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Argumentation Schemes in Technology-Mediated Open Innovation Product-Service Models: An Activity Systems Perspective [†]

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Abstract: The paper uses activity theory for understanding and managing the complexity involved in the transition of a product-service organization from closed to the technology-mediated open mode of innovation. In particular, activity theory is used to facilitate the alignment of the open innovation model adopted with the organization's dominant argumentation scheme by developing nested representations of the innovation process in the traditional closed mode, as well as in the user-led innovation and user co-creation modes, associated with product- and service-provision operations, respectively. For all cases, we concentrate on the argumentation-in-innovation activity and its context. We arrive at insights about the process of Activity Based Analysis (ABA) in this endeavor and the issues raised through action research in a product-service firm in the food and beverages sector, aiming at adopting an open innovation strategy implemented in the innovation community mode.

Keywords: open innovation; activity system; technology-mediated argumentation; user-led innovation; co-creation



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1. Introduction

Over the last twenty years, open innovation (OI) has been established as a widely accepted model of organizing innovation activity [1,2]. As a result, OI 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 [3,4]. The adoption of open innovation [5] by an organisation implies that the organization and its innovation process [6–8] become porous, and ideas, concepts, designs, products, services etc. flow in and out of its boundaries. In this way, different knowledge sources associated with internal and external organization actors become interconnected in many different ways, and information and knowledge items of various forms flow between them, being transformed for the development of products and services [9].

So far, many attempts to adopt OI have been successful and rewarding. However, many others have been problematic [10,11]. Naturally, OI adoption is easier in large firms that have an abundance of appropriate resources, and difficult in SMEs that lack them. However, despite size, the adoption of OI in a productive way is associated with the availability of a number of organizational characteristics, of which the existence of an appropriate organizational culture plays probably the most prominent role [2,11,12]. The way organizational agents propose their ideas and expertise, and how they argue for them, is an important part of organizational culture. In the OI model, novel ideas, as well as propositions for novel technologies, products, services, etc. stem from diverse sources and may be contradicting and in conflict with other, explicit or indirect, proposals.

In fact, they are arguments with supporting evidence, which have to be evaluated and accepted, or at least accommodated, in a collective manner within the specific organizational context [13]. In this context, specific forms of argument exercised frequently, or those placed by powerful actors, become dominant argumentation schemes and characterize the organizational discourse [14] and organizational culture, in general, and the innovation processes, in particular.

As OI may be implemented in several different models (innovation communities, innovation markets, innovation contests and innovation toolkits [15]), each with its specific peculiarities, as far as organizational processes and culture are concerned, it is of particular importance to align the innovation dominant argumentation scheme to the specific OI model adopted, within its specific context [16]. In addition, as ICT is the enabler of most of the above models, the development of an Information System (software platform) to implement OI should consider, as well as inscribe, organizational characteristics of the company, including its dominant innovation argumentation scheme, which depends on the existing company's business model, or the one to be adopted. Towards this end, there have been direct and indirect calls for consistently embedding argumentation and effective conflict resolution in open innovation processes and their technology-mediated implementation [3,7,17–20].

In this direction, adopting a socio-technical systems perspective, in this paper, we use activity theory to provide insights on the alignment of the OI model adopted with the dominant argumentation scheme of an organization's innovation process. We demonstrate how activity theory employed in action research setting can facilitate this alignment in the transition from close to open innovation, especially in the case of a company implementing a mixed product-service business model. The contribution of this paper is fourfold: First, it surfaces the issues involved in the alignment of the dominant argumentation scheme of a firm with its innovation model, particularly in the transition from closed to ICT-mediated open innovation. Second, it reveals the issues that the existence of different argumentation schemes within the same organization may raise in the implementation of technology-mediated OI. Third, by developing an activity model for argumentation in the innovation context, it introduces and discusses Activity Based Analysis (ABA) as a holistic and consistent way with a sound theoretical base for approaching these issues under a socio-technical systems prism. Fourth, it demonstrates through action research how ABA can contribute to the conceptualization and adoption of an Information System that facilitates the practice of argumentation-driven knowledge management in OI.

Following, in Section 2, we discuss argumentation in knowledge creation in the open innovation process. In Section 3, we develop on argumentation as functional specification and embedment challenge of Information Systems in organizations adopting the OI model. In Section 4, we introduce activity theory and ABA in action research setting, as well as an activity-theoretic model of argumentation practices in innovation accompanied by a related process/method for investigating the impact of interventions in organizations. In Section 5, we employ ABA in an action research setting concerning the development of an IS for implementing OI in a coffee roaster and coffee shop franchisor company (mixed product-service business model) that intends to switch to technology-mediated open innovation strategy. The case concentrates on the analysis of contradictions which develop between argumentation schemes implemented and their contexts, and on the organizational interventions necessary for their resolution.

2. Argumentation, Knowledge Creation and Open Innovation

Naturally, innovation (and also new product and/or service development) has been directly associated with knowledge creation [1,12,21,22]. As it was depicted above, in the open innovation model, innovation is the result of co-creation of knowledge by internal and external organizational agents [4,23–26]. Although may be well integrated into the firm's organizational processes, external knowledge sources usually belong to the epistemic periphery with respect to the firm's core knowledge base and learning interests. Such

diversification of external knowledge sources is a much sought after property, but their integration in organizational learning through argumentation may be rather problematic due to different contexts and argumentation schemes practiced [25]. Developing and inducing an appropriate common argumentation scheme in line with the surrounding context is a significant step in solving this problem.

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 [27]. Argumentation is a context-based sense-making activity, which varies according to (socially) constructed rules and the structure of related (social) formations. 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 [28–30]. On the other hand, argumentation can be thought of as a critical context-dependent activity in knowledge (co)creation as it supports the productive integration of diverse knowledge sources [21,31]. It provides structure and outcome to dialoguing, thus placing interaction at the center of knowledge creation [32]. It also drives knowledge (co)creation as the support of claims requires externalization of individual explicit and tacit knowledge, and as conflict resolution of opposing arguments requires the accommodation of views and integration of knowledge items [18,31,33].

