

## **Routine Assembly: Institutionalizing Practices in a New Setting**

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### **Abstract**

This paper brings a study of replication of organizational routines based on a one-year ethnography of a new automotive plant, exploring the organizational processes behind routine formation. Applying institutional theory concepts and a structuration approach, the paper proposes a model to understand the different phases involved in the process of routine formation. The development of routines was a process driven both by structural features imposed by the parent organization and emergent patterns of interaction among organizational members. The case gives support to recent conceptualizations that stress the role of agency and change in organizational routines, and it adds to those studies by providing a detailed view of the processes of routine formation. It also contributes to studies on replication of practices by conceptualizing on the ramp-up phase of knowledge transfer.

### **Introduction**

Knowledge transfer in organizations has become a very important issue in the past decade, for a number of different reasons. First, firms are more often organized on a global basis and aim to achieve a certain level of coordination and sharing among their various units. This requires knowledge to be shared from one team, department or geographical division to another (Argote, Ingram *et al.*, 2000). Other drivers for knowledge transfer include the increasing frequency of alliances and acquisitions, where knowledge needs to be transferred between organizations, or the use of benchmarking as a tool to improve performance. But knowledge transfer is not an easy task (see for example the studies of (Galbraith, 1990; Szulanski, 1996; Argote, 1999). Different barriers arise in the process of transfer, resulting in high failure rates in the process.

Within this more general phenomenon of knowledge transfer, I will be analyzing the specific issue of replication of organizational routines. Replication of routines can be considered a special case of knowledge transfer: one where the organization wants to copy a set of practices from one or more of their existing sites to a new environment. This can be because they want to assure consistency in what they offer their customers or because they want to facilitate coordination among their various sites. The amount of replication achieved will depend on the quantity and complexity of the tasks being transferred: transferring a set of routines on how to produce and sell hamburgers is probably easier than transferring a set of routines on how to manufacture computer chips.

This paper brings a study of the replication of routines in a new automotive plant. The intended replication involved a high number of inter-related tasks, some of which quite complex. With that, it provides a rich setting to observe the process of transfer and evolution of routines. I will analyse below why this is relevant and what can be added to the current studies on the topic.

### **Routines as Behavioral Patterns**

Routines are seen as the building blocks of organizational capabilities (Dosi, Nelson *et al.*, 2000). Winter, for example, defines organizational capability as “a high level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type” (Winter, 2000: 983). That way, under the dynamic capabilities view, routines are one of the most important features of organizational life. Understanding what they are and how they are formed helps to understand how organizations achieve and sustain competitive advantage.

In fact, the importance of routines in organizational life has been recognized much before the rise of the dynamic capabilities view. The Carnegie school defended that routines govern most behavior in organizations, and they are characterized by a fixed response to defined stimuli (March e Simon, 1958; Cyert e March, 1963). In the evolutionary economics perspective, Nelson and Winter have routines as a central concept to their theory. They defined 'routine' rather broadly: "It may refer to a repetitive pattern of activity in an entire organization, to an individual skill, or, as an adjective, to the smooth uneventful effectiveness of such an organizational or individual performance" (Nelson e Winter, 1982: 97). These definitions stress repetition and stability, and refer to behavioral patterns. As such, routines have no intrinsic value – they are something within organizations that may have a positive, neutral or negative impact on performance. Regardless of their performance effect, they have some functions for the organization: they are repositories of organizational memory, they represent a truce in intraorganizational conflict and they serve as targets for managerial efforts (Nelson e Winter, 1982). They are usually stored as procedural memory (Cohen e Bacdayen, 1994), thus less explicitly accessible and less easy to transfer to novel circumstances (when compared to facts, propositions and events, which are stored as declarative memory).

The idea that routines are unchanging, completely automated patterns of behavior started to be challenged in the last decade. Gersick and Hackman defined routines in the context of task-performing groups as "a functionally similar pattern of behavior in a given stimulus situation without explicitly selecting it over alternative ways of behaving" (Gersick e Hackman, 1990: 69). This definition recognizes that there may be variety in the patterns of behavior – as long as they perform the same function and do not involve explicit deliberation. Pentland and Rueter expanded that view, arguing that deliberation happens: routinized behavior is constrained and enabled by the cognitive structures of individuals and by the physical and social structures of organizations (Pentland e Rueter, 1994). Structure defines the set of possibilities but not the particular sequences we observe, which depend on individual effort and agency. This view was inspired by the work of Giddens, who claimed that routines are not simply repetitive forms of behavior carried out mindlessly but effortful accomplishments (Giddens, 1984). Feldman pushed that view further by showing that the agency component on routines results in an internal dynamics that can promote continuous change (Feldman, 2000). That way, routines are not so stable and mindless as the early definitions may suggest. They create connections between people that allow for the development of understandings about what needs to be done in a specific instance of performing a routine and about the goals of the organization that routines help accomplish, contributing to both stability and the ability to adapt (Feldman e Rafaeli, 2002).

