Innovation as Argumentation in Closed and Technology-mediated Open Models

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Abstract: The paper uses activity theory and Activity Based Analysis (ABA) for understanding the contradictions developing, and the corresponding remedial actions required, in the transition of an organization from the closed to the technology-mediated open mode of innovation production. We use activity theory to develop nested representations of the innovation process in both business models, and concentrate on the argumentation-in-innovation activity and its context. We demonstrate the application of ABA in the analysis of contradictions developing in the argumentation processes of a firm in the food and beverages sector adopting open innovation strategies implemented in the innovation community mode.

1 INTRODUCTION

In a process view, innovation is the result of a series of coarse-grain interlinked activities (idea generation, selection and conceptualization of product/service/process, technical development, launch, value appropriation, etc. (Tidd and Bessant, 2014)), in which "knowledgeable and creative people and organizational units frame problems and select, integrate, and augment information to create understanding and answers" (Teece, 2001). These activities constitute problem resolution tasks at-large (Leonard and Sensiper, 2003) that combine emerged and more concretely-defined fine-grain problems. Propositions for resolving these problems and evaluation of propositions are placed by diverse stakeholders (managers, employees, technology suppliers, customers) that act as knowledge sources along the innovation process.

The innovation process is triggered by novel ideas and propositions for novel technologies, products, etc, or even strategic initiatives towards innovative business models. These, contradicting and in conflict with other explicit or indirect proposals, are arguments with supporting evidence, which have to be evaluated and accepted, or at least accommodated, in a collective manner within the specific organisational context (Wright, 2012). Argumentation is thus a context-based knowledge-creating activity and can be mediated by the technological means employed for exercising it. Specific forms of argument exercised frequently, or by powerful actors, become *dominant schemes*, characteristics of the organisational discourse (Potter and Wetherell, 1987), in general, and of innovation processes in particular.

The aim of this paper is to investigate how such dominant argumentation schemes influence the general context of the innovation production process, and, in turn, how a dominant argumentation scheme is influenced by the context of the innovation process. Adopting a practice perspective and using activity theory, the specific objective of this paper is to investigate how the context of a computer-mediated open innovation process influences the dominant argumentation scheme of a company, and vice versa. Argumentation is a very important issue in the context of Open Innovation (OI), as it enables *active transparency* (Adamides and Karacapilidis, 2019) – a capability that is constituted by the capabilities of generative sensing (Dong et al., 2016) and productive argumentation – and which should be in line with the changing context of the innovation process.

Following, first we consider argumentation in the innovation process. In section 3, we briefly discuss the characteristics and role of argumentation in organisations. We continue in section 4 with the introduction of an activity-theoretic model of

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argumentation practices in innovation and a related process for investigating the impact of interventions in organisations. Then, in Section 5, this model is employed for analysing the contradictions developing between the argumentation scheme and its context and the interventions for their potential resolution in a coffee roaster and coffee shop franchisor company that intends to switch to technology-mediated open innovation strategy in the innovation community mode. We conclude with a brief discussion of the research presented in the paper.

2 THE MEDIATING ROLE OF ARGUMENTATION IN THE OPEN INNOVATION PROCESS

In today's interconnected and dynamic world, open innovation has received much attention in both academic and business spheres, signifying a novel business model that has already been considered at different levels of analysis (Bogers, et al., 2017). The adoption of open innovation (OI) (Chesbrough, 2006) by an organisation implies that its innovation process becomes porous, and ideas, concepts, design, products, services etc. flow in and out of its boundaries. Different human and non-human knowledge sources associated with internal and external organization actors become interconnected in many different ways, and information and knowledge items of different forms flow between them, and are transformed in many different ways, for the development of the required capabilities (). Clearly, in large complex organizational settings, this is accomplished in a complex web of social processes (Anderson and Hardwick, 2017), in which, and in accordance with the OI model adopted (innovation *markets, communities, contests, or toolkits* (Möslein, 2013), agents of different views, interests, cultures and power status, usually being situated geographically and contextually at a distance, are part of. As a result, the use of Information and communications technology (ICT) is inevitable and constitutes a crucial factor for its implementation (Adamides and Karacapilidis, 2020).