Many argumentation models (formalisms) have been proposed in the literature, especially in connection to computer-supported argumentation systems [34]. The authors of [35] 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).

In a specific organizational 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 emerge and are institutionalized [36]. Inevitably, this defines each organization's dominant argumentation repertoire of explicit legitimation, which solidifies and increasingly constrains social and organizational behavior, and is used for characterizing and evaluating actions, events and other organizational phenomena "which are often organized around specific metaphors and figures of speech" [14]. As a result, institutionalized justifications exist as objective, widely available rules, and, directly or indirectly, tell organization members how to argue effectively [37]. Argument schemes as parts of dominant argumentation repertoires, depending on the context employed [38], influence decision-making in many organizational domains, including the innovation process.

Clearly, the institutionalization of an argumentation form/scheme is not a positional- and rhetorical-power-neutral process, neither a static one. Frequently, in innovation processes, in proposing ideas and solutions to conceptual and technical issues, organization members with high positional power need not justify their arguments extensively. In addition, others with rhetorical power, which is frequently related to the positional power, as far as access to the audience is concerned, possibly for purposefully hiding knowledge [39], may bias the organization discourse, both in the short and long term, towards specific forms that are closely related to the institutionalized argumentation forms, undermining other forms which may be based in more substantive arguments. In fact, this is one of the drawbacks of "closed" innovation, and at the same time a sign for caution for open innovation. Argumentation for postulating (innovative) propositions should encourage external actors to contribute what they know, 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/organizational context and power distribution in a controlled manner [40,41]. In addition, it can induce logical consistency through objectification in the argumentation, reducing knowledge hiding [39]. 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, not mere expression of ideas [18].

On the other hand, in practice, OI has been implemented in many different modes [15,42]. In innovation markets, “sellers” and “buyers” of innovation, or “problem setters” and “problem solvers”, interact to obtain the best for their part, whereas in innovation communities many different actors work on the same or similar problem(s) provided by the host company or other third parties. In innovation contests, organizers (firms or other organizations) place problems and potential solvers compete for the rewards for the “best” solution, whereas in innovation toolkits, solvers follow specific procedures and guidelines, frequently implemented in a software tool, to provide solutions to the host company. These four models are generally referred as co-creation models [24,43] and differ from user-led innovation [44] or the so-called “push model” of OI [45], in which users innovate independent of the producing firm, to solve problems with the products/services they use. Frequently user-produced innovations are adopted by the producer firm and are integrated into its products/services.

Specific argumentation schemes are more suitable for specific OI models and their context. Deciding the appropriate argumentation scheme for a specific OI model implemented though ICT is an issue whose consideration requires a holistic socio-technical systems approach [46]. As we depict in the following sections, the inherent socio-technical nature of activity theory makes it a very suitable tool for this endeavor.

3. Argumentation in Information Systems for Open Innovation

As it is already mentioned, the technical characteristics of the Information System employed and the way it is embedded in organizational processes should be in line with the model of OI adopted. In the innovation market model, “users” of innovations (in technologies, products, services, processes, etc.) ask for offers by “producers” and select what fits them best according to the rules of the market. “Producers” may act pro-actively and develop innovations that are then available in the market seeking potential customers. An IS to support this model should have functionalities for defining requests (demand) and responses to demand, and for matching them. Innovation communities, on the other hand, are a more loosely structured model, whose scope, however, may be quite limited (e.g., related to a specific model of a product line). Technology defines the functionalities of an open forum where multi-role participants offer solutions, or ask for solutions, or just discuss/comment on solutions. The system may support different degrees of openness, i.e., participation may be restricted and controlled by the system, or alternatively, ad-hoc users may also participate and use the knowledge collectively built in the community. Innovation contests are more specific, as far as the scope and the extent of the innovation process is concerned. They are usually focused on specific issues supplied by the host company that expects to receive ideas, rather than more mature innovation concepts. Finally, innovation toolkits is a closely controlled by the host company model, in which the community of innovators is guided in the solution of a specific problem, or in providing ideas, etc. in a specific form. Clearly, in all cases what is required by the IS, is to actively support the production of knowledge, rather than to provide a platform to record a parade of ideas and information in raw form.

An IS for open innovation should support different stakeholders of OI with different requirements, located at different “distances” from the firm’s core innovation activities [17]. Core inside innovators have innovation in their job description [15] and are assigned the

task of creating knowledge and innovative artefacts. Clearly, they are involved in the majority of the stages of the innovation process, and the IS must provide them with a rich environment, as far as representational formalism and interaction are concerned. In an outer circle, there are peripheral insider innovators who contribute to the innovation process in an ad-hoc manner and who frequently act as lead users of innovation. They require a rich interface with the core innovation process and its actors and support for the expression of their views in an argumentative manner, and for participating in decision making. Outside innovators are individuals and organizations not directly associated with the focal firm, the production of innovation excluded [15]. Depending on the model of open innovation adopted, the IS should offer them appropriate functionalities, including support for the argumentation scheme adopted.

To understand the requirements of IS for supporting OI, sometimes it is more useful to refer to the distinction between user co-creation and user-led innovation. In the former model, core inside innovators, peripheral inside innovators, as well as outside innovators are driven by a company issue to collectively create knowledge for innovation. In the latter, principally outside innovators (sometimes peripheral inside innovators too) independently produce knowledge which may be used at a later stage by the production company, or a different company [43]. The incentive for innovating is, at least initially, their own benefit, e.g., to customize a product for more efficient use in their operations. As the newly produced knowledge becomes publicly known, other companies, organizations in general, may use/exploit this knowledge. Hence, in the context of technology support for OI, in the former case, the objective is to implement an IS that facilitates knowledge co-creation, whereas in the latter, a system that facilitates knowledge creators to communicate and argue for (usually “expert opinion” or “analogy” argument schemes) the knowledge/innovation they produced, and users to be able to scan the environment, in which independent creators are part of, and to integrate the knowledge the latter produce in their products, services and processes.

