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VIRTUAL COMMUNITIES: HOW
INSTITUTIONAL CARRIERS INFLUENCE
ONLINE GOVERNANCE STRUCTURES

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THE INSTITUTIONALIZATION OF VIRTUAL COMMUNITIES: HOW INSTITUTIONAL CARRIERS INFLUENCE ONLINE GOVERNANCE STRUCTURES

Full Paper

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1 Abstract

This research investigates how institutional carriers – from rules and power systems to cognitive schemas and information technology – influence the reproduction of centralized decision-making governance structures in virtual communities. Studying a group of four virtual communities, the findings show that community members invoke a variety of institutional carriers in order to try to legitimate actual centralized governance structures, which contradict their stated intentions of building decentralized decision making. The research illustrates in the micro-level how an institutionalized social structure is seen as meaningful by social actors in spite of being the opposite of what community members would rhetorically defend. The study explores how institutional carriers become sanction and legitimating mechanisms, which influence the reproduction of institutionalized behavior in virtual interactions, concluding on the relevance of understanding the institutional context to make sense of behavior patterns, which emerge from interactions in online environments in general and virtual communities in particular.

Keywords: virtual community; governance structures; decision making; institutions; institutional carriers.

1 Introduction

The centralization of decision making is a pervasive institution in hierarchical organizations (Simon, 1997 [1945]). Some virtual communities reproduce this social structure, whilst others enact models which resemble more participatory democracy structures, in which all members could participate in decision making (Graham, 1999; Jones, 1995). However, some authors question whether one can find an actual example of a network organization considering the pervasiveness of hierarchical organizations in contemporary societies (Courpasson and Reed, 2004). Starting from the perspective that virtual communities may adopt centralized or decentralized decision-making process, this research investigates how the institutional environment influences governance structures in virtual communities.

Reviewing the literature on virtual (online) communities, few studies focus primarily on the influence of institutions in such online collectives (Hercheui, 2011); for instance, how institutions influence the emergence of norms in online communities (Matzat, 2004) and how groupware tools institutionalize the governance mechanisms of virtual communities (de Souza et al., 2004). This research thus contributes to filling this gap in the understanding of the influence of institutions in virtual environments.

From an institutional perspective, organizational identities, structures and activities result from institutionalized patterns, which determine the validity of types of organizations, their appropriate structural forms and legitimate activities (Meyer and Rowan, 1977; Scott and Meyer, 1994). Organizational structures are not only the product of private actors, guided by individual-rational choice and interests (neoclassical economics), but also the product of societies which provide resources for legitimate organizational patterns (Jepperson and Meyer, 1991; March and Simon, 1993 [1958]; DiMaggio and Powell, 1983, 1991; Meyer and Rowan, 1977).

A perspective to understand the influence of institutions in the structuring of organizations is to observe the role of institutional carriers – such as rules, norms and cognitive models – as vehicles and repositories of institutionalized features (Scott, 2001). Weber (2002 [1930]) introduced the concept of institutional carrier proposing that social strata, groups and organizations were responsible for the diffusion of religious values through societies. DiMaggio and Powell (1983) associate institutional carriers, such as legislation, to institutional isomorphism, i.e. the reproduction of similar social structures through settings. Many scholars have explored the role of legal systems, organizational models, professionals, universities, science, media, and technology as institutional carriers (DiMaggio and Powell, 1983; Kraatz and Moore, 2002; Scott, 2001, 2008).

Investigating the diffusion and reproduction of institutions, Scott (2001) proposes a framework with twelve categories of institutional carriers. This research draws upon this framework, proposing to contribute to the theoretical understanding of the role of institutional carriers in the reproduction of institutions in virtual environments. Scott's framework is chosen because it is a generic classification that may be applied in diverse environments. Other studies on institutional carriers have centered in particular cases, without providing a categorization that could be generalized to other situations.

This study explores how institutional carriers influence a group of virtual communities, understood as informal, voluntary organizations, in the reproduction of centralized decision making. As these communities interact mainly through Internet-mediated channels, the settings offer an opportunity to understand how centralized decision making is reproduced in online environments; and the influence of institutional carriers in this reproduction. This study thus may inform other researchers who investigates governance structures in virtual teams, collaborative environments, and all sorts of communities.