In OI, external knowledge integration and learning are associated with the organisation's *dynamic capabilities* (Teece et al., 2016) (*sensing* the environment, *seizing* opportunities and *transforming* its innovation process(es) and value offerings), while their effectiveness depends on the organization's level of *absorptive capacity* (ACAP) (Cohen and Levinthal, 1990), as well as on its degree of *"active transparency"* (Adamides and Karacapilidis, 2019), which may be defined as a form of *generative sensing* (Dong et al., 2016). Active transparency refers to an active organisational interface that identifies, collects, filters and distils internal and/or external knowledge before it is integrated in the existing organisational knowledge base. In this line, it supports the collective development of hypotheses about problems and their innovative solutions – in general, hypotheses about the possible use and effects of incoming and outgoing knowledge items – as well as the testing for their validity. As it was already mentioned, active transparency is a compound capability that is constituted by the component capabilities of generative sensing and argumentation. *Generative sensing*, in turn, is founded on the micro-capabilities of *framing* problems/issues and selecting/inferring their solutions using an *abductive logic* (abduction) (Dong et al., 2016). On the other hand, argumentation schemes influence the proposition-setting and selection/decision-making processes by regulating the relative power (positional and rhetoric) of participants and their arguments (dominant argumentation logic/repertoire).

In open innovation, once a proposition is framed collectively in an argumentative fashion, its validity then needs to be tested through abduction. Abduction is a form of logical reasoning in which hypotheses/propositions, which are intuitive "guesses" (and not necessarily logically sound) are introduced and then validated through testing (Dong et al., 2016). The proposition is a hypothetical mechanism (the product of abduction), which, if it existed, would generate (would be responsible for) the observed phenomenon/problem, or a phenomenon different from what was normally expected (Papachristos and Adamides, 2016). The proposition may be the result of argumentation and thus logically sound, as far as the collective process is concerned. However, most likely, it will be unfounded regarding its actual content, since most participants have limited, or no, knowledge of the specifics of the issue/problem and the context around the issue (Androutsopoulou et al., 2018). In this way, argumentation on these proposals produces knowledge.

There have been direct and indirect calls for embedding argumentation and productive conflict resolution in open innovation processes and their technology-mediated implementation (Battistella

and Nonino, 2012; Cui et al., 2015; Malhotra and Majchrzak, 2016; Bogers et al., 2017; Osorno and Medrano, 2020). Argumentation is a knowledge integration/combination and creation activity that needs to be part of platforms supporting different forms of open innovation and the associated dynamic capabilities (Adamides and Karacapilidis, 2019). As argumentation and conflict resolution processes (e.g. voting) are inscribed in the technology, the adoption of such systems by an organisation implies the adoption of the specific form of argumentation supported in the system, and the introduction of its logic into the specific organisational context. Obviously, this may lead to contradictions between the existing structures and practices and the structures and practices inscribed in the system. Hence, prior to the introduction of computer-supported OI, the form of argumentation inscribed should be analysed and the appropriate modifications in organisational practices and structures must be made. Alternatively, the OI supporting ICT system may need to be designed taking into account the institutionalised practices, if change is not desirable.

3 ARGUMENTATION SCHEMES AND ORGANISATIONAL CONTEXTS

In general, the purpose of an argument is to show that a non-trivial assertion (a proposition whose validity is not obvious without further details and cannot be proved or verified easily by evidence) may claim validity (von Werder, 1999). Argumentation is a context-based sense-making process, which varies according to (socially) constructed rules and the structure of related (social) groups. In the context of this paper, argumentation is considered as a logic- and evidence-based persuasion activity that differs from persuasive discourse which is a purely verbal exercise (Karacapilidis and Gordon, 1995; Jarzabkowski and Silince, 2007; Balogun et al., 2014; Bednarek et al., 2017). According to Bloor (1980), in a specific social/organisational setting, standing out by their frequency (e.g. seeking argument justification with reference to a specific report, or with reference to what the industry leaders do, etc.), characteristic forms of argument will emerge. Inevitably, this gives each social (organisational) structure its dominant argumentation repertoire of explicit legitimation, which solidifies and increasingly constrains social and organisational behaviour, and is used for characterising and evaluating actions, events and other organisational phenomena "which are often organised around specific metaphors and figures of speech" (Potter and Wetherell, 1987). As a result, institutionalised justifications exist as objective, widely available rules, and, directly or indirectly, tell organisation members how to argue effectively (Sillince, 1999).