The development and embedment of such IS in the knowledge creation and exploitation organizational processes of companies which had previously implemented conventional closed innovation systems processes, using ICT or not, is a complex challenge that requires a socio-technical perspective. On the other hand, argumentation is a knowledge creation through knowledge integration and/or (re)combination activity that needs to be part of platforms supporting different forms of open innovation, contributing thus to the development of the corresponding dynamic capabilities [31]. As argumentation and conflict resolution processes (e.g., voting) can be inscribed in the technology, the adoption of such systems by an organization implies the adoption of the inscribed specific form of argumentation and its logic, adjusted to the specific organizational 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 technology-mediated OI, the form of argumentation inscribed should be analyzed and the appropriate modifications in organizational practices and structures must be made. Alternatively, or in parallel, the OI-supporting ICT system may be tailored to the institutionalized practices, if extensive change is not desirable.

These IS development and embedment challenges become greater when one has to deal with mixed product-service business models. Product-service business models should not be confused with Product Service Systems (PSS) offered by manufacturing companies. In the latter case, through a single channel, manufacturers are offering support and additional value (maintenance services, add-ons, etc.) to their customers throughout their products lifecycle [47]. Customers buy products and services. In the case of the product-service business model, customers buy either products or services, or both, however in distinct transactions. There are two distinct offerings.

In services, in general, there is more interaction between the providers and consumers, and more transparency, as far as their production is concerned. Concerning open innovation, actual service providers, such as employees and/or franchisees, act as intermediaries

between end customers/users and management. They are the source of innovation, which frequently originates from improvisations they make in the provision of service, and which may be unnoticed, unless they promote it, or the production company has the appropriate scanning procedures to spot it. In OI, their interaction with the company is asynchronous and resembles the user-led innovation model and the corresponding IS requirements depicted above.

Following, we discuss how Activity Based Analysis (ABA) can be employed for the assessment of the match between technology-mediated OI model and argumentation scheme, as well as to indicate areas of intervention for improving it through the resolution of the contradictions developed.

4. Activity Theoretic Analysis of Argumentation Practices in IS for OI

In a practice perspective, the analysis of innovation process (activities and their context) can be accomplished by action research using the properties of Cultural and Historical Activity Theory (CHAT) [48]. CHAT 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) [49], and contradictions, which are the means through which activities change and lead to innovations in practices and mediating tools.

Turning into the specific context of our study, probably the major advantage of using Activity Theory in IS-induced change, of any form, in the innovation process, is its socio-technical perspective that includes technology and social/organizational aspects into a single unit of analysis [46,50–52]. So far, activity theory has been employed in Information Systems studies in two directions: either to understand IS intervention in organizational processes and explain how IS drives change [16,53], or to facilitate the design and development of IS [54,55]. In the former, the social aspects of IS prevail, whereas in the latter technical issues are in focus [51]. As activity theory adheres to the socio-technical systems paradigm, according to which actors shape technologies while being continuously shaped by technologies [52,55], the contribution of activity theory is greater when the above two streams are employed in a dialectic fashion, and in a top-down refining way: initially to understand how the employment of IS leads to change in organizational processes in a specific situation and what new possibilities and constraints exist, and then, to find IS functionalities (design specifications) that allow the exploitation of these possibilities.

The subject(s) of an activity is the person, or organization (participants of the activity), that is involved in carrying out the activity. Object(ive) is the reason that the activity takes place, the problem space to be transformed by the activity into an outcome. Tools/instruments are the means (technological artefacts or other means, such as language and signs, or argument schemata in our case) by which the activity is being carried out (or mediated) and the transformation of object is achieved. 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, i.e., the object shapes the subject too—if the objective is a particular type of innovation, the subject is a particular type of innovator. Rules are the cultural norms, rules and regulations governing the performance of the activity, whereas community denotes the environment in which the activity is carried out, and division of labor signifies who is responsible for what, and how assigned roles are organized. The outcome of the activity is the desired outcome from carrying out the activity (Figure 1). It is important to note that in Engeström's activity model the community and the rules are the carriers of the influences of the social context on the agents (subjects), whereas the tools and the division of labor denote the ways of thinking and acting imposed by technology.

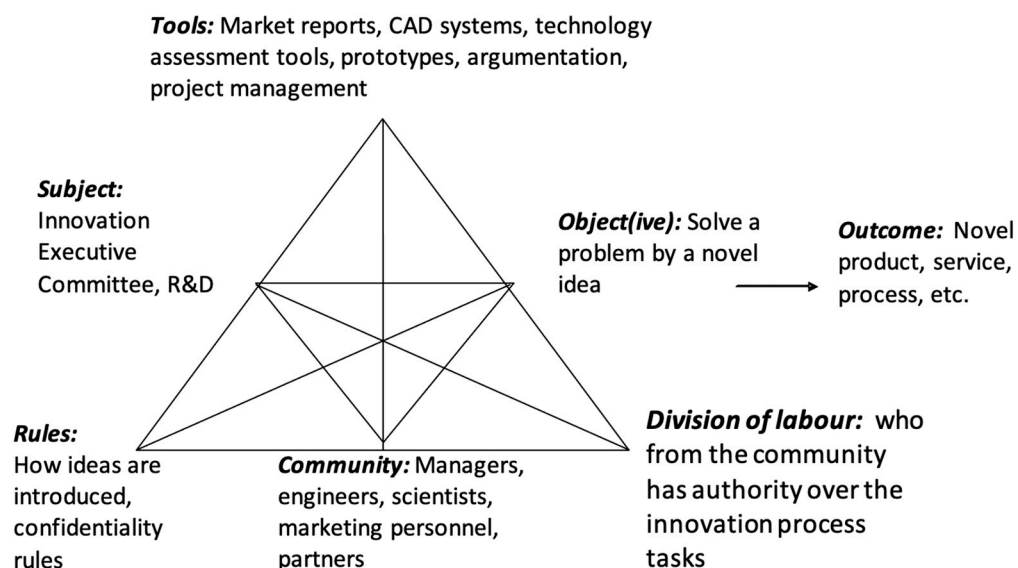


Figure 1. Activity-theoretic representation of (closed) innovation (Source: [16]).