On the empirical side, only recently have we seen detailed studies of routinization processes. Narduzzo et al. described the emergence and diffusion of routines and capabilities in the first two years of a telecom company (Narduzzo, Rocco *et al.*, 2000). Their main conclusion is that routines "are embedded in more complex patterns of action in which interpretation, reasoning, more or less explicit manipulation of mental representations, deliberation, and design take a relevant part" (Narduzzo, Rocco *et al.*, 2000: 47). This gives support to the agency-based conceptualizations discussed above. Edmondson et al. analysed the implementation of an innovative technology for cardiac surgery in 16 hospitals. They conclude that the routine development process involved four discrete steps: enrollment, preparation, trial and discretion (Edmondson, Bohmer *et al.*, 2001). Their focus is on the role of the leaders in the routinization processes, something that had not been explored in previous studies.

In short, comparing the various perspectives discussed here, some conclusions may be drawn about organizational routines. They are behavioral patterns resulting from learning processes that perform rather stable functions for the organization. They are developed locally

and involve some effortful accomplishments from the members performing them. I will be using these characteristics as the departing point for my study, a kind of ‘working definition’ that will be further explored as I describe my data. What is still missing in the literature is a better definition of the forming mechanisms of routines, especially the link between learning processes and routinization. One possible way to analyse routine formation processes is through institutional theory; I discuss that below.

### **Routinization as Institutionalization?**

The definitions of routine presented in the last section bear similarity to the concept of institutions from the organization theory literature. Interestingly, most works on organizational routines do not refer to or apply the logic of institutional theory. On the other hand, some authors coming from the institutional tradition have made references to routines. Through the study presented here, I will explore further these possible links between the two streams.

The more general definition to the term institution is “some sort of establishment of relative permanence of a distinctly social sort” (Hughes, 1936: 180). Institutional theories are usually divided into ‘old’ and ‘new’, a distinction made explicit by DiMaggio and Powell. In their words, “old and new institutionalisms identify different sources of constraint, with the older emphasizing the vesting of interests within the organization as a result of political tradeoffs and alliances, and the new stressing the relationship between stability and legitimacy and the power of common understandings that are seldom explicitly articulated” (DiMaggio e Powell, 1991: 12). Despite the differences, there are claims that the two views can be reconciled because they complement well each other – one more concentrated on individual actors, the other on institutional structures (Selznick, 1996; Hirsch e Lounsbury, 1997).

Scott proposes three pillars that constitute the vital ingredients of institutions: regulative systems, normative systems and cultural-cognitive systems (Scott, 2001). Regulative systems involve the capacity to establish rules, inspect others’ conformity to them, and, as necessary, manipulate sanctions in attempt to influence future behavior. Normative systems include both values (conceptions of the preferred or the desirable) and norms (legitimate means to pursue value ends) that vary according to roles, and they introduce a prescriptive, evaluative and obligatory dimension into social life. Cultural-cognitive systems stress the shared conceptions that constitute the nature of social reality and the frames through which meaning is made (Scott, 2001). These perspectives have been developed by different authors, and Scott treats them as separate mechanisms for institutional processes. But, as in the case of the division between ‘old’ and ‘new’ institutionalism, there are claims that these perspectives can be put together because they are complementary and, together, they can explain more about institutional processes (Hirsch, 1997).

Although institutional theory has not focused much on intra-organizational processes (Tolbert e Zucker, 1996), there are some strong links between institutionalism and the research on organizational routines. Going back to Berger and Luckman, their definition of habituation encompasses many characteristics associated with routine formation: “Any action that is repeated frequently becomes cast into a pattern, which can be reproduced with an economy of effort and which, *ipso facto*, is apprehended by its performer *as* that pattern” (Berger e Luckmann, 1966: 53). Zucker departed from this concept to explain processes of institutionalization and the cognitive processes involved in the creation and transmission of institutions (Zucker, 1977). For her, the process of creating routines is largely independent of skill level and much more directly related to the degree of institutionalization (Zucker, 1987a). Organizational routines increase institutionalization within a given organization as a function of (a) the degree of explicit codification of the specific routine; (b) the length of the history of the structure/task; and (c) the degree of embeddedness in a network of

structures/tasks (Zucker, 1987b). Routines can then be seen as one of the carriers of institutions (Scott, 2001), and their formation involves processes of habitualization (defined above), objectification (development of some degree of consensus) and sedimentation (perpetuation of structure over a lengthy period of time) (Tolbert e Zucker, 1996).

## **METHODS**

Given the tacit and socially embedded character of routines, one of the most appropriate ways to study their development in a real organizational setting is through a longitudinal, in-depth observation process where the researcher is immersed in that specific cultural setting. Ethnography suits well this purpose, allowing for observation of emerging patterns of interaction and organizational practices (Sanday, 1979; Van Maanen, 1979).

