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Resolving the dilemma between team autonomy and control in a post-bureaucratic era: Evidences from a telco multinational company

Maria Carmela Annosi, Federica Brunetta

INTRODUCTION: CONTROLS IN A POST-BUREAUCRATIC ERA

Innovative firms in global markets have grown aware of the importance to keep the ideas alive and to renew their learning and innovation capabilities, while focusing on reaching high quality and low cost and responding to customers' needs. To achieve these objectives a growing number of firms have embraced the conversion to the so-called "post-bureaucratic" organizational structures, transforming from hierarchically-based to flat organizations built around self-managed teams. So, they moved from a coercive form of organization — abrogating individual autonomy and focusing on the typical technical efficiency of bureaucracy — to a context where individuals are provided with broader information and pushed to interact creatively, master their tasks, and assess their performance against their historical standards (conceived as valuable resources for both performance optimization and identification of opportunities locally and systemically). Indeed, bureaucratic organizational forms, based on fixed boundaries and hierarchical, top-down, control and authority were not fit to face the volatility of market and the high level of environmental dynamism and uncertainty. Therefore, a "horizontal shift" has occurred, reducing the level of vertical differentiation of hierarchical forms. In order to improve the organization readiness to change, cross-functional processes were implemented, delayering, giving empowerment and delegating the decision power closer to knowledge and information.

Self-managing teams, working cross-functionally, represent the basis of post-bureaucratic organizational structures, promoting authority decentralization and employee empowerment. Network relations and crosscutting links between members supposedly create favorable conditions for organizational learning, fostering innovation and flexibility. We define innovation as the adoption of any process, product or service previously foreign to the focal organization. Indeed, past research has stressed the relevance of individual, organizational, and environmental factors as correlates of innovation, while others have viewed innovation as a function of all three factors.

Nonetheless, experience proves that it is more difficult than expected to uncover ideas or to make use of internal capabilities for learning and innovation purposes. Despite the wide adoption of the team-based organizational structure, there are still challenges to address to be able to lead teams towards the achievement of a good balance between learning, innovation and performance goals. For example, understanding the proper role for team executives and leaders, and the effect of organizational controls in shaping team behaviors and values. These challenges still do not find appropriate responses due the difficulty to match proper managerial interventions with specific internal team characteristics and configuration. Internal and external contextual factors can have multiple and unexpected conflicting influences on team learning capability and performance. This is the case of the focal multinational corporation in the telco industry that we analyzed.

This article focuses on organizational controls acting at the individual, team and organizational level, unexpectedly causing the decline of learning and innovation performance. We describe their combination and their effects on the achievement of organizational learning and innovation goals (Fig. 1).

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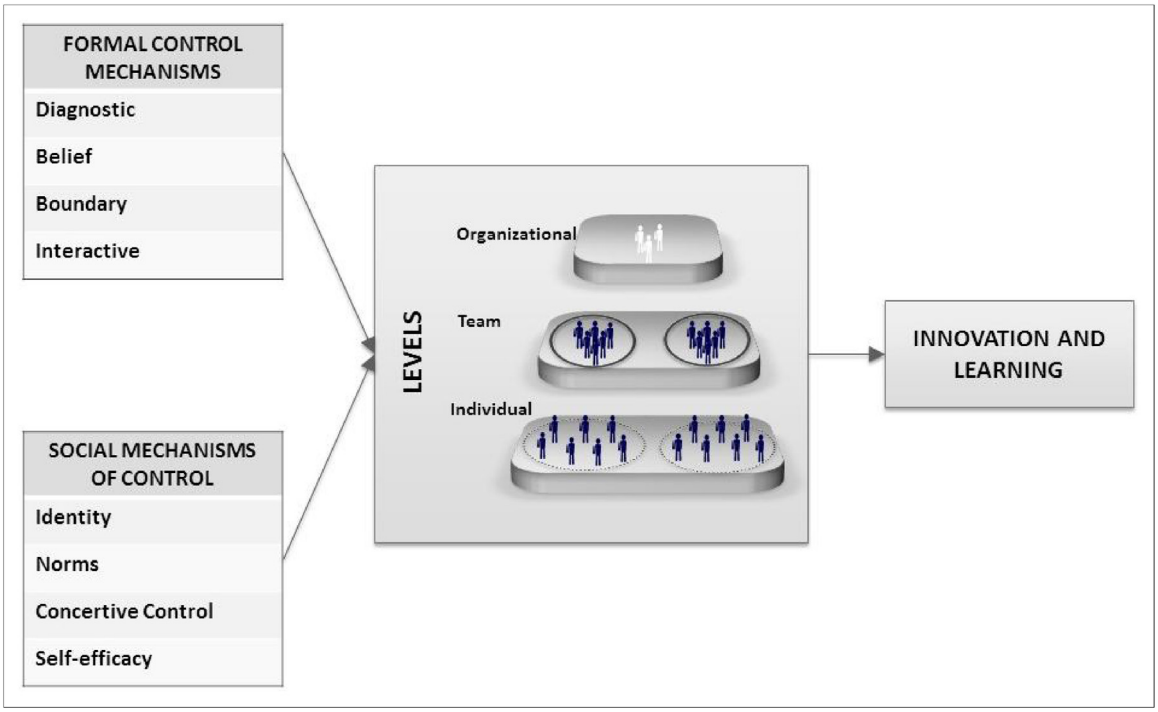