Clearly, the institutionalization of an argumentation form/scheme is not a positional- and rhetorical-power-neutral process, neither a static one. Frequently, in innovation production processes, in proposing innovations and solutions to issues, organisation members with high positional power need not justify their arguments extensively, while those with rhetorical power, which is frequently related to the positional power, as far as access to the audience is concerned, may bias the organisation discourse, both in short and long term, towards specific forms that have more affinity with the institutionalised argumentation forms, undermining other forms which may include more substantive arguments. In fact, this is one of the drawbacks of "closed", organic innovation and at the same time a sign for caution for open innovation.

Argumentation for postulating (innovative) propositions should encourage external actors to contribute providing them with sufficient power to support their arguments by using a variety of justification/claim logics. ICT can contribute to this objective by sealing off and objectifying these processes from their actual social/organisational context and power distribution in a controlled manner (Kallinikos, 2011. In this direction, different OI platform designs of varying complexity and features have been proposed, mainly to capture ideas in different formats. However, so far, only few, in specific modes of OI, such as crowdsourcing and innovation contests that involve end-customers/consumers, support more complex tasks, such as productive cooperation and knowledge integration (Malhotra and Majchrzak, 2016), not mere expression of ideas.

Many argumentation models (formalisms) have been proposed in the literature, especially in connection to computer-supported argumentation systems (Bentahar et al., 2010). Gürkan et al. (2010) integrated three such formalisms (IBIS, the Toulmin framework, and the concept of argument schemes of Walton) in an inclusive model, which consists of the *problem/issue* in hand, the *ideas/proposals/positions* for its solution, and *pro and contra arguments* related to proposals. Pro and contra arguments are

justified by *claims* consisting of *grounds* and *warrants*. Pairs of grounds and warrants define four main *argument schemes* (which are related to the argumentation repertoires mentioned above), namely, arguments based on *expert opinion* (accept claim because someone is an expert), *popular opinion* (something is generally accepted as true because it is generally accepted as true), *analogy* (A works because it resembles B that have been proven to work in the past) and *causal associations* (A works because B works, and there is a positive correlation between the two). Argument schemes as parts of dominant argumentation repertoires influence decision-making in many organisational aspects, including the innovation process.

In the innovation process, the quality of propositions and the knowledge/insights produced is a function of the argumentation rationality and process, i.e. the thoroughness of the proposition preparation as revealed by the arguments put forward to support it (von Werder, 1999). Connecting the issue of power to the aforementioned argumentation models, abuse of positional power means that the proponent does not justify claims and/or pro/contra arguments, or does not justify the selection of a specific argumentation scheme, or does not justify the issue of specific rhetoric arguments, or even does not justify the truth of warrants.

Similarly, the abuse of rhetorical power implies that the proponent knows how others react to rewards and practices rhetoric argumentation accordingly, giving little emphasis on the validity and truth of arguments and statements ("populist" behaviour). Such behaviours result in effectively weak arguments and shaky propositions distorted by power relations associated to the different forms of capital (economic, bureaucratic, organisational, technical, informational) that each actor possesses (Bourdieu, 1990). As a result, the outcome of the knowledge integration effort and innovation will not necessarily match the organisation's strategic needs. The selection of an appropriate argument scheme, which is consistent with the organisational context, i.e. objectives, power structure, and decision processes, is crucial in mitigating these distortions.

Following, we discuss how Activity Based Analysis (ABA) can be employed for the assessment of this match, as well as to indicate areas of intervention for improving it.

4 ACTIVITY THEORETIC PERSPECTIVE OF ARGUMENTATION PRACTICES

In a practice perspective, the analysis of innovation process (activities and their context) can be accomplished using the properties of Cultural and Historical Activity Theory (CHAT) (Engeström, 2000a), which is an upgrading of the original activity theory, by introducing a more systemic construct, the activity system, which includes the context in which activity/practice take place. The central tenets in CHAT are *mediation*, which means that all practices/activities, at all levels of analysis, are accomplished through a range of ideational constructs and material artefacts that originate from a cultural heritage of social milieu (the context) (Nicolini, 2013), and *contradictions*, which are the means through which activities change and lead to innovations in practices and mediating tools.