I developed an ethnographic study of the initial period in the life of an automotive plant, with the overall aim of observing the evolution of organizational routines and capabilities. I stayed an average of 4 days a week in the plant for a period of one year. Total time spent in the field was roughly 2000 hours. Before the period spent in the specific setting, I did a set of 45 interviews in 3 companies. These interviews were aimed at 1) building relationships with the companies, 2) gathering information to select the most appropriate site and 3) having a view from managers on what would be the capabilities they wanted to develop in the new plants. I then selected one company, did some further interviews in their headquarters and started my ethnography in the new plant. During the first weeks I interviewed fifteen managers from different areas. Soon I started to follow some meetings across the organization, especially the daily production meetings in two areas: body shop and assembly. I was also doing observations and informal interviews in production areas. After two months I started to follow one assembly line ever since the day they produced their first car. From then on, I spent around 60% of my time doing observations and the remaining 40% following managerial meetings and doing informal and formal interviews. My field notes add to 4000 pages. They comprise facts (e.g. who was doing what at what time in the assembly line), interpretations (spontaneous or induced reactions people had at specific events), meeting notes, informal and formal interviews, and my own reactions to the events I was witnessing. I also collected company documents and performance data (production and quality levels). After three or four months in the field, I started working more closely with three informants: one shop floor worker, one production manager and one member of the human resources staff. They provided me with many interesting stories, helping me to reconstruct things I was not able to observe directly.

The coding process was similar to the one suggested by Glaser and Strauss (Glaser e Strauss, 1967), but with more attention paid to contexts (given that grounded theory is more focused on concepts, regardless of specific contexts – see Stewart, 1998). I started a very general coding looking for some patterns in my data, and the two initial categories that emerged from that were ‘replication’ and ‘adaptation’. So I started coding the data based on these two broad categories. I developed one initial model then went back for more specific coding focused on the mechanisms behind those two general processes, while I did some further literature review. As the model was close to institutional theory, I went back to that stream of literature, and discovered many interesting issues there that could help in my work. I also looked at works on routines, identity, learning, adaptation, improvisation, all issues that were related to my data. Then I started to interpret my coded data based on what I had found on my literature review. The process went on in loops of data coding and interpretation and literature review.

## **THE STRUCTURATION OF ORGANIZATIONAL ROUTINES**

The development of routines was a process driven both by structural features imposed by the parent organization and emergent patterns of interaction among organizational members. There is one theoretical approach that encompasses these two elements to explain social action: the structuration theory proposed by Giddens. He sees social structures as dual elements that are “both the medium and the outcome of practices they recursively organize” (Giddens, 1984): 25). As explained by Scott, “structuration theory views actors as creating and following rules and using resources as they engage on the ongoing production and reproduction of social structures” (Scott, 2001: 76). For Giddens, structure evolves from the interaction of two realms: the institutional (general principles that constitute systems of signification, domination and legitimation) and the realm of action (actual arrangements of people, objects, and events). The institutional realm imposes constraints on actions but it is also modified through actions. This theory brings a process view that is missing in most institutional studies, which have emphasized the conception of institutions as entities, not as processes (Tolbert e Zucker, 1996; Scott, 2001).

Figure 1 brings an overall view of the process of routine development in the plant using this structuration perspective. The institutional realm was composed of the general principles coming from the parent organization in form of rules, values, structure, artifacts, and what the members of the parent organization regarded as legitimate modes of interaction. These elements were initially imposed on the realm of action through regulative and normative mechanisms (part A in the figure); some of these elements were put into practice by members without major changes (B); many were re-created locally (C). These re-created practices slowly matured until the point where they were dissociated from the particular actors and became part of the institutional realm (D); this new institutional structure was legitimized (E) and, together with some elements that were already habitualized, it resulted in new patterns of action that were then spread throughout different groups within the organization (F). One can expect (and there were already some cases in my study) that some of these patterns of action will later be modified to adjust to new circumstances or create new features for the organization (G).