Although focusing on institutional carriers, which highlight the role of social structures in the reproduction of institutions, this study does not exclude agency from this process. Indeed, some authors criticize institutional theory for focusing on social structures instead of agency. However, this criticism

comes from a limited view of institutional theory. Agency is clearly important in the creation, diffusion and reproduction of institutions, as people are permanently making choices about reproducing or changing social structures (DiMaggio and Powell, 1991; Douglas, 1987; Jepperson and Meyer, 1991; Scott, 2001). On the one hand, social structures influence agents in the reproduction of institutions, but on the other hand social structures depend on agency to be reproduced or changed (Scott 2001). This research copes with this permanent interplay between agency and social structures, focusing on the micro-level reproduction of an institutionalized structure (Powell and Colyvas, 2008), to explore how social actors invoke institutional carriers in order to build and explain the governance structures of their virtual communities.

This article develops as follows. First, it introduces the theoretical framework of institutional carriers. Second, it presents the methodology and empirical objects of this investigation. Third, it describes the findings. Fourth, it discusses the findings through the lens of institutional theory, clarifying the theoretical insights the study brings to the surface. Finally, the article outlines the theoretical and empirical contributions of this investigation, and suggests further research.

2 Institutional carriers

This study understands institutions as resilient social structures, i.e. social patterned behavior that diffuse through settings (Berger and Luckmann, 1967 [1966]; Scott, 2001). When typified actions are repeated through time, they become institutions (Berger and Luckmann, 1967 [1966]). Institutions influence social actors, fostering the reproduction of patterned behavior. The main institutional channels of influence on human behavior are regulative and normative systems (rules and norms), and cultural-cognitive systems (models, scripts and schemas) (DiMaggio and Powell, 1991; Scott, 2001; Scott and Meyer, 1994).

Scott (2001) proposes that institutions are constituted by regulative, normative and culture-cognitive systems. Each of these systems has specific institutional carriers, classified into four groups: symbolic systems, relational systems, routines and artifacts. Institutional carriers influence the diffusion and reproduction of institutions (patterned behaviors). Table 1 presents examples of carriers for each category.

Carriers	Pillars		
	<i>Regulative</i>	<i>Normative</i>	<i>Cultural-cognitive</i>
<i>Symbolic systems</i>	Rules Laws	Values Expectations	Categories Typifications, Schemas
<i>Relational systems</i>	Governance systems Power systems	Regimes Authority systems	Structural isomorphism Identities
<i>Routines</i>	Protocols Standard operating procedures	Jobs Roles Obedience to duty	Scripts
<i>Artifacts</i>	Objects complying with mandated specifications	Objects meeting conventions, standards	Objects possessing symbolic value

Table 1. Framework on institutional carriers (Scott, 2001: 77).

Symbolic systems (rules, values and schemas) are present in the mind as ideas and values; they are simultaneously external to actors and internalized by actors as cognitive frames and beliefs. *Relational systems* (governance and authority systems, and identities) are related to role structures, i.e. patterned expectations people cultivate through being embedded in social networks. *Routines* are patterned actions and procedures (repetitive activities). Lastly, *artifacts* are tangible objects, such as information

technology, which have material specifications but are interpreted and appropriated by people in different ways, depending on conventions and symbolic values associated with them.

The framework has a level of granularity (by category and by carrier) that facilitates the micro-level investigation of institutionalizing processes (Czarniawska-Joerges, 1992). The framework helps revealing how people recall specific institutional carriers to explain the centralized decision making in virtual communities, in which members stated the commitment with decentralized decision-making models.

The diffusion and reproduction of institutions are supported by the perception of legitimacy. In this study, legitimacy is understood as the perception that specific actions are appropriate and meaningful within a social system (North, 1998; Scott, 2001; Suchman, 1995). Legitimacy depends on conformity to formal rules (regulative systems), to moral bases (normative systems) and to taken-for-granted frames of reference (cultural-cognitive systems) (Berger and Luckmann, 1967 [1966]; Deephouse and Suchman, 2008; Scott, 2001). Social actors may conform to institutions in order to obtain legitimacy and thus increase their chances of obtaining resources from society (Meyer and Rowan, 1977).

In addition, institutions depend on sanction (reward and punishment) mechanisms (Scott, 2001). In regulative and normative systems, powerful actors control mechanisms that support the reproduction of institutions: judicial systems may impose punishment; society enforces informal constraints such as signals of disapproval (North, 1998; Scott, 1994). In cognitive systems, the way situations and identities are defined (frame of mind) controls behaviors (Berger and Luckmann, 1967 [1966]; Scott, 1994).