Figure 1 Study Outline

Through the empirical observation, we focus on the combination of formal controls and on those mechanisms — beyond the formal ones — arising from social interaction; e.g., vicarious processes inside the team (learning through interaction, or simple observation, of a referent), hidden cognitive processes (such as individual team identification) and individual attributes such as self-control.

This study extends social learning theory as it clarifies the nature of the organizational control mechanisms affecting generative learning behaviors of individuals inside self-managing teams, which are responsible for innovation results. A set of interrelated controls (identity, norms, self-efficacy, concertive control, organizational goals and feedback loops) enacted at the level of the individual, team and organization, define a typology of organizational learning mechanisms that applies in a context of self-managed, team-based organization. Such a typology is the basis for developing accurate descriptions of learning situations in self-managed, team-based organizations, and thus serves as an analytical tool for managers who are interested in investigating how to improve learning and innovation performances.

By identifying the relevant control mechanisms, influencing learning and innovation capabilities, this article also provides indications for reconciling different kind of organizational goals — such as learning and organizational performance — within new organizational forms that rely on self-managing teams.

ANALYZING CONTROLS

To analyze the relevant organizational control mechanisms in self-managing, team-based organizational context, we conducted a study within a large multinational corporation in the telecommunication industry. More specifically, we analyzed eight of its Research & Development companies in different geographical areas (see Exhibit 1).

We spent five years researching the way these R&D companies tried to accelerate their R&D effort through low-cost production strategies and radical adoption of new practices based on self-managing teams. We observed how these companies developed process innovations, to increase speed and reduce costs of software implementation by: (i) applying lessons from production lines; (ii) pushing the adoption of short release cycles to rapidly incorporating customer feedback; (iii) approaching to parallel development of software modules to cut the lead times; (iv) reshaping their organization design, leveraging on cross-functional teams to have smooth learning curves and flatten their organizational structures while speeding up problem solving.

These organizations challenged their conventions, to attain higher workforce flexibility and preserve the integrity and quality of their products. While shifting towards these new practices, they pushed the boundaries of people competencies, allocating individuals within stable teams of competent workers — engineers and technicians — with diverse backgrounds and experiences. By dividing the work over the various parts of their software systems they assembled the derived products and managed to accelerate the delivery process. On each stage of new product development, the new practices also involved delegating to the group many tasks, potentially affecting various parts of the software system.

Internal product experts were often asked to support teams, thus providing their expertise on-demand. R&D processes were also divided into early stage and implementation. Early stage projects were staffed with highly specialized

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Exhibit 1. About the Research

Researching the long-term implication of any management practices is difficult, particularly in a large organization, and perhaps especially in an area as tough to measure as creativity. To give ourselves the best possible chance, we adopted a multi-method approach to focus on the outcomes of Agile practices within a multinational corporation in the telecommunication industry. Between 2012—2017, we conducted three surveys and dozens of interviews within eight R&D branches of the firm, spread over more than 12 different countries, as well as several discussion and feedback sessions with employees in various levels of each involved organization. Given the lack of systematic literature studies on the usage of organizational controls within new organizational forms, qualitative data collection and analysis were based on grounded theory methodology, which is particularly suited for doing research in overlooked areas of management and for uncovering established and universal explanations of social behavior.