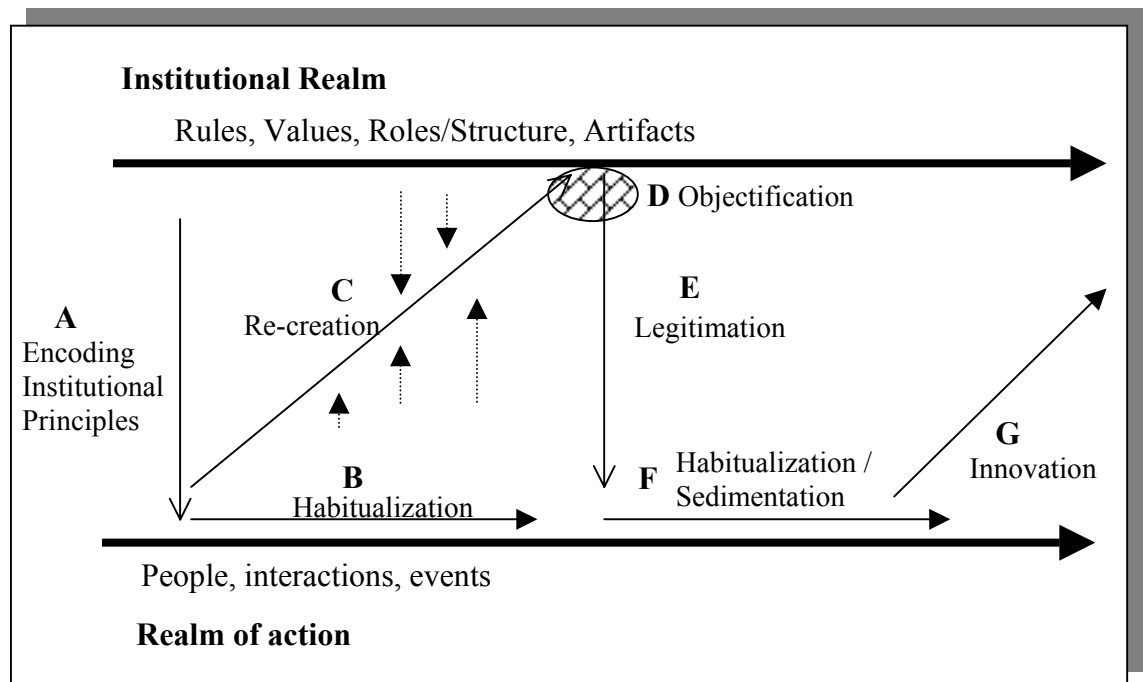


Figure 1 – The Structuration of Organizational Routines

### **Phase A: Encoding institutional principles**

Once upon a time there was one institutional realm. At least the intended one. The group of employees who had developed the project of the new plant back in their home country went to the new country to set up the structure they had designed. They had a set of rules and documents, they brought with them the values of the company and their task now was to make things happen in the new country. Of course this institutional realm was the result of the history of the company, their actions, objectives and beliefs. But at the host country, this was the departing point – before any action, there was already a set of institutional elements that, in the eyes of the company, should be the guiding principles for the new plant. In my preliminary interviews at the company's headquarters one year before the plant opened, managers made many references to these guiding principles (see table 1 for evidence coming from interviews and observations for each of the phases).

As local employees were hired and trained, the process of routine development started. The initial period involved socialization and training at the specific areas they would work. Some went to plants abroad, some were trained locally by expatriates. This is similar to what Barley and Tolbert have called “encoding” of institutional principles (Barley e Tolbert, 1997), which involves an individual internalizing rules and interpretations of behavior appropriate for particular settings.

This encoding was done through different mechanisms depending on the area within the organization. In general, most mechanisms fell into the regulative and normative categories. At the shop floor in assembly, there was an emphasis on procedural rules – workers had to read documents over and over and apply what was there. At the production management level, encoding rested mostly on values and tacit rules – most people were sent abroad so that they could, through observation and practice, internalize values and norms attached to the roles they would perform in the new plant. At the body shop, rules, values and norms played a role, but institutional principles were also encoded in the technology: machines forced operators to engage in the patterns of activity that were planned by the engineers previously; there was less space for deviation from certain rules than in assembly, where the flow was dictated not so much by machines but by the skill of workers.

Encoding was not completely successful in the eyes of expatriate managers working in the plant, and they tended to view that negative outcome as resultant from cultural differences. Throughout my whole period there I heard complaints about local people not having the same behavior as their counterparts in plants abroad, and at my departing interviews all expatriate managers mentioned that locals were not following rules as they (the managers) expected. But by the time I left the plant, operations were being carried out quite successfully and people had developed some recurring patterns of behavior, so it is hard to argue that encoding did not happen – it did, but in a different way from the expected by top management. It certainly took some time to develop: internalization of rules and interpretations of behavior happened mostly at the legitimation and sedimentation phases that will be explored below. During this initial phase, encoding was partial due to two main reasons: first, there were far too many rules and norms to be internalized, so members faced some cognitive limitations to absorb so much new knowledge. To aggravate that, some rules were not written or specified in any form. The second problem is linked to the tacitness of some of the knowledge being transferred: expatriates (or colleagues at foreign plants for those who went abroad) could not transfer part of their knowledge easily, especially issues regarding “appropriate” behavior, because they did not know exactly the rules concerning that – these issues were just part of the taken-for-granted assumptions of the environment where they worked. This might explain the constant comments I heard from both sides: expatriates complaining that locals “just do not take actions” and locals complaining that expatriates “do not teach us what to do”. Expatriates expected locals to adopt taken-for-granted behavior

patterns like their colleagues did in mature foreign plants, but locals had had neither the time nor the guidance to develop those behaviors.

### **Phase B: Developing habits**

With the start of operations, some practices were absorbed and evolved into habits while others had to go through re-creation processes. Those that evolved into habits had one or more of the following characteristics: they were usually simple practices, well-documented and did not involve interaction among many areas. For example, many single activities in the shop floor quickly became habits – even with constant changes in the sequence of activities in the line, getting used to a single activity would take no more than a week.

This phase corresponds to what Berger and Luckmann called habituation, where actions that are repeated frequently become cast into a pattern that can be reproduced with economy of effort (Berger e Luckmann, 1966). These actions still do not have a more permanent and widespread status, corresponding to a pre-institutionalization stage. But they were already shaping local routines. The development of these habits involved basically experiential learning – as people did more of the same, they got better and developed patterns to facilitate their activities. But, as they did their activities, organizational members also found some problems that they did not how to solve. The usual answer to those problems was in the form of improvisational learning. Prior research has indicated that external time pressures coupled with lack of relevant prior routines are a common trigger for improvisation (Miner, Basoff *et al.*, 2001). That was exactly the case at this initial period, where strong production pressures and the absence of routines made people improvise solutions to new problems. According to Miner, Basoff and Moorman, improvisational learning is based on real-time experience and serves to solve surprising problems; there is little automatic reflection because the focus of the action is to get the problem solved and the knowledge generated is idiosyncratic (Miner, Basoff *et al.*, 2001). As a result, the long-term retention of learning outcomes is low. One example to illustrate that: the robot that distributed the primer (material for adherence) over the windshield sometimes released more material than necessary, causing spillovers when the windshield was attached to the car. One engineer suggested using a potato cut in half to clean the excess material from the windshield before attaching it to the car (the potato absorbed the material). They tested the solution and it worked. The assembly manager asked people to bring potatoes to the factory every other week and leave them with the worker that attached the windshield to the car. So the local routine of one worker (attach windshield to car) was changed when they faced a problem (spillovers), but the solution was idiosyncratic (potato) and did not involve more complex learning efforts that could be applied to future problems (for example, solving the problem with the robot – that was discarded because it could take long and be expensive compared to the potato solution).