The activity theoretic representation of argumentation and its context includes all the elements of the context-embedded argumentation model of [38], 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. In addition, the object of the activity corresponds to 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 associated to the outcome that denotes its effectiveness.

An activity representation of the entire innovation process would include, for instance, the Innovation Executives Council, or the R&D department, as subject and the specific innovation issue/problem as the objective (Figure 1). 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 organization's dominant argumentation scheme (e.g., based on expert opinion) and other tools, such as Powerpoint slides, documents, prototypes, etc., influenced by the division of labor (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 (organization) rules (e.g., proposals should be in written form, confidentiality should be guaranteed). The product of the innovation process (technology, product, service, process, etc.) would be the outcome of the activity.

Activities are long term phenomena with no clear-cut beginning and end. They produce (lower-level) activities and are realized by means of actions. On the other hand, they are emergent phenomena, not reducible to actions and operations [56]. Contradictions are historically accumulating structural tensions, developing while activity is being carried out, principally originating from interaction with, and influenced by, 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.

Activity Based Analysis (ABA) [57] is a socio-technical systems analysis method for organizational change, in which the activity construct (triangle) is applied at different levels of system detail to explain change by identifying contradictions, or for initiating remediating actions to facilitate change [58]. The principal unit and departing point of analysis is a single activity corresponding to the emerging behavior of the organizational unit/function, or process, under consideration [56,57], e.g., the activity of argumentation in the innovation process exercised by those involved in the process. Then, for explaining

change, the analysis proceeds by considering the historical development of activity and questioning whether contradictions are 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. If the sources of change are internal, the process continues by considering activities of specific actors, or lower-level actions and operations (which are more reflexive in nature) performed to achieve the overall objective. The contradictions developed are identified, and the mitigating actions are investigated, in relation to the subjects engaged. 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 focal 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 for the linked activities by investigating whether these changes were the result of internal developments or were caused by another activity. Then, the process continues as above.

Obviously, the above process is more suitable for analyzing organizational change and information systems strategy retrospectively. However, activity theory can also be used when an organization 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 being planned to improve operations. The activity model (triangle) is used as boundary object in a multi-participant workshop setting [59]. The basic procedure of Activity Based Analysis [57] can be essentially employed as depicted above. ABA can also be used in the context of the Change Laboratory method [60,61], beginning 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, then proposing new forms of activity, and finally, testing them. When the analysis concerns planned change, changes are mapped into activity models of the existing practices, possible contradictions are identified, changes are proposed and discussed, before being agreed to be implemented. Change Laboratory is a synchronous participative method whose primary objective is learning from the process *per se*. ABA, on the other hand, has a more teleological character, i.e., aims at results, and parts of it can be accomplished off-line as desk study.

In performing these methods, the argumentation activity can be considered as a lower-level activity within the innovation activity (or it can be part of another organizational activity, such as strategy making, or part of a specific innovation phase, e.g., commercialization and value appropriation) (Figure 2). An individual, or a collective entity representative, that constitutes the subject of the activity is engaged in 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 a specific argumentation scheme/logic—for instance, expert opinion—to transform the object. This is the instrument/tool of the activity and mediates the relationship between the subject and her persuasion objective. The context of the argumentation activity includes the formal and informal rules of argumentation, i.e., how arguments are placed, evaluated and selected (the rules of the activity). It also includes the community of all interested parts (principally the audience of the arguing subject), and the division of labor that determines who has the right to place arguments, who to support arguments, etc. Tying the argumentation activity to its innovation context, facilitates the detection of unwanted behaviors, such as knowledge hiding [39], as they appear as contradictions between the elements of the activity.

The choice of activity models to act as boundary objects instead of other practice-based and/or network models, such as actor-network theory (ANT) is attributed to its multi-level ontology (distinction of structure and agency), its more humanistic nature (priority of human over non-human agency and focus on intentionality and competence of human individuals over the heterogeneous network) [59,62] and the practice-based socially-constructed-knowledge epistemology of activity theory that is consistent with

action research [56]. Nevertheless, the compound use of AT and ANT may facilitate the management of model complexity by allowing the move between different levels of detail in the inquiry (zooming-in/zooming-out) [46,49].