Participants included thousands of programmers and software developers, hundreds of middle managers, and several senior managers across different units.

employees, with a prominent level of seniority and experience, while "normal" R&D workers carried on implementation. Using a common physical space for managers and team members reduced status distinction.

Investments were made to automatize software release integration (with high capital costs) and in training the new teams on principles and practices of the adopted methods. The result was a highly industrialized approach that reduced by 60% the end-to-end lead-time, and by 40% the maintenance cost, thus allowing room for implementing new product innovation investments. The big transformation that organizations embraced addressed different critical elements: (i) customer interface, improved by securing more releases and higher responsiveness to their requests; (ii) employee motivation and growth, improved by providing team members opportunities to improve their competencies, by operating in cross-product and cross-functional teams while keeping the autonomy to work with few organizational constraints, and to align, direct and control the strategic choices of the organization; (iii) IT infrastructure enhancement, through the development of customer service and maintenance protocols.

The eight R&D companies all focused on rethinking and reengineering their managerial practices to achieve short and long-term goals as learning and product innovation. Thus, when they launched this new way of working, they started examining its effects on different managerial practices, including the analysis of new management control systems, standing at the basis of new product development and innovation activities. They were then involved in a huge assessment after their transformation project was completed.

FORMAL CONTROL MECHANISMS AND THEIR ENACTMENT

In the organizational environment, we identified four types of formal control mechanisms used to execute a predefined organizational strategy: diagnostic, belief, boundary, and interactive control systems (Table 1). Specifically, we were able to identify and analyze the functioning of each of these mechanisms originating from multiple organizational levels — individual, team and organizational — and affecting the learning and innovation performance of individuals inside their respective teams (Table 2).

Diagnostic Controls

Within the observed firms, diagnostic controls worked like the Seismometers (which allow sensing and recording the motion of the Earth) and constituted the basis for managers and team coordinators to monitor malfunctioning and to scan that relevant performance indicators stood within pre-defined and acceptable limits. Specifically, managers aimed to track goals, to monitor work progress, and to measure and adjust deviations from a pre-defined level of performance.

Diagnostic controls acted at individual, team, and organizational levels. At the team level, we observed team routines and the regular requests from the teams' leaders and proximal stakeholders (middle managers and customer representatives) to be updated on work progress. For example, daily meetings among teammates to track work progress and identify needed actions, regular meetings with proximal team stakeholders to show the results of short iteration, etc. At the organizational level, enacted by top and middle managers, we observed how controls shaped and monitored team behaviors, e.g.: team performance and learning goals,

Table 1 Formal Control Mechanisms Definitions (Simons, 1994)

Formal control mechanisms	
Diagnostic	Formal feedback systems used to monitor organizational outcomes and correct deviations from preset standards of performance
Belief	Formal systems used by top managers to define, communicate, and reinforce the basic values, purpose, and direction for the organization
Boundary	Formal systems used by top managers to establish explicit limits and rules which must be respected
Interactive	Formal systems used by top managers to regularly and personally involve themselves in the decision activities of subordinates

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Table 2 Examples of Formal Control Mechanisms on the Analyzed R&D Companies

	Individual	Team	Organization
Diagnostic	Team members set self-determined goals to meet the project deadlines and to continuously improve performance	Teams leaders and proximal stakeholders implemented performance management actions by setting team goals	Organizational and managerial layer tracked and monitored team performance and progress by setting goals and requiring constant feedback loops
Belief	Team members aligned with team identity, defining their priorities and performance	Middle Managers transmitted the importance of knowledge sharing and competence broadening	Top managers focused on communicating the value of efficiency as an enabler of value creation
Boundary	Routines provided individuals with priorities and information on tasks	Team members adhered to routines identifying and reinforcing acceptable behaviors. These limited team's freedom for initiatives outside specific instructions	Recurrent routines involving team members and stakeholders provided a link between team members' action and priorities and the organization
Interactive	Individuals had regular meetings and interactions with managers and stakeholders working together on the same priorities	Regular informal talks were used by managers and team stakeholders to monitor and recover relevant information from the teams	Regular reflection meetings upon crucial organizational issues created an influence cascade

information radiators to monitor work progress and competence against the established goals.