During these processes of experiential and improvisational learning, however, people sometimes faced problems they could not solve easily and that required more substantial change in their practices. For example, each time the balancing of the line changed there were problems in the delivery of parts to the line. Members were aware of this problem, created some improvisational solutions (like a new report from production to parts delivery), but even so the problem repeated itself. So the problem was discussed in more detail during the meetings and processes of re-creation of the practice started – members had to redesign the whole delivery process. In the model, this phenomenon is represented by the arrows that link phase B to phase C. Some habits that did not need re-creation in the beginning faced later some problems that forced them to go through re-creation. So the main trigger of the passage of some practices from a more advanced stage of B to C (from habituation to re-creation) was unsolvable problems found as simple routines were performed.

Some of these practices habitualized early in the evolution of the plant became stable routines after some time. For example, some shop floor practices could not be changed even after foreign workers came to the line and showed local workers better ways of doing activities. Workers kept on doing things as they did because they were used to the activities and because they had internalized the value of not deviating from what they did unless they were told to do so by their bosses. These routines developed during phase B were local, usually skill-based, related to a single member performing one or a few activities. More complex routines (e.g. those linking different areas and groups or those involving several different activities) either went through re-creation or could only become stable patterns of behavior performing specific functions after other routines on which they were dependent were objectified and legitimized (i.e. after phases D and E). That was the case, for example, of the routines for the whole 12-minute cycle of operations for each worker. Although individual operations were routinized quite early, the constant changes in balancing and pacing made it difficult to routinize the whole cycle. That only became possible when more complex routines of production management were developed and brought stability to the flow and organization of production.

### **Phase C: Re-creating Practices**

Re-creation of practices involved several processes of knowledge sharing aimed at improving the activities that had been planned by the company. While there were many practices that had to be re-created after facing unexpected complex problems during habitualization, there were also other triggers for re-creation of practices. They included failures in the regulative/normative processes (referring to phase A of the model) or failures / ambiguity / unexpected events in the habitualization processes (phase B). Among the failures in phase A, there was absence or incompleteness of some rules; lack of documents; and poor transfer of values and norms. In phase B, apart from the unexpected problems mentioned in the last section there were also lack of proper means for operations (especially tools), ambiguities regarding roles and rules (something related to the problems in phase A), bad relationships between expatriate and locals, strong dependence on some key players to solve problems, multiplicity of demands (i.e. different areas asking for conflicting things). Some of these problems triggered re-creation at very early stages of habitualization because they did not allow activities to be carried on regularly – for example, with missing tools operations could not be performed as planned so they needed to be redefined.

Most initial attempts at redefinition were provisory ‘quick fixes’, but some of them became long-term solutions because the root problem was never solved. For example, some weeks before the first ISO-9002 audit they discovered that some essential procedures were still not being followed at the line, most of the time because the documents regarding those procedures were not translated yet, or not adapted to the specific flow of assembly at the plant (the plant was similar, but not equal to others – most procedural documents needed some revisions). So there was a concentrated effort when members wrote many procedures based on what workers were doing at the line, subject to the plant’s overall quality norms. Workers knew what to do based on their training period abroad (and on the so-called ‘illegal documents’ that line managers brought with them from the foreign plants), but the quality norms there were a bit different from the ones in the local plant. The resulting ‘official’ procedures represented a compromise between these action-based learning from workers and the local norms. They were supposed to be a quick fix for the audit, but they ended up becoming the official procedures in many cases.

I am using the general label ‘re-creation’ but there were different degrees of re-creation. In some cases practices were created from scratch, in other cases some major characteristics of planned practices were changed, or yet some minor adaptations were made.



Common purposes were to reduce ambiguity by making a procedure more explicit, to set new roles and patterns of interaction or to adapt practices to local characteristics. Regardless of the amount of recreation involved and its purpose, there were some common learning processes during this phase: interpreting, experimenting and integrating.

I am borrowing the concepts 'interpreting' and 'integrating' from Crossan, Lane and White's model of organizational learning (Crossan, Lane *et al.*, 1999) because they fit very well with what went on during this phase. Interpreting is defined as "the explaining, through words and/or actions, of an insight or an idea to one's self and the others". Integrating is "the process of developing shared understanding among individuals and of taking coordinated action through mutual adjustment" (Crossan, Lane *et al.*, 1999: 525). For the authors, these are the two main learning processes at the group level. My data suggests there was usually another step linking interpreting and integrating, which I labeled "experimenting". This was a step where members tested some general hypotheses through actual trial-and-error processes or through thought experiments during their discussions (generating 'what if...' statements and discussing based on the expected outcomes, in a process similar to the one discussed by March, Sproull and Tamuz (March, Sproull *et al.*, 1991)).