Each activity system has a *subject* that carries (and is carried out by) the activity (depending on the level of analysis, a person, organisation, etc.). *Object(ive)* is the problem space to be transformed by the activity into an *outcome*. *Tools/instruments* are the mediating means (technological artefacts or other "softer" means, such as language, signs, or argument schemata in our case) through which the activity is carried out. The transformation of the object is possible only through these historically developed means, which also participate in the construction of the identity of the subject. *Rules* are the cultural norms, rules, etc. governing the performance of the activity. The *community* denotes those who have interest and are involved in the activity, while the *division of labour* signifies who is responsible for what, who does what, and how roles and power hierarchies are organised. Activities are long term phenomena with no clear-cut beginning and end. They produce (lower-level) activities and are realised by means of actions, but, as an emergent phenomena, are not reducible to actions and operations (Engström, 2000b). Contradictions are historically accumulating structural tensions, principally originating from interaction with, and influence from, other activity systems. They are identified as tensions in, or between, the elements of the activity (e.g. between objectives and instruments), or between activities, and are responsible for disturbances at the level of activity.

ABA (Yamagata-Lynch, 2010) is an organisational change analysis method, in which the

activity construct is applied to activities at different levels of detail for identifying contradictions and initiating remediating actions to facilitate change. Activity-based analysis of organisational phenomena is based on a number of ontological and epistemological assumptions. The main ontological assumption is associated with its underlying practice perspective, i.e. the assumption that the world is made and remade in practice, using tools, discourse and our bodies. In addition, practice theories emphasize the role of interests in human behaviour and hence they take explicitly into account power, conflict and politics in the analysis of social reality (Nicolini, 2013). Hence, activity theory maintains that these are the determining factors of change and innovation in organisations and may be employed strategically to induce change.

There has been a debate concerning the structure and the constituent parts of organisational activities, focused on the nature of the subject of activities, i.e. whether individual or collective (Blacker et al., 2000; Thomson, 2004). However, the constructivist epistemology and the "systemness" of the activity construct transcends this debate and implies that the principal unit and departing point of analysis should be a single activity corresponding to the emerging behaviour of an organisational unit/function or process (with a collective subject) (Engeström, 2000b), e.g. the activity of argumentation in the innovation process exercised by those involved in the process.

As the analysis proceeds by considering the historical development of activity and questioning whether changes are, or will be, the result of the multi-voiceness characteristic of the activity (endogenously emergent deviant practices), or have been introduced by other connected activities, which participate in the construction of the elements of the focal activity, activities unfold. If the sources of change are internal, the process continues by considering activities of specific actors. The contradictions developed are identified and the mitigating actions are investigated in relation to the subjects involved. It is important to understand the conflicts and the power distribution among those involved in activities. On the other hand, if the sources of change are external activities, first, it is important to investigate their relation with the central activity, then to define their elements and find out which of them have been changed, and how these changes influenced the central activity. The inquiry continues by investigating whether these changes were the result of internal developments or were caused by another activity, and the process continues as above. The whole process follows an abductive inference mode (Papachristos and Adamides, 2016) trying to identify the contradictions and remedial actions that lead to a plausible causation for the final/current state of activity. In more analytical inquiries on the role of (information) technology in organisational interventions and strategic change, the methodological aspects of the philosophy of science of critical realism can be employed along with activity theory (Allen, et al., 2013; Simeonova, 2018).

Obviously, the above process is more suitable for investigating organisational change and information systems strategy retrospectively. However, activity theory can also be used when an organisation is planning change; either because a number of issues have arisen with the existing structure and practices (and their relation to technology), or because changes are planned to improve operations. In both cases, the basic procedures of the Change Laboratory (Engeström, 2007) and Activity Based Analysis (Yamagata-Lynch, 2010) can be employed. Both methods begin with an analysis of the existing situation, drawing and examining related activities in a top-down or/and bottom-up fashion, as the inquiry unfolds, and then proposing new forms of activity and testing them. When the process concerns planned change, changes are mapped into activity models of the existing practices, possible contradictions are identified, and changes are proposed, discussed and finally decided to be implemented. Change Laboratory is a participative synchronous method whose main objective is learning from the process per se. ABA, on the other hand, aims at results, and parts of it can be accomplished off-line.