> *We receive feedback from our manager and product owner concerning if we have done a good job, if we have some areas to improve, and in most cases we get positive feedback. We are evaluated in terms of sharpening our processes to be better in some areas we are not good at, improving our way of working. We have values stream mapping exercise so if we have underestimated any activities, the manager organizes meetings in which we talk about why it took so long. [Team member]*

At the individual level, we detected the development of self-determined goals and the spontaneous establishment of feedback loops that autonomous individuals set to meet the deadlines established at the team and organizational level — whilst improving performance and meeting stakeholder's expectations.

> *We have a team self-assessment, which is facilitated by the managers. The dimensions checked during this event are: Cross-functional competence and the number of blocks known. [Line middle manager]*

The establishment of clear performance goals, and the individual reactions at the self-evaluation level, triggered by the feedback loops and by the attribution of relevance to the tasks, explained team members' inertia towards learning and innovation.

> *Teams don't spend time on digging the product, people are just making features. [Line middle manager]*

Belief Controls

Belief control systems were adopted by the focal organizations to communicate key business values, direction and goals that managers wanted to be achieved by team members. The main aim of these controls was to raise and stimulate commitment to the organization's core values. They provided employees with a clear and coherent picture of the key organizational values and of their role within the business.

As the diagnostic controls, they acted on three distinct levels. At the organizational level, top managers used them to reinforce the positive image of the transition to post-bureaucracy by underling the importance to gain higher levels of efficiency to increase value creation.

> *My view about the main problem is that we need to be more efficient to produce more, and then to be able to innovate. Becoming more efficient is a condition to have innovation in place, [. . .] it is hard to get things into the product because the demand is there but the capability was low. [Top manager]*

At the same time, middle managers tried to create the conditions for a successful implementation of post-bureaucracy, emphasizing the importance of knowledge sharing among team members and of competence broadening, which is crucial for teams to work as cross-functional.

> *[. . .] so knowledge sharing is a big challenge as well. People should have the personality and mindset to share. They need to understand that through sharing they can help the team itself to be better. [Line middle manager]*

At the individual level, the team absorbed managerial beliefs:

> *They're now sharing tasks, peering up, challenging each other to do different tasks but that took over a year to get teams to do that because they were very focused on getting the feature finished. But now they see the advantages of sharing the load and try to help each other learning, but it took them a while to see that personal learning and having a breath rather than only depth in certain areas was important. [Line middle manager]*

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However, when the understanding of the tasks was limited, individuals showed limited willingness to go beyond superficial learning.

Our team learning opportunity is not much, we have been working with 2 features at the same time, we had pressure for delivering those features and we don't have much time to dedicate to learning. It is not the same priority as developing and delivering features so we don't spend much time on learning. [Team member]

Boundary Controls

Boundary control mechanisms worked as the organizational reins. Just as reins give a horse cues, signals and commands to control its movements and actions, boundaries put limitations and orders that need to be respected within the organization. The boundaries, in the focal organizations, were typically expressed in standards of behavior and codes of conduct.

Specifically, they were revealed through the complex set of routines to which team members had to adhere, identifying acceptable behaviors. For example, the presence of the "product backlog" — a list of specific tasks to perform — seemed to limit the team's freedom to reserve time for anything that was not clearly indicated during a specific work iteration. These routines were recurrent, in cycles of three weeks. Team members were supposed to develop new products starting from a set of defined customer requirements. These working routines aimed to provide individuals the information on task priorities. They also facilitated team members' participation in social interactions. Additionally, some were also designed to foster communication towards the relevant team stakeholders, such as middle managers and customer representatives. Acting on the border between the team and the organization, these routines provided a link between team members' actions and priorities and the organization. Thus, recurrent routines involving team members and stakeholders, created, channeled and spread the attention of team stakeholders into the specific team processes.