3 Methodology

This study aims to understand how institutions, through institutional carriers, influence the process of reproduction of centralized decision making in a group of virtual communities. Drawing upon the interpretive tradition, this investigation explores the meaning people ascribe to their interactions (Berger and Luckmann, 1967 [1966]; Gadamer, 1989 [1975]). The data collection method is in-depth, semi-structured interviews with 58 community members in 2006 (Esterberg, 2002; Mason, 2002).

Interviewees were chosen through a snow-ball process: the first contact was with spokespeople, referred to in communities' websites; these participants recommended other members, and these others successively (Esterberg, 2002). The snow-ball process has limitations, as the sample may be biased (only referred people have been interviewed). However, the repetition of same information coming from a variety of members (confirming the enactment of centralized decision making, and the influence of specific institutional carriers) reduces the risk of having relied on untruth information. Even leaders, who would like to protect their position, have confirmed the centralized decision making and the conflicts among members and leaders related to this sort of social structure. This improves the reliability of the findings.

The transcriptions were coded through consecutive rounds, in order to guarantee the logical consistency of findings (Gadamer, 1989 [1975]; Mason, 2002; Rubin and Rubin, 2005). The initial coding was flexible, although grounded in Scott's framework (2001), following a theory-driven approach (Rubin and Rubin, 2005). Through successive comparisons between the code and the transcripts, a final code was defined, and again contrasted with the data in order to guarantee that each suggested carrier was widely present in the interviews. The validity of the study is supported by two facts: (i) constructs (category of carriers) were cross-checked among many interviewees, showing a level of saturation; and (ii) the final constructs formed a consistent corpus that is coherent with institutional theory (Gadamer, 1989 [1975]; Mason, 2002; Rubin and Rubin, 2005).

The findings bring second-level constructs, built by this researcher through interpreting the first-level constructs presented by interviewees (Schutz, 1962). In face of the limited size of this paper, very few quotations (first-level constructs) from interviewees have been added.

This investigation focuses on four Brazilian environmental-education virtual communities, as listed below (membership numbers refer to the general discussion lists in 2006):

- Rebea (Brazilian Environmental-Education Network): has been active at the national level since 1992 (380 members).
- Repea (São Paulo Environmental-Education Network): has been active in the State of São Paulo since 1992 (around 560 members).
- Remtea (Mato Grosso Environmental-Education Network): has been active in the State of Mato Grosso since 1996 (around 200 members).
- Reasul (Brazilian South-Region Environmental-Education Network): has been active since 2002 in three states of South Brazil (around 2,000 members).

These networks are considered communities as it is possible to define their boundaries in accordance with established common interests, common rules of interaction, and voluntary participation (Graham, 1999). These collectives are informal organizations, however membership is not anonymous. Their activity is concentrated on distributing news and organizing collective political demonstrations and petitions.

These communities were chosen for two reasons. First, they offer interesting settings for understanding how institutional carriers influence virtual environments as their main interaction channels are discussion lists. Second, some members centralize decision making in these collectives, although these communities have the ideal, at least in the rhetorical level, of constructing decentralized governance structures.

Aware of the contrast between the ideal (decentralized) and actual models (centralized) (informed by a pilot research), this investigation started each interview questioning why communities adopted the name networks. In this part, members have mainly explored their ideals of having decentralized decision making. Sequentially, interviewees were motivated to describe actual decision making. When elements of centralization appeared in their descriptions, the researcher asked the reasons behind adopting a practice which challenged the ideal model described beforehand. From the contrast between the model they would like to have (decentralized) and the model they actually have (centralized), members have recalled institutional carriers that influence their online behavior.

In these communities, some members (called here leaders) have access to segregated discussion lists in which ordinary members are not allowed. Leaders centralize decision making mainly through interacting on these leadership discussion lists. These lists are somehow a blurred governance structure: many ordinary members do not know that leaders make decisions through these channels, defining, for instance, who may represent the community at events, who moderates discussion lists and who publishes on their websites. These are examples of centralized decisions which affect the whole community.