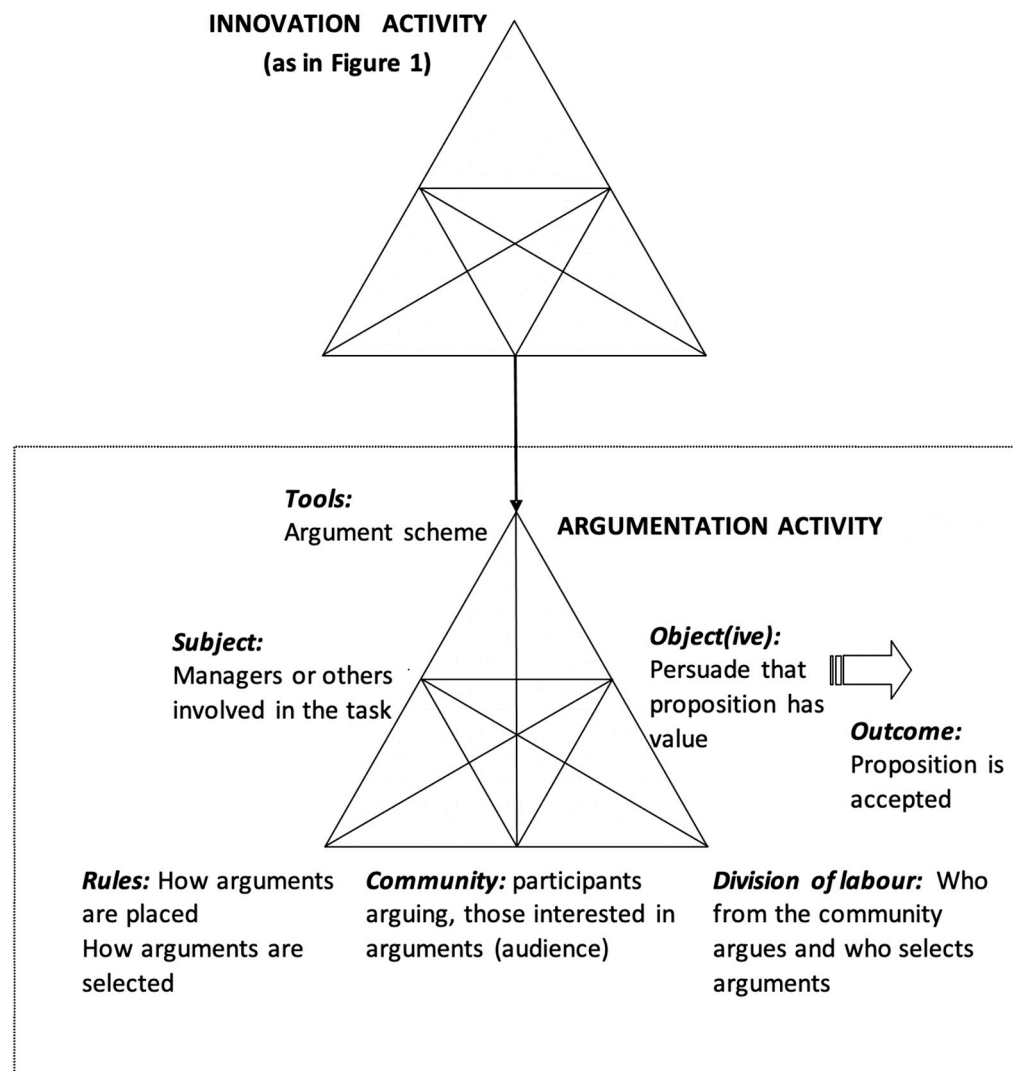


Figure 2. Argumentation activity as part of the innovation activity.

Open innovation can be better understood as a pair of interacting activities (Figure 3). Interaction can be studied at different levels, but the most appropriate level for our case is that of argumentation as knowledge (co)creation. Both activities share and/or co-construct the common object, which is to provide persuading arguments for their cases/proposals regarding designs, technologies, etc., and objectify them as usable knowledge. As the upper part of Figure 3 indicates, in the knowledge co-construction model of OI, which includes the models of innovation markets, communities, contests and toolkits, there is a direct interaction between activities as they share the same motive, in the same period of time. This is not the case for the user-led innovation model where the two activities are being carried out asynchronously, without any obvious motive to interact. Under specific circumstances, interaction may take place and the focal company may co-construct the object of innovation activity with users, whose knowledge production/innovation activity may belong to the epistemic periphery of the company, e.g., may be organizational innovation related to maintenance of production machinery. In both cases, the interaction of activities through a common object induces contradictions and changes in the innovation context (linked activities) of both parties. Resolving these contradictions leads to changes in

the way innovations come about, and the way they are argued for, i.e., changes in the related argumentation schemes. In addition, it may reveal inconsistencies due to distorted objects caused by the willingness of one or more of the parties involved to hide knowledge [39].

As the case in the next section shows, the analysis may reveal that, according to the specific OI model adopted, and the particular organization and industry context, activities have different argument schemes as tools/instruments. Accordingly, the IS platform being developed to support OI has to be modified so that it implements the appropriate model for the context of the particular organization.