In agile we are in quite regular mode, working in a regular and constant time box, which is called sprint, three weeks long. At the beginning of each sprint we have a half day meeting called sprint planning, where the agile team members are looking at the sprint backlog. As a team, we know our capacity and according to our estimation of it, we take items in the product backlog, pulling out user stories. Among the user stories we have also some bonus. It deals with normal work as a normal user story, but it also represents something for which the team does not take a specific commitment to implement by the end of the sprint [. . .]It aims to fully use the team's capacity if some spare time occurs. [Team coordinator]

Through the product backlog and the regular enactment of team routines, team members perceived the difficulty to trigger other activities than producing new software functionalities for accomplishing new project development goals.

Teams don't have much space or room to do bigger improvements. It would be a bit suffocating because we don't have room, we have a backlog where there is 10% dedicated for improvement, so improvements tend to become quite close to what teams are doing and smaller, we encourage them to present ideas in pre-scope meetings, but in general teams are focused in finding small improvements since bigger ones require much more involvement. So indirectly we are encouraging small improvements, since big improvements are very difficult to become part of the current setup. [Team member]

Interactive Controls

Interactive control systems could be explained through the metaphor of the "*Holter test*". The Holter monitor is a device recording heart beats continuously, usually worn for 24—48 h, while performing normal tasks and activities. It is returned to doctors who verify why an abnormal rhythm has occurred by analyzing the data and collecting explanations on the patient activities and symptoms during the test. Afterwards, together with the patient, the doctor reviews the therapy/treatment to react to emerging problems. Similar to the relationship between the doctor and the patient, the interactive control systems consisted of formal mechanisms, adopted by managers, to systematically and personally impact on employee decision-making.

Within the assessed organizations, the interactive control systems were used at the individual, team and organizational levels, each interacting and reinforcing each other. Looking at the interface between individuals and the organization, we found that middle managers and stakeholders regularly spent a few hours each week talking with individuals within their teams, trying to transmit to them the sense of urgency to complete their actions, and offering them support for team operations.

I try to interact with teams; sometimes it's not easy. Then also, it's continuous communication with the team, and then there are grooming sections if you feel you have underestimated/overestimated the effort needed for the user stories (or if new ones are added), you can re-estimate new values for the user stories. [Line middle manager]

Through regular informal talks, these actors were also trying to recover relevant information from the teams, and to monitor indirectly their progress. At the level of the team, middle managers and team coordinators had regular meetings to get relevant updates about the progresses and the team climate. Through regular interactions, they also had the opportunity to keep their attention on organizational issues. At the organizational level, middle managers and the head of the organization responsible for the development of new functional requirements had regular interactions by working together at the same table, and attending regular reflection meetings on crucial organizational issues. By doing so, they could create an influence cascade.

We sometimes meet with a team coordinator to discuss issues that we need to coordinate. We have other formal meetings every third week of the month in order to discuss about impediments with team coordinator. [Line middle manager]

More specifically, top management by designing interactions through newer forms of governance, could create circle

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of constant communications, where higher-ranking members could exercise greater influence over the behavior of the group and its members.

ADDITIONAL CONTROLS: THE RELEVANCE OF SOCIAL MECHANISMS

Conscious efforts to design or engineer top-down control mechanisms in the organization may not produce any effect on self-managing teams. Indeed, ordinary individual interactions have a potential amplification impact that can allow gathering adequate collective agreement to induce change in dominant rules. Connectedness and belonging led to the formation of ties and alliances among team members and between individuals and larger groups, producing few differences in individual behaviors. In-group membership served as a basis for social comparison and represented the framework for both self-evaluation and for the selection of others. We observed the increasing relevance of social controls, norms and concertive controls, acting in conjunction with the formation of a solid team identity. The content of these controls was connected to the nature of team identity; thus, they sometimes competed with the level of reactiveness of individuals, which was driven by a high perception of self-efficacy (Table 3).

Identity

A common social identity within teams revealed where members collectively intended to go and the core values they believed in, allowing to generate socially validated knowledge, shared beliefs about ways of working, and priorities. As the social consensus determines which reality for team members makes sense, individuals relied on socially approved knowledge, practices and theories, as well as group categories, inducing the formation of characteristically "collective" behavior.