In the context of innovation, an activity representation of the entire innovation process (Figure 1) would have, for instance, the Innovation Executives Council or the R&D department as subject and the specific innovation issue/problem as the objective. The task of innovation as a (re)solution of an issue (*object(ive)*) would be carried out by decisions taken by the *subject* in an argumentative manner employing the organisation's dominant argumentation repertoire (e.g. based on expert opinion) and other *tools*, such as Powerpoint slides, documents, prototypes, etc., influenced by the *division of labour* (distribution of expertise and power), in a *community* of stakeholders (top executives, other departments, suppliers, etc.), and in accordance with a set of formal and informal (organisation) *rules* (e.g. proposals should be in written form, confidentiality should be guaranteed). The product of the innovation process (product, service, process, etc.) would be the outcome of the activity.

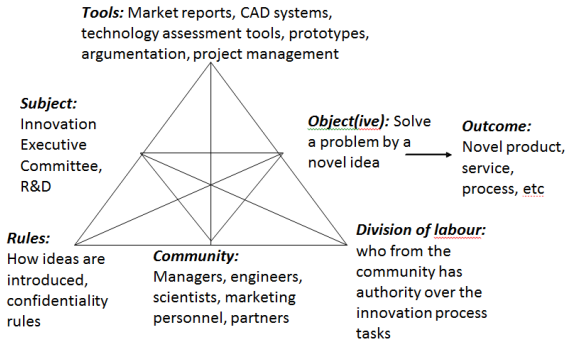

Figure 1: Activity-theoretic representation of (closed) innovation.

The argumentation activity (Figure 2) is a lower level activity within the innovation activity (or within a specific innovation phase activity, e.g. commercialisation and value appropriation). The person or the collective entity (the *subject* of the activity) is engaged in the argumentation activity (practices argumentation) in the innovation process to persuade her audience that her proposition is right and has value. This is the *object(ive)* of the activity and its successful accomplishment produces the *outcome* of the activity. The subject uses an argumentation scheme/logic to transform the object. This is the *instrument/tool* of the activity and mediates the relationship between the subject and her object to persuade, i.e. persuasion is through argumentation. The context of the argumentation activity includes the process or argumentation, i.e. how arguments are placed, evaluated and selected (the *rules* of the activity). These may be formal rules or just habitual rules. It also includes the *community* of all interested parts (principally the audience of the arguing subject), and the *division of labour* that determines who has the right to place arguments, who to support arguments, etc.

The activity theoretic representation of argumentation and its context includes all the elements of the context-embedded argumentation model of Sillince (2002), however in a *systemic* and theory-grounded way that can be easily employed for analysis in empirical settings. The subject of the activity is the *arguer*, the rules are the *setting*, and the community is the *audience* of Sillince's model, respectively. The object of the activity is the topic, whereas the *content, form* and *integration* in the model of Sillince are represented in a compact form in the instrument/tools element and its cultural historical development. The *strength* of the argument is the outcome that denotes its effectiveness.

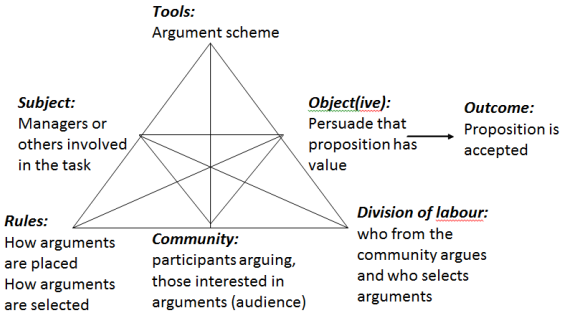

Figure 2: Activity-theoretic perspective of argumentation.

In the following section, we present a case study of an organisation adopting an Open Innovation strategy. ABA is employed for understanding the role of the alignment of argument schemes/dominant argumentation repertoires with the OI model adopted, so that active transparency is enabled.

5 A CASE STUDY OF ARGUMENTATION PRACTICES IN OPEN INNOVATION

5.1 General

The case concerns the introduction of open innovation though the adoption of an ICT platform by COFFEE ISLAND S.A. a company operating in the food and beverages sector in Greece. The reason for the development of the case was to learn and gain understanding about the relationship between the context of the innovation process and the (dominant) argumentation scheme(s) implemented in an open innovation platform to be adopted by the company.

