionary change under uncertain environmental conditions might make managers more conscious and mindful of the potential opportunities to manage organizational change, even if it would only be an illusion of managerial control.

Concluding all the considerations and issues addressed in the paper, routines constitute a social phenomenon that is always a barrier to changes, yet regarding evolutionary theory, it is also the chance for changes.

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