The meanings adopted inside the groups, the way team members categorize them and view people and things, is affected by the judgment of others. The same kind of people in diverse social environments may accept or reject the same piece of information. In most of our focal cases, for instance, the identity of self-managing teams, because of the elevated level of interaction with project stakeholders, was built on the need to satisfy project tasks and accommodate them. Consequently, teams were often unable to conform to the expectations of innovation managers because doing so would require defying project stakeholders. As such, teams could resist innovation managers by claiming a lack of time for innovation, and by arguing that the quality of the product was the priority.

> *Working in autonomous teams, but they do not give us any freedom. There is no room left for creativity. We have to be fast. When ideas pop up, we do not reserve time to analyze them. We do not have time to implement ideas. [Team member]*

Thus, the effect of the new organizational design, based on regular interactions with key stakeholders and organizational routines, constant reporting and visualization of the progress of the team, influenced the formation of the core team concepts determining its actions and choices.

Norms

Instructed by the nature of team identity, team norms represented the approved judgment within the team's boundaries. Norms constrained the amount of possible change mechanisms available to team members. For example, the pressure to get the job done seemed to characterize the norms of conduct of team members, representing an under-explored barrier to change into their organizational context. Pressures emerging from the team context undermined individual behaviors of learning and innovation.

> *This way of working makes us more competitive. The team is more responsible for the features; we need to finish the feature as soon as possible. Learning is painful in this setup, it is not only the mindset, and you have to be willing to learn. [Team member]*

Concertive Control

Maintenance of team norms happened through a form of horizontal control exercised by peers and endogenously pressuring the team. This type of control is defined as concertive control. Concertive controls reveal how team members, "in concert", develop mechanisms for controlling their own activities. They shift from values towards norms and rules that bind and limit, being invisible. Concertive control is fostered by the influence that team members dynamically exercise on each other to ensure compliance to the "norms and rules".

With the establishment of norms and rules, a model of approved behavior was developed inside the observed teams as their members' actions were guided by past experiences and legitimated notions. These norms and rules provided the workers with a sense of self-control aiming to achieve a high

Table 3 Social Mechanisms of Control

Social mechanisms of control	
Identity	Cognitive image held by individuals within the organization that is used to make sense of the world
Norms	The descriptive (what others do) and the injunctive (what others approve or not) elements of team identity shared by members
Concertive control	How team members, "in concert", develop mechanisms for controlling their own activities
Self-efficacy	Instigation and persistence of behaviour. The more people believe in their own effectiveness, the more likely the impact on their choice to attempt to cope with given situations

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output quality for the team. Within the assessed self-managed teams, people felt watched if they contributed to team goals, and felt uncomfortable if they were below from what other team members were doing for the project. Hence, they felt implicitly forced to finish their task as soon as possible to start the next one.

Now we are working with new products and we have to learn how they work — at least so much that we can see where and how to do the implementations. But to really understand the product (to be able to do improvements) that takes time and how to propose that for an OPO (before you have knowledge about the product you even don't know if you can propose/do any improvements — spending time of investigation without any outcome isn't so popular I guess). [Team member]

Team norms were maintained through the increasing regularity of interactions among members. Leveraging on this normative form of control the collective consensus on a shared set of values, focused on the accomplishment of project goals, constrained their behavior. The presence of concertive control inhibited them to embrace learning and innovation actions.

Further Levers of Action for Team Members: Self-efficacy

An individual's self-efficacy, in social cognitive theory, is the belief that one can execute successfully a specific behavior required to obtain a certain outcome. It represents the engine driving individual proactive actions inside teams.

The more people believe in their effectiveness, the more likely the impact on their choice to attempt to cope with given situations. Given the skills and incentives of team members, self-efficacy was a relevant antecedent of personal choices in terms of behavior, effort investment, and activities. With a reduced level of knowledge depth due to the organizational decision to have them allocated to a wider array of system parts to gain in flexibility, teams were characterized by a low level of self-efficacy, not embracing other goals, especially goals related to the creation of new product knowledge.

Earlier we worked in a certain area, but now our features strike on every subsystem, and we don't have enough knowledge about it so it's difficult. [Team member]

HOW DO SELF-MANAGING, TEAM-BASED ORGANIZATIONS EVOLVE THROUGH CONTROLS?