COFFEE ISLAND was established in Patras, Greece, in 1999. From the very beginning, the vision of the company was to introduce an innovative, brand-new coffee concept, which would not be centered on just selling coffee products, but would provide a unique coffee experience to the end-customer and would turn the art and craft of making artisan coffee into science. COFFEE ISLAND is currently one of the most established coffee chains in Europe; as of today, it runs more than 470 stores in 6 countries, performs direct green coffee trade with 10 countries and retains 3 proprietary production units. The company offers a successful and valid business model through fair practices and by targeting win-win collaborations. As proud supporters of fair company practices, this model is

based on collaboration between the investors and the franchisees that want to start a new enterprise.

COFFEE ISLAND has gained a unique positioning by strategically developing a differentiated concept and by combining the premium quality of a specialty coffee grindery with the accessibility and affordability of the modern, all day coffee shop that provides unique coffee to unique people. COFFEE ISLAND's shops reflect the brand's ethos, culture and evolution throughout the whole coffee journey and are the customers' favorite place for their morning cup of fresh-roasted specialty coffee, lunch break, light meals and leisure home consumption coffee experience.

5.2 Methods

The case is the result of an action research project in which both company executives and academic personnel, informally acting as consultants, were involved. The research followed the generic procedures of Change Laboratory (Virkkunen et al., 2010) and Activity Based Analysis (Yamagata-Lynch, 2010). Activity diagrams were developed off-line after five structured discussion sessions took place. Notes were taken and were used in the analysis. The current situation of closed innovation activities was based on information provided by the company executives, whereas the open innovation ones on the features and use scenarios of an innovative OI platform under development, which was presented to, and discussed with, the company executives and technical consultants. The interventions which are discussed below were proposed by the company executives.

5.3 Description of the Case

COFFEE ISLAND is the leader domestic coffee roaster, as well as the owner and franchisor of brand corner coffee shops, operating more than 400 shops in Greece and abroad. Although the child of a single entrepreneur, the company operates as a multi-shareholder private company with a formal R&D and Innovation department, involving actively in its operations and innovation initiatives shop managers and suppliers (in a variety of product and service aspects). Innovations mainly concerned products (flavours and mixes), outlet layout and operations.

The company intended to switch to the open innovation model through the use of an ICT platform for supporting the entire innovation process. Currently COFFEE ISLAND keeps open channels with, and listens to, external partners and stakeholders, such as suppliers, franchisees, consultants, consumers etc., for ideas concerning the innovation process. However, all ideas and proposals are mainly filtered by the management of the company in a top-down fashion without much interaction between proponents and management. Limited feedback is provided and only short discussion of ideas takes place. Therefore, in actual fact, no diverse external knowledge is used, the active transparency of the company is weak and the decision making process is not clear enough. For the management of COFFEE ISLAND, this is the main reason for embracing the open innovation model though the introduction of an open innovation ICT platform that will engage and support the productive cooperation of internal and external stakeholders in the innovation process.

As far as the argumentation used in innovation is concerned, the existing dominant scheme is close to the forms of causal association and analogy. The argument for accepting a novel proposal, idea, etc. is that it is in accordance with the values, the vision and the strategy of the company, as they are expressed in the documents and the discourse of the company, and monitored by its executives. This secures the closeness of the innovation with the Brand DNA and scores as one of its main priorities. This scheme can be considered as causal association because claims are associated with the above triptych (values, vision and strategy) which was the claim and the reason that other innovative ideas proved to be effective for the company. It is also close to the scheme of analogy because frequently reference is made to other resembling situations of products, processes, etc. that are in line with the values, the vision and the strategy of the company and proved to work (assuming the existing values, vision and strategy contribute to the wellbeing of the company).

In a move to a more open innovation model, COFFEE ISLAND is intending to adopt a mixed contest/crowdsourcing and innovation community model that will take advantage of the company's presence in the social media as well. The crowdsourcing model will engage end customers, whereas the innovation community will be addressed to more commercial partners, such as suppliers, advertising agencies, consultants, etc. As the critical mass of participants of the innovation process will be increased, it becomes apparent that an argumentation scheme consistent with increased participation, direct interaction and well-defined processes need to be introduced. Gradually an argumentation scheme based on popular opinion will

become the core of COFFEE ISLAND's open innovation process argumentation repertoire. In this way, it will enable active transparency and result in successful innovations in the enhancement of customer experience in the shops, in novel products and business, but also in the operational processes of the company. Activity Based Analysis was used to identify the possible contradictions that will arise between the characteristics of the new argumentation scheme and the innovation context in which argumentation is exercised.