This process of re-creating practices happened mostly during the daily production management meetings, which was the main gathering locus for all areas related to production. It is important to point that, although the re-creation phase involved emergent understandings and beliefs, it was also constrained by the institutional realm – members could not deviate from certain ways of doing things. The general pattern of re-creation of practices went as follows: it started when one area brought a problem to the meeting. The area had to explain and detail the issue so the other areas could understand it; all areas concerned then explained how that issue affected their areas. This was the beginning of the interpreting stage, which sparked the generation of some ideas to solve the problem. Similar to what has been suggested by Daft and Weick (Daft e Weick, 1984), the process continued through shared observations and discussions until some possible causes were identified and courses of action suggested. The process was not without conflicts: before the start of interactions, members had developed their cognitive maps within their areas, and sometimes there were differences among those maps – relating to previous research on the topic, there were different department thought worlds that caused interpretive barriers (Dougherty, 1992). These differences were solved through bargaining or experiments. When a possible cause for a problem could be easily tested, they would usually go ahead and test it, and the results would bring a definite answer or spark more discussions (when the experiment did not support the cause under test). When real experiments were not possible, they would try to do some thought experiments and negotiate a course of action based on these experiments. That helped members achieve the integration of knowledge that led to coherent, collective action.

This re-creation phase was very important in the routinization process. First, through this phase members progressively adjusted their cognitive maps and developed a shared understanding of cause-effect relationships in production. That brought cognitive elements that complemented the normative and regulative processes developed at phase A and facilitated routinization of activities. Second, re-creation helped to create or mature connections among areas, an important pre-condition for more complex routines – if behavioral patterns are to be developed among areas, having stable connections is a necessary step. The third important characteristic of the re-creation phase was that the sub-phases discussed above (interpreting, experimenting, integrating) consisted themselves a routine to generate/alter practices – a kind of meta-routine that allows change and innovation. By solving problems they were not only solving the problems but also learning to solve problems. And local members learned some ways to convince expatriates or centers of expertise about their needs for changes.

### **Phase D: Objectifying Practices**

Objectification is not itself a separate process, but the final outcome of the re-creation phase discussed above. According to Tolbert and Zucker, “objectification involves the development of some degree of social consensus among organizational decision-makers concerning the value of a structure, and the increasing adoption by organizations on the basis of that consensus” (Tolbert e Zucker, 1996). What was once a shared meaning in a group becomes something objective, a reality experienced in common with others (Berger e Luckmann, 1966).

Objectification was the result of the increasing consensus achieved through sharing of knowledge and negotiations. But it also involved some kind of formalization – for example, the development of a new report or written procedure. These formalization processes required the input from expatriates or from centers of expertise abroad, so locals needed to justify to these decision-makers why that practice should be done in a different way from the planned. In most cases justification was part of the problem-solving process described above, not a discrete event in the end. Interaction with expertise centers or expatriates happened as members discussed and selected possible courses of action, so that was part of the selection of alternatives (ideas rejected by expatriates were not discussed anymore).

Through the objectification process, the re-created practices became embedded in the institutional realm. That involved the creation of new rules or modification of existing ones, new roles and new artifacts. Norms and values were not touched upon – any attempt to change those was blocked by expatriates. During this process, process quality members got an increasingly prominent role at meetings – after all, they were the people responsible for managing the process of turning most of the discussed practices into ‘official’ decisions. That involved the use of a document called ‘deviation’. For each practice that needed modification, a new document was issued authorizing a provisory action and triggering the search for solutions. That document was considered “open” until a solution was found and put into practice (in 20% of cases the provisory solution was accepted a final solution after some studies; the remaining 80% involved solutions that were different from the provisory ones). In the model that I propose here, an “open” deviation means that the process is at the re-creation phase; a closed deviation means objectification was reached. The section below on the dynamics of the process will show the evolution of open and closed deviations to suggest the evolution of objectification through time.

### **Phase E: Legitimizing New Routines**

The new institutional realm resulting from the objectification of re-created practices still needed to be translated back to the realm of action. In other words, the new rules, roles or artifacts had to be put into practice at the shop floor and supporting areas. So there was a new mechanism of ‘encoding’, but this time a more focused one – the intention was not to rebuild the whole system of values, but to implement the specific changes or new procedures that had been developed.

This process corresponds to what Berger and Luckmann have called “legitimation”. For them, legitimation “explains the institutional order by ascribing cognitive validity to its objectivated meanings” (Berger e Luckmann, 1966: 93), and it has both a cognitive and a normative element. It started during meetings, when the solution to a problem was announced. Depending on the solution, there would be different paths to implement it, but most involved some formal or informal training of the group who performed the activity concerned. Many times the people responsible for the implementation (usually quality area members or line managers) would face resistance from the group, especially if the person was seen as an ‘outsider’ – for example quality members faced that problem on the shop floor. Overcoming these implementation barriers involved a lot of argumentation. In order to convince colleagues

or subordinates to adopt certain practices, people would usually make reference to past problems and try to identify themselves with the group that would adopt the practices – for example, when one engineer was presenting a new operation to a group he started like that: “remember that problem that has been happening for ages? After your input we looked for causes and now we finally found a solution... it was hard, we had to get approval from abroad, but they finally let us things differently!” If arguments like that did not work, they could always use some threats as well.