The analyzed self-managing team-based organizations can be seen as a set of teams, who autonomously engaged in activities, which were coordinated at a higher level in the organization. Their objective was transforming, either directly or indirectly, inputs into outputs. Therefore, their belonging units could be conceived as a system of focused and self-regulated team actions integrated in a larger process of delivering outputs. Thus, we argue that the organization's effectiveness depended on the long-term learning strategic choices of teams, leading them to improve these transformation processes. In this context, organizational effectiveness was affected by the level of the prior knowledge available to each team (influencing the level of perceived efficacy) and the organizational capability to induce a formation of collective agreements about prioritized strategic objectives. Following the dynamics of individual behaviors in combination with organizational controls, a better view of the established path-dependent mechanisms can be obtained (Fig. 2).

Teams exhibited an adaptive behavior over time. This adaptation occurred at the individual level, through the comparison of one's own behavior with behavioral models

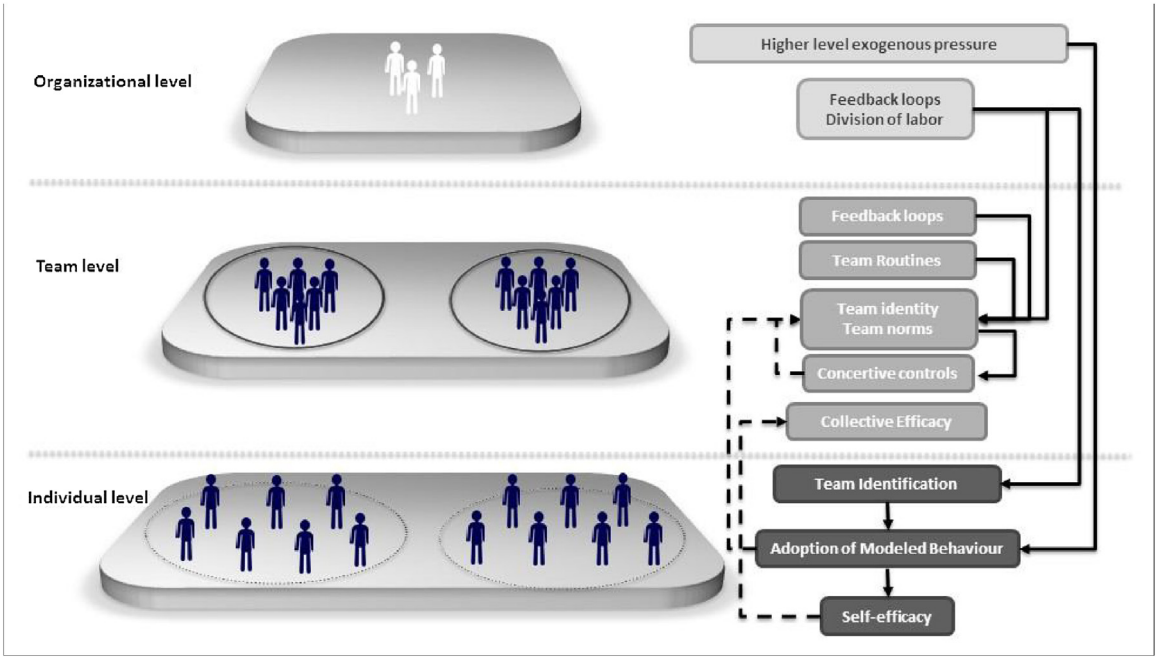

Figure 2 Dynamics of Organizational Control

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approved by team identity. The established team identity, then, defined the attention processes during the action sequences of team members, allowing the team to change its incentives and to guide its responses.

Inside the team, individuals modified their goals based on their actual – or vicarious – experience. Team objectives were dynamically adapted to include the mastery of other team members in similar situations. Through this process and with the help of team norms, teams learned how to focus on some relevant aspects of the environment and neglect others, in our cases overlooking learning and innovation to favor the collection of individual efforts to accomplish project goals. Adaptation was also triggered by previous learning experience both influencing individual perception of their efficacy and shaping their formation of expectations.

In this light, organizational controls can be considered as linked to team identity and norms, internal legitimization and justification pressures, as well as environmental forces, standing at the basis of the routines used by team members to sense problems, prioritize and develop solutions.