4 Findings

Carriers	Pillars		
	<i>Regulative</i>	<i>Normative</i>	<i>Cultural-cognitive</i>
<i>Symbolic systems</i>	Legislation *	Expectations from society and community members	Hierarchical schemas
<i>Relational systems</i>	Power systems	Authority systems	Identities
<i>Routines</i>	Segregation by type of membership	Jobs and roles	Scripts defining community roles
<i>Artifacts</i>	Internet tools embed technical features	Internet tools follow standardized configurations	Internet tools are believed to be less efficient communication means

Table 1. *Institutional carriers: Brazilian virtual communities (* only observed in Rebea, Repea and Reasul).*

Table 2 summarizes the institutional carriers which are identified by community members as being related to the centralized decision-making structures the collectives have developed through time. The findings are presented in an aggregate format for the four communities, because the interpretations that emerged from each community are very similar. When the difference is relevant, it is pointed out.

4.1 Symbolic systems

In the *regulative level*, the Brazilian government has offered special funding to environmental-education virtual communities aiming to motivate them to appropriate Internet-mediated channels. Three of the studied communities (Rebea, Repea and Reasul) received money from the government through specific legislation (Fundo Nacional do Meio Ambiente), at the beginning of the 2000s.

As the studied collectives are informal organizations, they could not be held accountable by a contract. In order to solve this problem, the government allowed a formal organization (called *anchor*) to assume the representation of each community in funded projects. This anchor organization signed the contract, becoming accountable for the money and the project goals. Although the legislation did not interfere in community governance structures, anchor organizations adopted centralized decision making arguing that otherwise they could not comply with contracts. As explained by a member:

“The legislation established that the community should have a management group. Before this funded project, the community did not differentiate between members [leaders and others].”

In the *normative level*, expectations affect communities’ governance structures. First, society and donors expected communities to have formal representatives to negotiate agreements. Second, community members expected some participants to assume the community management of community. In practice, ordinary members lose power in decision making once the community accept that a few members are formal representatives. Members who have formal roles become community spokespeople and gatekeepers, acquiring status of legitimate authority.

In the *cultural-cognitive level*, community leaders drew upon hierarchical organizational models to organize collective action. These hierarchical schemas emerged from interviews as a taken-for-granted perception of how decisions are made in organizations, either because this is the way processes are organized in society or because respondents cannot imagine a way of making decisions in a more democratic structure. A member explains:

“Social relations in our society are hierarchical, with people who give orders and people who follow orders. It is difficult to try to change this structure.”

In this research, the term *hierarchical schema* implies only that members have different degrees of power in decision making, a meaning which emerged from the interviews. The term hierarchy has many other complex meanings that are not explored in this paper.

4.2 Relational systems

In the *regulative level*, power systems influence communities through interactions with actual and potential sponsors. Main community leaders were those who were directly associated with communities’ sponsors (universities, government and NGOs), being able to obtain and control resources for the communities. As related by a member:

“Civil society organizations face this drama: who sponsors also directs the community activities. The problem is not to receive money, but to have [or not] independence in using the funding.”

Sponsors also influenced the communities’ governance for interacting only with certain members. Government officials, for instance, held conversations only with a few leaders, affecting how the collectives perceived the legitimacy and authority of these leaders, vis-à-vis ordinary members.

In the *normative level*, reputation and status in society, such as being government officers, NGO leaders and academics, are translated into legitimacy in the studied collectivities. Authority in society is brought to the communities because members know each other (membership is not anonymous). In practice, members who had more authority in society more easily assumed leadership in the communities, as explained by a member:

“The status outside the community should be respected inside the community. The list should have people that are able to discern.”

In the *cultural-cognitive level*, community leaders cultivated the idea of sharing a common identity (history, values and ideas), differentiating themselves from ordinary members. For some leaders, this feeling of identity justified splitting the community into two groups: leaders, who were historically committed with community principles and were thus legitimate decision makers, and those who did not have the same level of commitment (ordinary members).

4.3 Routines

In the *regulative level*, leaders segregated ordinary members from decision making. In hierarchical organizations, this is a standard procedure that supports centralized decision making (Simon, 1997 [1945]). In practice, this procedure means that ordinary members are not accepted in leadership discussion lists, in which decision are made.

The segregation of people from decision making has similarities and differences in relation to the carrier hierarchical schemas. Hierarchical schemas legitimate the idea that some members (leaders) have more power in decision making than others (ordinary members), but they do not define who belongs to each category. The segregation by type of membership, however, stresses the roles in decision making: by definition those excluded from segregated discussion lists are not leaders and do not make decisions.