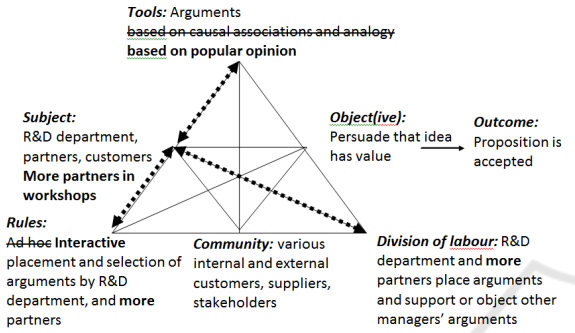

Figure 3: Argumentation in innovation process before and after.

Figure 3 presents the employment of Activity Based Analysis in the argumentation sub-activity of the innovation process/activity. The secondary contradictions between the subject(s) and the rules (more partners in workshops need to place arguments in a sort of synchronous manner), between the subject(s) and the division of labour (more partners need to have the power to place and support arguments), and between the subject and the tools (the argumentation of a wider multitude should be supported and taken into consideration in a different way) in the initial argumentation activity, after the decision for more open innovation, are depicted as bold dotted lines. In effect, the three contradictions will be remediated by institutionalizing a different argumentation scheme based on popular opinion. This implies that the company has to open and democratize its innovation process. This can be accomplished in different ways with the help of the ICT platform. In addition to objectifying the rhetoric of argumentation, by assigning different weights to different positions and roles, a power structure with respect to argumentation can be inscribed into the platform. Again, bold letters in the labels of the elements of the activities indicate the new state of the elements that resulted in the resolution of the contradictions.

6 CONCLUDING REMARKS

As innovation is in fact the result of propositions and argumentation, successful innovation relies on the quality argumentation. Argumentation of high quality means that the way propositions and arguments are placed and the way they are evaluated and selected are consistent with the context of argumentation, which, in turn, is contingent to the innovation strategy chosen. In the case of Open Innovation, argumentation is a constituent part of the active transparency capability that determines the way external knowledge is selected and integrated in the innovation process. Argumentation is a complementary capability to the generative sensing capability which employs abductive inference logic that depends on evidence. Hence, it differs from pure discourse-based rhetorical acrobatics, and its process should be supported by its contextual elements in a consistent way.

In this paper, we introduced an activity-theoretic representation of argumentation practice and its context. The importance and distinct features of activity theory, and its corresponding activity-based analysis (ABA) (and Change Laboratory), lie in the concepts of *mediation* and *contradiction*. Mediation is the manifestation of an inclusive relation between agency acting towards an objective (persuasion) and the (material and ideational) artefacts (argument scheme) and the social context that surrounds this agency in action (when arguing). This means that this activity cannot be considered independent of the technology and artefacts associated with, neither from the social context (the stakeholders with their power relations and division of labour) in which it takes place. Hence, in considering argumentation in the innovation process, structure and agency are interlinked into a single inseparable construct (activity).

In addition to offering a holistic and symmetrical perspective to think and know about argumentation schemes and dominant argumentation repertoires in (open) innovation, activity theory is associated with structured inquiry processes (activity-based analysis and Change Laboratory). The inquiry is based on a compact operational unit of analysis (the activity (triangle)) with internal and external causality relations (mediation) and does not rely on just correlated parameters and metrics. Through the identification of contradictions, the structure of activity and its relations with other activities, leads to assessing the consistency of the argumentation scheme exercised and the context defined by the innovation strategy and diagnosing any

contradictions. This logic can operate in the reverse direction, when a change in strategy is planned and needs to be managed. Artefacts, or more generally contextual mediating elements, can be used strategically to bring about change in a manageable way.

Through the presentation of a case study of argumentation in the adoption of open innovation strategy, our objective was not to provide a data-rich extensive presentation of the development of the relations and contradictions between argumentation schemes and OI models in particular settings, but to highlight methodological issues, i.e. how to think about these relationships when adopting an innovation strategy and open innovation in particular.

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