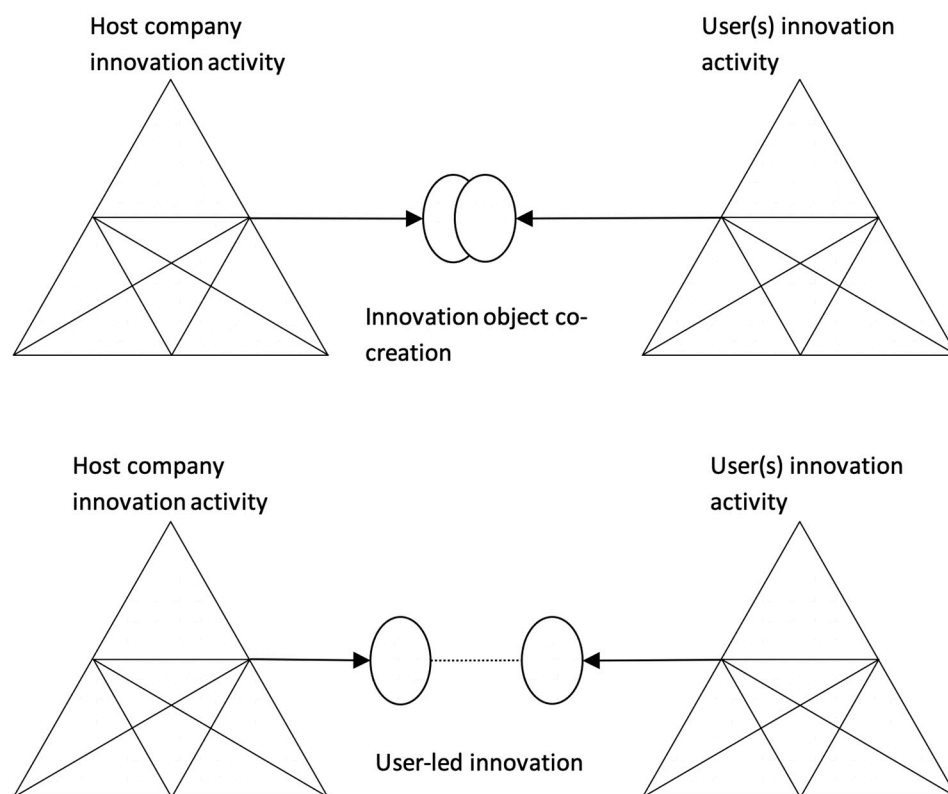


Figure 3. Activities in OI model of co-creation (upper part) and user-led innovation (lower part).

5. A Case Study of Aligning Open Innovation and Argumentation Scheme in a Mixed Product-Service Business Model

5.1. General

The case concerns the adoption of open innovation through the introduction of an ICT platform in COFFEE ISLAND S.A., a company operating in the food and beverages sector in Greece. COFFEE ISLAND has a mixed product-service business model. It produces the ingredients used in an array of products (coffee mixes, chocolate, etc.) that sells in raw and packaged forms for domestic use and serves them in the coffee shops of its network. As it was already indicated, customers buy either products or services, or both, however in different transaction (there is no combined value in either). The reason for the development of the case was to report action research carried out using activity theory as a boundary object for gaining understanding about the relationship between the context of the innovation processes and the (dominant) argumentation schemes implemented in an open innovation software platform to be adopted by the company.

5.2. Methods

The case is the result of an action research project in which both company executives and academics, informally assuming the role of consultants, were involved. Action research has been advocated for some time as an appropriate means of carrying out research in Information Systems [63]. Action research (AR) is a collaborative process between researchers and people in the situation (those “researched”) that differs from the testing of hypotheses [64]. Themes replace hypotheses, and research aims at practical achievements in the problem situation (e.g., to contribute to the development of an information system), as well as at acquiring knowledge concerning the process of problem solving. The a priori choice of a methodology for the inquiry and the communication of this choice facilitate the understanding of the specific research process and the dissemination and validity of the knowledge obtained [64].

The action research approach of Checkland and Holwell [65], based on the FMA framework (Framework of ideas, Methodology, Area of concern), was used. The area of concern was to understand the organizational changes regarding dominant argumentation schemes that the introduction of an ICT-mediated OI process would induce, and configure the corresponding IS platform accordingly. The methodology used was based on Activity Based Analysis and Change Laboratory, whereas the framework of ideas, in addition to activity theory and its application in organizational change came from the theory and practice of open innovation, argumentation theory and Information Systems, as depicted in the preceding sections. The challenge was to yield knowledge about argumentation and open innovation models (F), as well as about the application of ABA in such IS development situations (M) in interaction with the area of application (A).

The action research followed the generic procedure suggested by Checkland and as depicted in [64], i.e., 1. Enter the problem (A); 2. Establish Roles; 3. Declare M, F; 4. Take part in change/design process (Rethink 2,3,4); 5. Exit; 6. Reflect and record learning in relation to F,M,A. The methodology (ABA) was carried out in accordance with the guidelines for the recursive process of Change Laboratory [60] and Activity Based Analysis [57] (Figure 4). Following six structured discussion sessions, activity diagrams were developed off-line. Data from a questionnaire survey involving outlet managers and franchisees was also used. In the meetings, notes were taken and used in the analysis of the activities. The mapping of the current situation of closed innovation system of activities was based on information provided by the company executives. The corresponding mapping for open innovation took into consideration the design features and use scenarios of an innovative OI platform under development. The scenarios were developed cooperatively between researchers and those in the situation (company executives). In a second round, the intended platform functionalities were presented to, and discussed with, company executives and technical consultants. In a second stage, interviews with outlet managers and franchisees regarding their contribution to the innovation process were also considered, together with the results of a related questionnaire survey. The interventions which are depicted below were proposed by the company executives. After reflecting about the process, the writing up of the case followed. A summary is depicted below.