In the *normative level*, formal jobs and roles in society influenced the way members behaved in the community: members interacted in a way that was coherent with their social roles. Jobs and roles favored the centralization of decisions because members avoided disputing the centralization of decision making with their bosses or academic supervisors (or potential future bosses or academic supervisors). A member explains this relationship between online and offline environments:

“If you belong to an institution, you should say what is convenient to say. If I were a government representative, I would say that everything was marvelous [about policies on environment]. When you are member of an institution, you represent this institution.”

In the *cultural-cognitive level*, titles such as ‘executive secretary’ and ‘moderator’ influenced how members understood the role of those who had assumed these positions in the communities. Independently of being informed about the responsibilities of these roles, participants understood these scripts considering the commonsensical meaning of these words. In creating membership categories, scripts reinforce the legitimacy of some members to centralize decision making, as summarized by a member:

“When the community defines the role of an executive secretary, it implies power and responsibilities, the roles that people should develop.”

4.4 Artifacts

In the *regulative level*, websites and discussion lists have material features (technical specifications) which permitted certain members to appropriate their control. The websites were protected by passwords and only those who had the password could publish in these channels, thus centralizing the decision making related to which content is to be published. The discussion lists give special powers to their

creators, who may delete the list, include and exclude members, moderate messages and delegate power to others. The creator and delegates (moderators) had more power than other members, thus allowing the segregation of decision making. These features are embedded in the tools, during design, as explained by a member:

“The Yahoo! [discussion list] differentiates its creator from other members. This person may delegate power to moderators.”

In the regulative level (above), design allows some members to appropriate the tools and centralize decision making. Although the same tools may be configured in different forms, in these communities, websites and discussion lists were configured in a conventional way to keep leaders controlling these tools, favoring centralized decision making. In the *normative level*, the conventional configuration of Internet tools influenced communities in centralizing decision making.

Leaders controlled the publishing on the websites, through restricting password access. They also controlled discussion lists: they made a few members moderators, and kept the leadership discussion lists closed to ordinary members, through configuring the tool to demand approval of membership. These are conventional, widespread configurations, but leaders could have chosen otherwise.

In the *cultural-cognitive level*, different values and beliefs are associated to technology in these communities. Considering the interest of this research, it is notable that some interviewees emphasized the idea that Internet tools are less efficient than face-to-face interaction in communication processes. This symbolic value is not surprising: research confirms face-to-face communication is more efficient to solve complex tasks (Daft et al., 1987). However, this belief calls attention in the context of these communities, as discussion lists were their main communication channel, and communities do not have frequent face-to-face meetings (once a month in the best case, and in Rebea it may take years).

Cross-checking this belief with the context in which it emerges, a new meaning becomes clearer. Respondents (mainly leaders) argued that Internet tools were less efficient than face-to-face communication especially when denying using general discussion lists for decision making. Interviewees did not make the same association, however, when discussing leadership discussion lists as space for decision making. In practice, this symbolic value is recalled mainly when leaders feel the need of undermining the legitimacy of general discussion, without questioning leadership discussion lists. As a member summarizes:

“There is a polemic about the existence of the leadership discussion list. I do not know who is member of this list, and what they debate. I think the majority of [ordinary] members do not know about this segregated list. It is hidden.”

5 Discussion

This research investigates the influence of institutionalized governance structures in virtual communities. The findings suggest that institutional carriers influence social actors in the reproduction of centralized decision making in the studied communities. Although members stated the intention of building network governance structures, they admitted that centralized decision making was pervasive in practice, and recalled related institutional carriers when explaining their centralized practice vis-à-vis their ideal models. This section discusses these findings, arguing that institutional carriers are perceived by respondents as legitimating and sanctions mechanisms, which justify reproducing centralized structures.

Drawing upon findings and the proposed framework (Scott, 2001), table 3 summarizes how each of the observed carriers influenced the communities. The carriers function as legitimating and sanction mechanisms, complementing each other in the direction of fostering the differentiation between leaders and ordinary members, and in providing models and resources to support centralized decision making.