Several factors influenced the learning behaviors of self-managing, team-based organizations. The examples we discussed show how the organizational controls, determining the search, transfer, interpretation, and use of knowledge by team members, were enacted within a self-managing, team-based organizations. We view them as formal and informal learning systems constituting how learning is perpetuated in the organization. Examples of these learning systems include team identity, team norms, self-efficacy, and goals.

DISCUSSION

Organizational learning is, by its nature, multilevel. Knowledge generated by the individuals is not amplified to the organization independently. Ideas diffuse and groups elaborate common meanings until they are institutionalized. Analyzing learning in a team context requires a multilevel perspective to consider the impacts of individual attributes, contextual factors and team variables on procedures that involve individual and team levels. However, only a few research studies have considered the multilevel nature of organizational learning in an explicit way. This study provides a multilevel perspective on the managerial precursors of learning after transitioning to post-bureaucracy by focusing on the interplay between managerial control systems and team level dynamics. By evaluating how external control at one level influences the process of internal regulation and control in another, this paper sheds light on the tensions that exist in 'post-bureaucratic' organizations between the external forces, enacted through traditional managerial control systems, and the internal ones exerted horizontally by peers within self-managing teams.

A variety of formal and informal controls was implemented within organizations relying on teams and applying principles of decentralization of power and decision-making processes. However, there has been little research effort examining combinations of controls or describing the array of practices impacting on learning and innovation. Despite social interaction between individuals is conceived as beneficial for learning and creativity, there is still controversy over the optimal structure of that social interaction within and across teams.

Our results can be easily transferrable to other companies applying the concept of decisional autonomy to teams and individuals. In this light, a potential avenue for further research would be to track, over an extended period of time, the evolution of different types of R&D organizations in companies in diverse industry contexts, in order to confirm the effects of the underlying forces of organization development identified within this study.

KEY TAKEAWAYS

We proposed a typology of organizational control mechanisms and their relevant relationships with learning and innovation behavior that can be applied in a context of self-managed, team-based organizations. The proposed typology of organizational controls recognizes that the individual, team and organizational levels need to be considered to clarify the mechanisms of alignment between individual, team and organizational goals. We built on and extended the social learning theory by considering the role of teams as proper interfaces between individuals and the organization, and by going beyond the formal mechanisms including the additional controls arising from social mechanisms. This study also analyzed the emergence of patterns of individual and collective learning behavior giving attention to how individuals perform a learning behavior within a situated context.

Specifically, this article offered a wide description of the main dynamics of learning and innovation within self-managing teams which rely on the following core levers of controls: (i) diagnostic and interactive control systems, maintaining the attention constantly focused on relevant project goals; (ii) boundary control systems, limiting areas of action; (iii) belief control systems, aiming to prepare individuals to transformation, providing the rationale for accepting relevant changes; (iv) identity and norms, as "social facts" giving ideas about the main interpretative frames associated with individual expectations; (v) social approval, and the social influence over individual actions contributing to maintaining a regime of social order and stability.

CONCLUSION

This article provides empirical insights into how managerial controls apply in a context of self-managed, team-based organizations and affect the emergent individual and collective choices to learn. Additionally, it investigates how the content of these controls may come into alignment with the current organizational objectives.

It offers useful suggestions to managers of self-managing teams. Combining the examination of different managerial control mechanisms allows analyzing the learning capability of self-managing, team-based organizations which needed to be explored as socially constructed, yet maintained, in a politicized social environment by interacting actors of varied power, operating within and outside the field.

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Maria Carmela Annosi is Assistant Professor at the Management Studies Group of the School of Social Sciences at Wageningen University, The Netherlands. She received her PhD at KTH Royal Institute of Technology, Sweden, and has been a Visiting Scholar at Rotterdam School of Management, Erasmus University, The Netherlands. Her research interests include knowledge and innovation management (Wageningen University & Research, Department of Management Studies, The Netherlands. E-mail: maria.annosi@wur.nl).

Federica Brunetta is Assistant Professor at the Department of Business and Management, LUISS Guido Carli University, Italy. She received a PhD from the Catholic University of Sacred Heart, Italy, and has been a Visiting Scholar at the University of Michigan's Ross School of Business, USA. Her research interests include strategy and management of innovation (LUISS Guido Carli University, Department of Business and Management, Viale Romania, 32, Rome, Italy. E-mail: fbrunetta@luiss.it).

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