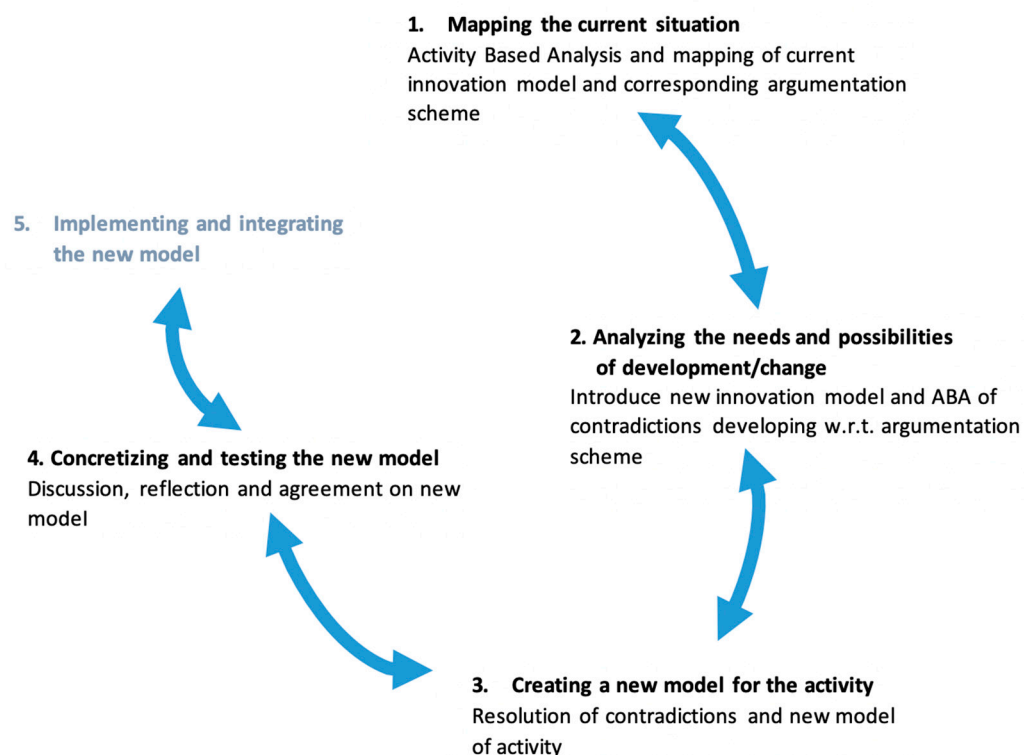


Figure 4. The methodology used in the case study.

5.3. Description of the Case

COFFEE ISLAND is the leader domestic coffee roaster in Greece, as well as the owner and franchisor of brand corner coffee shops, operating more than 400 shops/outlets in Greece and abroad. The company is as a multi-shareholder private company with a formal “R&D and Innovation” department, which in its planned operations and innovation initiatives cooperates in an ad hoc manner with shop managers and suppliers (in a variety of product and service aspects). So far, the output of this unit mainly concerned products (flavors and mixes), outlet layout and operations, maintenance of equipment, etc.

At the time of the study, the company intended to switch to the open innovation model through the introduction of an ICT platform that would support the entire innovation process. In its existing mode of operations, all ideas and proposals were filtered by the management of the company in a top-down fashion, without having much interaction between proponents and management. Very limited feedback was provided and only brief discussion of ideas took place. Therefore, in actual fact, very limited diverse external knowledge was being used. For the management of COFFEE ISLAND, this was the main motivation for embracing the ICT-mediated open innovation model that would allow the engagement of, and support the productive cooperation with, internal and external stakeholders in the innovation process.

As far as argumentation in innovation is concerned, the existing dominant scheme was close to the forms of causal association and analogy. The argument for accepting a novel proposal, idea, etc. was that “it is in accordance with the values, the vision and the strategy of the company, as they are written in the documents and expressed in the discourse of the company”. This scheme can be considered as causal association because ideas/claims associated with the above triptych (values, vision and strategy) were supported by emphasizing causal relationships with other innovative ideas that proved to be effective for the company. It was also close to the scheme of analogy, because frequent references were made to resembling cases of products, processes, etc. that were 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 success of the company).

An important incoming stream of innovation that came into notice during the transition to OI was innovation in service provision. The main actors involved in this activity were franchisees or outlet managers and employees, who had already participated in innovation sessions, however in a somehow passive role. The reason was that their ideas, or even innovations implemented, came from the actual practices of service provision and were not formally recorded and communicated. Nevertheless, lately it became apparent that the provision of service is an activity transparent to end customers, who can supply their input in improving services through innovation. On the other hand, franchisees, shop managers and employees innovate through improvisations for making their work easier and their customers happier. Field research used in the Change Laboratory sessions revealed that when trying to “sell” their innovation to the franchisor, their arguments were mainly based on analogy—if it works in our shop, it will work in any shop. Obviously, this was a user-led innovation and since the appropriate processes and infrastructure did not formally exist, many innovations, if not unnoticed, were unexploited, as far as their diffusion to the network was concerned.

In the move to a more open innovation model for products and services, COFFEE ISLAND intended to adopt a mixed innovation contest/crowdsourcing and innovation community model that would take advantage of the company’s presence in the social media. The crowdsourcing model would engage end customers, whereas the innovation community would be addressed to business partners, such as suppliers, franchisees, advertising agencies, consultants, etc. In the course of action research, Activity Based Analysis was used to identify the possible contradictions that would arise between the new innovation context in which argumentation will be exercised and the characteristics of the existing argumentation scheme. As it became apparent, in the above models, the critical mass of participants of the innovation process would be widened. So, contradictions between the argumentation schemes (tools in activity model) and community in the argumentation activity are more likely to emerge and propagate into the higher-level innovation activity. Consequently, an argumentation scheme consistent with increased participation and direct interaction that would resolve the contradiction thought to be more appropriate. In this line, an argumentation scheme based on popular opinion thought to be suitable to become the core of COFFEE ISLAND’s open innovation process argumentation scheme implemented in the ICT platform.

Figure 5 below presents the outcome of Activity Based Analysis in the focal argumentation activity which is part of the overall innovation activity. The activity depicts both the old mode of innovation of the company, as well as its new one. The elements of activities with “deleted” descriptions denote the elements before changes to resolve contradictions arisen after the adoption of the new mode of innovation were made. The secondary contradictions (dotted lines in the activity triangle) between the subject(s) and the rules (many participants in workshops need to place arguments in a sort of synchronous manner), between the subject(s) and the division of labor (more partners need to have the power to place and support arguments), between the subject and the tools (the argumentation of a wider multitude should be supported and taken into consideration in a different way), and between the community and the tools (difficult to apply analogy and causal association schemes to a large number of claims) were identified and discussed before their resolution. In effect, the four contradictions could be remediated by institutionalizing a different argumentation scheme based on popular opinion. This can be implemented in many different ways with the help of the ICT platform. In addition to objectifying the rhetoric of argumentation, by assigning different weights to different organization positions and roles, a power/priority structure with respect to argumentation can be inscribed into the discourse supported.