Carriers	Pillars		
	<i>Regulative</i>	<i>Normative</i>	<i>Cultural-cognitive</i>
<i>Symbolic systems</i>	<p><i>Legislation *</i></p> <p>The law empowered and legitimated members who were linked to the anchor organization in relation to others, favoring centralization of decision making in the projects which received governmental funding, model that was also reproduced in other community interactions.</p>	<p><i>Expectations from society and members</i></p> <p>Society and members expected the collectives to have representatives, who were empowered and legitimated as gatekeepers and spokespeople. Communities legitimated themselves in society by having these representatives.</p>	<p><i>Hierarchical schemas</i></p> <p>Members took for granted the appropriateness and efficiency of hierarchical schemas in which some (leaders) have more power in decision making than others, in spite of the incoherence between this model and their ideal of building network organizations.</p>
<i>Relational systems</i>	<p><i>Power systems</i></p> <p>Members related to sponsors had more power in decision making. Sponsors influenced how members perceived the legitimacy of leaders as decision makers.</p>	<p><i>Authority systems</i></p> <p>Members who had more reputation and status in society transferred their authority to the virtual interactions as legitimated leaders and decision-makers.</p>	<p><i>Identities</i></p> <p>Leaders cultivated a common identity, differentiating themselves (and their role) from ordinary members, in order to legitimate them as decision makers.</p>
<i>Routines</i>	<p><i>Segregation by type of membership</i></p> <p>Leaders enforced the segregation of ordinary members from decision making, not allowing their participation in the leadership discussion lists.</p>	<p><i>Jobs and roles</i></p> <p>Fear of sanctions made members avoid questioning their bosses and academic supervisors about the centralization of decision making (and other themes) in the virtual interactions.</p>	<p><i>Scripts defining community roles</i></p> <p>Members understood that those with titles in the community – such as executive secretary and moderator – were empowered and legitimated in relation to others.</p>
<i>Artifacts</i>	<p><i>Internet tools embed technical features</i></p> <p>Websites and discussion lists had technical, material features which permitted leaders to control these channels, favoring the centralization of decision making, thus enforcing the exclusion of ordinary members.</p>	<p><i>Internet tools follow standardized configurations</i></p> <p>Leaders configured websites and discussion lists in a conventional way, in order to keep the centralized control of these Internet channels, thus enforcing the exclusion of ordinary members from decision making.</p>	<p><i>Internet tools are believed to be less efficient communication means</i></p> <p>Members (mainly leaders) cultivate the rhetorical value that general discussion lists are not efficient channels for decision making, to legitimate the exclusion of ordinary members from decisions.</p>

Table 3. *The influence of institutional carriers (* only observed in Rebea, Repea and Reasul).*

Influenced by carriers, members attributed meaning and legitimacy to roles and forms of agency (actorhood) in their communities. Members accept models in which some have more power in decision making (*hierarchical schemas*). Those who have power believe it is legitimate to segregate others from decision making (*segregation by type of membership*). The *legislation* also differentiates among members, and society and members have *expectations* that some members should assume the representation and leadership in the communities. The entitlement of some members as executive secretaries and moderators (*scripts defining community roles*) also legitimize the role of leaders in relation to other participants.

These cited carriers legitimize the idea that some have more power, but they do not define who has more power. This is the function of other carriers. *Power systems* influence participants in the direction of legitimizing the leadership of specific members: those who are strongly related to communities' sponsors. Similarly, *authority systems* legitimize as leaders those who have greater reputations and status in the

field of environmental education. In addition, members reproduce social structures they are used to in offline environments for fear of questioning, in virtual interactions, those who have some level of power over them in their lives, such as their bosses and academic supervisors (*jobs and roles*). Finally, leaders cultivate a value that they have an *identity* that differentiates them from others, such as the belief that they are more committed to the community. Leaders use this sense of identity to justify their role as decision makers, which contradicts the objective of creating network organizations.

The symbolic value that *Internet tools are believed to be less efficient communication means* influences the legitimacy of the leadership group because of the contextual environment in which these communities emerge. The idea that face-to-face meetings are more efficient as communication channels does not legitimize the centralization of decision making. It becomes a legitimating mechanism, however, in the context in which this argument is used to justify that general discussion lists are not channels for decision making, meanwhile the segregated discussion lists are. In this context, the cited symbolic value is a rhetorical device used to justify the exclusion of ordinary members from decision making.

Institutional carriers are also sanction mechanisms, especially because interactions are not anonymous. The *legislation* provides reward and punishment mechanisms through offering funding and demanding accountability. The same happens with *power systems*: sponsors may both reward acceptable behavior by funding projects, or punish inadequate action by denying resources. In addition, the logic applies to *jobs and roles*: members may be punished or rewarded in their offline interactions for their online behavior.