One example of this legitimation phase was the introduction of a system to check hidden torques (torques in parts that had difficult access and thus could not be checked at the end of the line – checking had to be done on the spot, especially if the part was related to safety features). Given the torque-related problems they faced during the first few months of production, the quality area decided that there should be more checking steps done by operators to assure the quality of critical operations. Deciding the new procedures took some weeks of heated discussions during production meetings. When a consensus was reached and the procedures were written down and approved, they had to communicate that to operators and make them follow the new procedures. This process involved a 1-hour lecture about the new system delivered by people from quality and production. They taught the new rules but also stressed the whole time the importance of that system for the safety of customers – in that process they transferred knowledge but also values attached to the practice: “it is not a simple checking, it may be a matter of life and death for our customers!” The system was not easy to grasp, so in the initial weeks a quality supervisor followed the practices closely.

These legitimation processes were similar to the initial encoding, but now they were completely done by local employees, who had participated in the re-creation of practices and who were closer to the groups where these activities were performed. That way, explaining the institutional order was easier and that provided a basis for the sedimentation of practices that finally resulted in more stable patterns of behavior.

### **Phase F: Sedimenting New Habits**

Sedimentation is the last step in the structuring of routines. According to Tolbert and Zucker, “sedimentation is characterized both by the virtually complete spread of structures across the group of actors theorized as appropriate adopters, and by the perpetuation of structures over a lengthy period of time” (Tolbert e Zucker, 1996: 184). In the plant under study, this process was preceded by some habitualization: after new practices were legitimized, members put them into action and through repetition they became patterns of behavior. During this second process of habitualization, new or re-created practices were added to those that had already gone through habitualization during phase B, paving the way for a more widespread sedimentation that included both simple and complex practices.

One important thing to point out is that many members joined the company at this stage, especially shop floor workers (there were monthly ‘waves’ of new hires). These people were socialized by their local counterparts, so their encoding of institutional values already happened based on the objectified, re-created practices. That way, for this group of people routinization involved legitimation, habitualization and sedimentation – phases E and F. Given that practices were much better defined and many of the initial failures had been addressed and solved, routinization happened faster for these people – as it was the case of the introduction of a second shift in line 1. Results there were much better than expected by expatriates, and in two weeks the second shift was as productive as the first one.

### **Phase G: Innovating**

This phase involves the creation of new alternatives that will renew routines. It can be triggered by internal dynamics (e.g. discoveries of better ways of doing things, introduction of

new products or processes) or by external processes (e.g. radical innovations coming to the market, new cost-saving practices adopted by competitors). During the first year of the operation of the plant there were very few processes like that, but one can expect that, as the organization matures, it will increasingly go through innovating processes.

The few examples of innovation in routines came mostly from the body shop. There were many routines there that got to the sedimentation phase quite early, and the introduction of a system for suggestions by the local manager fostered workers' interest and involvement in the process of innovating. The difference from the re-creating phase is that changes were not being proposed because failures or ambiguities made it impossible to develop routines; rather, routines were already developed and workers saw ways of improving them. Changes suggested were usually linked to the way one operation was performed, so what was being put into question were local, single routines – not the more complex ones that linked different areas. Sometimes they brought important savings (as when one operator proposed a new way of doing an operation that cut its time by half), but the major linkages developed previously were not being challenged.

## **CONTRIBUTIONS TO THEORY AND PRACTICE**

There are different implications for the theories on organization routines. The more general one is the use of institutional theory to understand routinization processes. Institutional theory is concerned with topics such as stability of structures; the role of rules, values, conventions and habits in driving behavior; diffusion of practices – all these topics are central to the understanding of routines. By studying routines under an institutional perspective, one can understand better the mechanisms behind routinization. Although institutional theory has not focused much on internal aspects and on processes of institutionalization, the theory can also be applied to such topics. That way, the contribution goes both ways – institutional theory can help understand the roots of routines, and the study of routines through institutional lenses expands the theory into a territory that has been under explored.

Following this institutional approach to understand routines, one interesting thing suggested by the study is the interplay between regulative, normative and cultural-cognitive mechanisms in the process of routinization. These three elements have been addressed separately, and some see them as competing alternatives to explain institutionalization. Based on the discussions of this paper, all three mechanisms are important to understand routinization – this would give support to Hirsch's claims that the three perspectives are in fact complementary (Hirsch, 1997). In fact, the process I studied suggests that, more than complementary, the three kinds of mechanisms are necessary for routinization. Initially the company relied on regulative and normative mechanisms only, but these were not enough to make locals develop the behavior patterns that the company expected them to develop. Routinization happened only when locals developed internal interpretive processes that allowed for a common framework of meaning. With that, rules and norms took a new significance for locals: from external pressures to conformity they became internally generated frames for action. The cognitive processes helped change regulative and normative mechanisms from constraints to enablers for action.