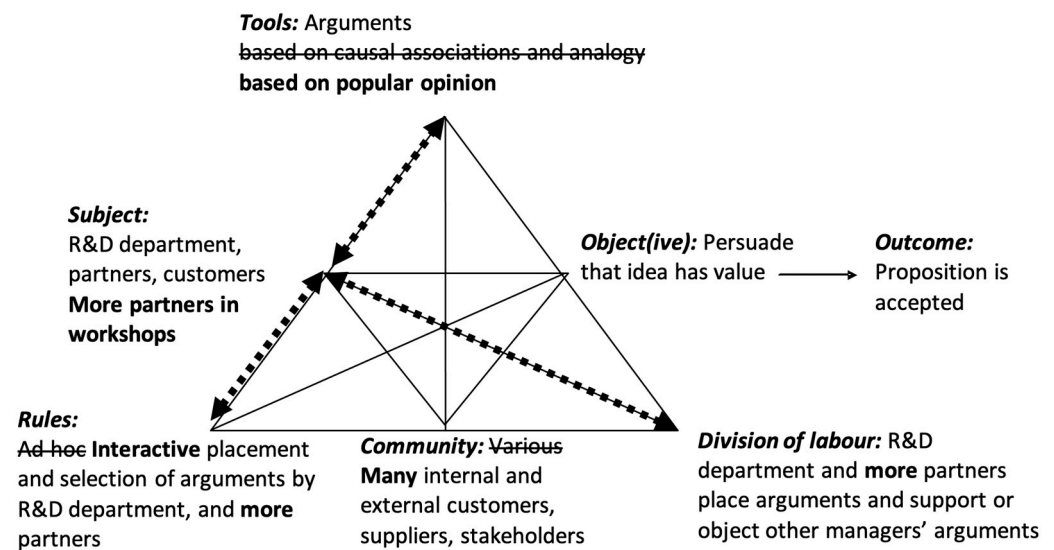


Figure 5. Argumentation in innovation process before and after the adoption of OI model (Source: [16]).

User-led innovation by intermediaries in COFFEE ISLAND's shops as discussed above was considered separately and appropriate activity models were developed (Figure 6). As these innovations involve a small number of participants, and each innovation has its peculiarities, specific cases have to be considered individually and discussed in a community of experts. So, for this innovation stream, the company's existing innovation model and its activity representation was thought appropriate, however assuming a web-based implementation. Considering the asynchronous nature of this model, it was decided that the IS should facilitate the scalable, ad hoc recording of innovative ideas in rich formats with signs/keywords for easier identification. It was also decided that it should guide innovators to search information for forming a sound basis for their ideas and innovations, i.e., to argue as experts. This will improve the process of co-creation of new knowledge when interaction with organization core members takes place.

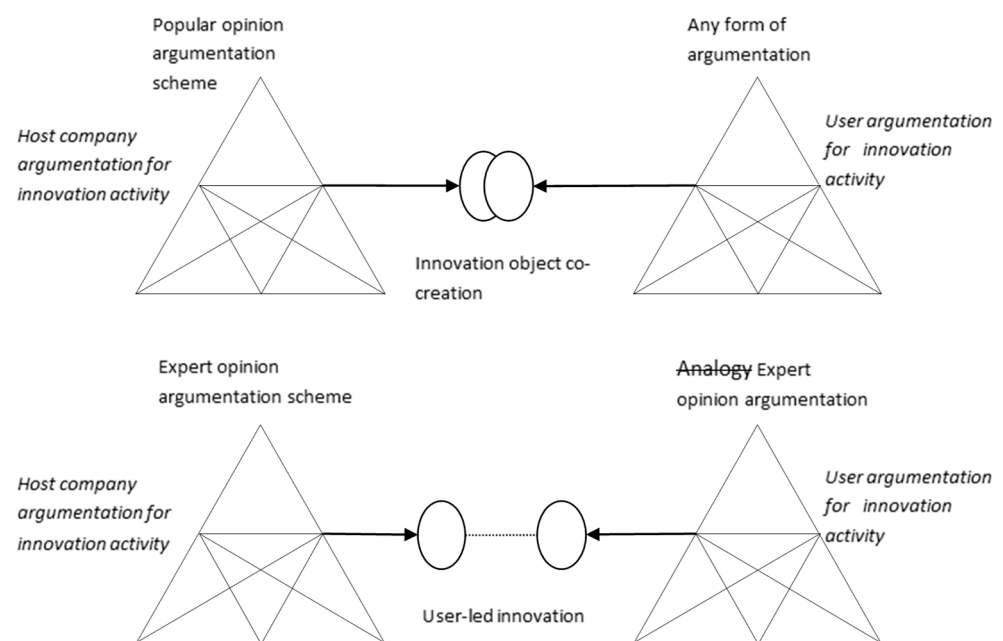


Figure 6. Argumentation activities and schemes in co-creation and user-led innovation.

Overall, the employment of activity theory in an action research setting proved helpful for deciding and implementing the appropriate argumentation scheme for the open innovation model adopted by the case company. The identification and resolution of activity contradictions led to the necessary organizational changes and ICT functionalities required for this alignment.

6. Concluding Remarks

In this paper, adopting a socio-technical systems perspective through activity theory, we discussed the alignment of OI model adopted by a company with the knowledge-producing dominant argumentation scheme, which is part of the organization's culture in general, and innovation process in particular. We maintained that this alignment should be considered when developing information systems for implementing OI, especially in organizations that have mixed product-service business models and different argumentation schemes. In such models, intermediaries between the main company actors and customers are also a source of innovation which frequently remains unnoticed.

Through action research, we showed how activity theory and its analysis instrument, the activity system, can be employed for the assessment of the alignment of innovation argumentation scheme with its employment context (innovation model), and how it can highlight the differences between argumentation-driven knowledge co-creation with customers and business partners, and argumentation-based exploitation of user-led innovation involving actors in the periphery of the organization. Understanding these differences is of particular importance when a company moves from company-centered (closed) innovation to a technology-mediated open innovation model. Identifying contradictions between argumentation schemes and their contexts (OI model (to be) adopted and implemented) in a participative research effort is a valuable learning exercise of particular importance for innovation effectiveness.

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