In the studied context, Internet tools (websites and discussion lists) function as enforcement mechanisms by means of framing the opportunities of action: ordinary members may neither participate in leadership discussion lists, nor publish on websites. IT artifacts have *specifications* which offer a level of flexibility, allowing different configurations and appropriation. In these communities, the level of enforcement is stronger because leaders followed *conventions* in the configuration of these tools, fostering centralized decision making. These communities adopt Internet tools and forms of configuration which permit the reproduction of such model. Other tools and configurations could foster different models of interaction.

The findings reveal that different institutional carriers work together to support the same patterned behavior. When questioned about the reasons for adopting centralized decision making, respondents evoked explanations related to different carriers. Sometimes they recalled carriers to support the legitimacy of their behavior, considering taken-for-granted beliefs in society. At other times, they associated carriers with sanction (enforcement) mechanisms: specific behavior should be reproduced considering the social context. It is possible to observe the influence of individual carriers as well as the way they work together for supporting centralized decision making. By analytical reasons, it is convenient to understand the mechanisms behind each carrier, although in practice these mechanisms work closely to each other.

In the studied communities, in spite of aiming to build decentralized decision making, a process to be created, the communities reproduced a more centralized model. Although institutions may change through time, they also have a high level of inertia. The interdependence between social agents, the cognitive difficulty of creating alternatives to taken-for-granted schemas, and the fact that powerful social actors have interests in keeping current institutions may foster institutional inertia (DiMaggio and Powell 1991; March and Olsen 1989; Powell 1991; Stinchcombe 1968).

Community members recalled institutional carriers which reflect the interdependence between their virtual collectives and society. Institutional carriers permit to analyze in the micro-level the offline elements which support online governance structures, pointing out the relevance of the institutional environment when studying social structures observed in virtual communities and interactions.

6 Conclusion

Starting from an institutional perspective, this research explores how institutional carriers influence the reproduction of centralized decision making in a group of virtual communities. In following this strategy, this research contributes to reduce the gap in the research literature related to the understanding of how institutional environments influence patterns of interaction in virtual communities.

This study shows that Scott's (2001) framework is helpful to explore the process of institutionalization in the micro-level: avoiding abstract approaches on institutionalization, it is easier to observe how social actors interpret the influence of institutional carriers in their behavior (Czarniawska-Joerges 1992; Powell and Colyvas 2008). For instance, actors associated their behavior with specific social constructs, such as rules, roles, models and identities, and acknowledged the role of technology in influencing their virtual interactions. In addition, the paper demonstrates that the framework is applicable to virtual environments.

From a theoretical perspective, this research proposes that furthermore being repositories of social structures, institutional carriers may be also interpreted as sanction and legitimating mechanisms. In this study, institutional carriers influence the reproduction of institutionalized social structures because they legitimate and enforce patterned behaviors. In addition, the research points out that a patterned behavior is supported simultaneously by many institutional carriers, revealing the complexity of choices (agency) behind the enactment of social structures.

The research reveals that although the framework focuses on the structural side of reproducing patterned behaviors, the perspective on institutional carriers indirectly also uncovers the relevance of agency. Thus although this article focuses on institutional carriers, agency is pervasive as emerged in the arguments to justify the reproduction of centralized decision making in collectives which aim to enact decentralized governance structures. For instance, social actors decided which Internet tools and forms of configuration they have adopted. Then these tools and configurations have become carriers of centralized decision making in these virtual environments for the action of these actors in the level of choosing technology, defining its configuration and constructing social values related to the tools.

For practitioners, this study shows that the kind of interaction which emerges in virtual environments may be closely related to patterned interactions observed in offline interactions. The paper clarifies that the centralization of decision making in the studied communities is greatly influenced by the hierarchical organizational model. Thus attempts to create new virtual environments – such as virtual teams, collaborative interactions and all sorts of communities – should take into account the context in which such online collectives emerge. The intention of creating new forms of interaction in virtual environments may not be successful if not supported by broader institutional structures.

Lastly, this investigation opens questions that deserve further research. This study suggests that carriers contribute to build the legitimacy of a patterned behavior, but it is not clear which carriers have been more important in this process. Further research may try to ponder the strength of some carriers in relation to others. Further research may also investigate carriers in different settings, in order to explore whether there are patterns through settings relating specific carriers to sanction and/or legitimating mechanisms.

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