A more specific contribution is the model to understand the process of routinization. The model adds to recent studies on formation of routines (Feldman, 2000; Narduzzo, Rocco *et al.*, 2000; Edmondson, Bohmer *et al.*, 2001; Feldman e Rafaeli, 2002) by detailing the interplays between the institutional realm and the realm of action, something that had not been explicitly addressed before. Routines can be seen as the carriers of institutional elements at the realm of action. Similar to what has been described in these recent studies, agency played

an important role in the shaping of routines – in other words, the realm of action, comprised of people, actions and events, had an active role in routinization. The study also supports the view that routines make connections between people. This argument has been recently brought forward by Feldman and Rafaeli, and deserves a brief discussion. In their view, “routines make connections that enable shared understandings about what to do in a particular instance and why some actions are appropriate” (Feldman e Rafaeli, 2002: 311). My study suggests that this is one important role of routines, but during the formation of routines the logic is basically the reverse of the one suggested by Feldman and Rafaeli: shared understandings make connections that enable routines. Of course that, as routines get sedimented later, they will become the main mechanism keeping most connections. But it is important to keep in mind that these routines are not structural elements that exist independently of the actors performing them – they are there because they have been developed by people; they make connections because they have been formed through connections created by the interaction of people.

The major contribution to the literature on knowledge and practices transfer regards the characteristics of the ramp-up phase of the transfer. What was intended as a straightforward process of replication of routines ended up as a mixture of replication and recreation, where members were developing and assembling routines as they learned to assemble cars. Even though local routines departed in many cases from what expatriates expected, the processes that supported their development were quite important to build up local knowledge on how to produce cars. As suggested by a number of organizational researchers (e.g. Zander e Kogut, 1995; Weick e Westley, 1996; Orlikowski, 2002), some types of knowledge must be developed socially through ongoing interactions. This is the case of knowledge linked to action, which is an essential part of organizational routines. That way, the adaptation and re-creation processes did not constitute ‘noise’ in the replication of routines, but a necessary step to develop knowledge bases that later became embedded in the routines. This is quite a departure from traditional studies on transfer/replication of practices that, while acknowledging that some local adaptations will be done, propose mechanisms to make replication more effective such as knowledge codification (Zander e Kogut, 1995), decrease in causal ambiguity (Szulanski, 1996), or the development of a template (Winter e Szulanski, 2001) – mechanisms that will reduce the recreation activities at the place where practices are being transferred to.

I do not want to claim that organizations should not strive to achieve accuracy in replication; I recognize that many organizations (e.g. fast-food chains, hotels, banks) have accurate replication as a core requirement for success (as discussed by Winter e Szulanski, 2001). What my study suggests is that, to achieve the desired routinization of practices at the recipient sites, recreation plays an important role during the ramp-up phase of the transfer. They constitute windows of opportunity (as discussed by Tyre e Orlikowski, 1994) that enable the development of knowledge linked to action. That way, managing re-creation is key to replication – inhibiting it will lead to poor learning and routinization of practices.

The first contribution to practice relates to the argument that the ramp-up phase is the most crucial one in the transfer process. That way, instead of spending a lot of organizational resources on activities before the ramp-up phase such as codification of knowledge or training of new members, which aim at high accuracy *ex ante*, managers should spend most of their resources in managing the re-creation processes locally. Accuracy is better achieved through *ex post* mechanisms – in short, guaranteeing that the cognitive aspects developed locally do not diverge from the main regulative and normative principles that the organization wants to see in the new setting.

The other interesting issue related to the practice of knowledge transfer is the role played by failures and ambiguity: they were the major triggers for re-creation. Of course, I do

not want to go as far as to claim that failure should be an objective of managers so that these local processes can happen. What is important is that companies have to explicitly recognize the value for local re-creation, mimicking the effects that failure played in this context – in other words, they should not start the process with everything in place, but involve locals early on and make them part of the structuration of the new setting. Interpreting, experimenting and integrating have to be done locally as organizational members interact.

### Going forward

This paper gives support to the different views that claim that adoption of practices requires a form of reinvention (e.g. Brannen, Liker *et al.*, 1998; Nooteboom, 2000; Orlikowski, 2002). Its main contribution is to detail this process of reinvention, showing how a set of rules, values and cultural-cognitive elements get institutionalized in a new setting.

The model presented here can be further explored in different ways. First, one important issue that I cannot answer with my study regards normative implications: what is the best way to manage this process? Comparative studies are needed to answer that question. Another important question regards the role of failures and what to do with them. The study showed that, although they hindered the evolution of performance in the plant, failures also triggered important learning processes. Most of management literature concerns how to prevent failures; we maybe should also focus on how to get the best out of those failures that cannot be prevented or that are too costly to prevent.

In conclusion, this study is a first step towards a better understanding on how routines get formed. By detailing the processes of transfer of routines and the links between learning processes and routine formation, the paper also advances the understanding of replication practices and highlights the importance of the ramp-up phase of the transfer. It opens two related ‘black boxes’ – one of routines, one of transfer. But there is still a lot in there to be explored.

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