Artículos
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Virtual Communities and Offline Collaboration: Four Case Studies

Comunidades virtuales y colaboración offline: cuatro casos de estudio

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Abstract

In this article we focus on the relationship between online communities, so-called virtual communities (VCs), and offline collaboration in order to gain insight in (1) the relationship between VCs and collaboration and (2) the relationship between the perception of the virtual/virtuality and collaboration. Based on 49 in-depth interviews with members of a social VC (*GSCAI*), a professional VC (*Diarioclown*), a non-profit VC (*AZALEA*) and a commercial VC (*Fe&G*) we conclude that VCs can be a cheap and powerful tool to support offline collaboration. However, this efficacy can also *destroy* or compromise a group. From a theoretical perspective, our study demonstrates the applicability and usefulness of Porter's typology of virtual communities and suggests extending it with an online-offline orientation or dimension.

Resumen

En este artículo nos centramos en la relación entre las comunidades *online*, las denominadas comunidades virtuales (VC) y la colaboración *offline* con el fin de obtener información sobre (1) la relación entre las VC y la colaboración y (2) la relación entre la percepción de virtual / virtualidad y la colaboración. Con base en 49 entrevistas en profundidad con miembros de una VC social (*GSCAI*), una VC profesional (*Diarioclown*), una VC sin ánimo de lucro (*AZALEA*) y una VC comercial (*Fe&G*) concluimos que las VC pueden ser una herramienta barata y poderosa para administrar la colaboración *offline*. Sin embargo, esta eficacia también puede *destruir* o comprometer un grupo. Desde una perspectiva teórica, nuestro estudio demuestra la aplicabilidad y la utilidad de la tipología de Porter de las comunidades virtuales y sugiere su expansión con una orientación o dimensión *online-offline*.

Introduction

In this article the authors focus on the role of VCs in supporting collaboration. First, a description of the four VCs that were selected as research subjects is presented. Next, the concepts 'virtual community' and 'collaboration' are theoretically unpacked. In the subsequent section of the article the methodology is described. The article ends with a presentation of the research results followed by a short discussion and conclusion.

Virtual Communities

In order to understand the concept *virtual community* (VC) both its elements must be taken into account: *virtual* and *community*. The *virtual* can be conceptualized as something which exists without being there, therefore, without space-time coordinates (Van Dijk, 1999, p. 250), even if in this field of study the term *online* can be considered as synonymous (Matzat, 2004, p. 66). Contemporary sociologists represent *community* as a symbolic construction (Cohen, 1985, p. 97), a pseudo-community (Beniger, 1987, p. 353), or an imagined community (Anderson, 1983, p. 6). Community can be seen in different ways depending on the representation chosen; when people learn within a community it can be labeled as community of practice (CoP) (Wenger, 1999, p. 96) that can be represented as a social *container* of competences which constitutes the basic building block of a social learning system (Wenger, 2000, p. 229); when people stay together for a common goal they can be considered a community of interest (CoI).

Many scholars refer to Rheingold's definition of a virtual community as a social aggregation that emerges online when enough people carry on public discussions and with enough human feeling (Rheingold, 1993, p. 5), nevertheless there is no consensus on a common definition (Preece & de Souza, 2004, pp.579-580). The following five attributes of virtual communities are mentioned in the literature:

- *Purpose* (content of interaction, the specific focus of discourse);
- *place* (extent of technology mediation of interaction, so where interaction occurs either completely virtually or only partially virtually);
- *platform* (design of interaction, it can be synchronous or asynchronous communication, as well as both);
- *population* (pattern of interaction, group structure and type of social ties);

- *profit model* (return on interaction, this refers to whether a community creates tangible economic value) (Porter, 2004).

The selected cases can be considered as VCs because they incorporate these five attributes and, regarding to the attribute *place*, the minimum set of conditions required to label a cyber-place with associated group-CMC (Computer-Mediated Communication) as a virtual settlement is satisfied (Jones, 1997).
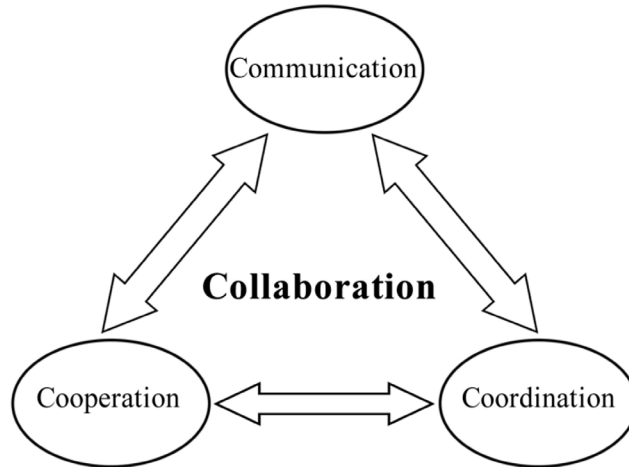
Collaboration

Collaboration and cooperation have often been used loosely (Hammond, 2017, p. 1006), but the authors make a conceptual distinction between communication, coordination and cooperation activities, considering these three different interaction modes as separate but interdependent processes that rely upon each other (e.g. Thalheim, Jaakkola, Nakanishi, Sasaki & Schewe, 2014, p. 301; Sauter, Morger, Mühlherr, Hutchison & Teufel, 1995, p. 120):

- Communication: describes the process of (mediated) interpersonal information exchange;
- coordination: refers to agreeing on and aligning group activities (Riemer, 2007, p. 349);
- cooperation: the production which takes place on a shared space (Thalheim et al., 2014, p. 293; Fuks, Raposo, Gerosa, Pimentel & Lucena, 2008, p. 637) with the group (Denise, 1999).

Collaboration can be represented as a 'triangle' (Figure 1) where communication, coordination and cooperation are related to each other (Thalheim et al., 2014, p. 302): without communication, coordination is not possible, and without coordination (of people, resources...) collaboration is not possible either. Of course, in real life these process categories are not that clearly delimited: for example, communication tools are also often used to coordinate actions or to collaborate on a specific task. Ellis, Gibbs & Rein proposed this model (1991) with slightly different terminology (Fuks et al., 2008, p. 148).

In order to frame collaboration further it is important to underline that it occurs "(...) when a group of autonomous stakeholders of a problem (...) engages in an interactive process (...)" (Wood & Gray; 1991, p. 146). Also, collaboration can occur by mail, over phone lines, and in person (Schrage, 1990, pp. 40-41).

Figure 1. The collaboration triangle

Source: adapted from Thalheim et al., 2014, p. 302 and Fuks et al., 2008, p. 148.

Focusing on the online asynchronous discussion (OAD), Murphy elaborated a collaboration model represented by a continuum of six processes (Murphy, 2004, pp. 422-423). First, participants present themselves to others (*social presence*). Next, they externalize their point of view (*articulating individual perspectives*) and potentially restructure their ideas (*accommodating or reflecting the perspectives and meanings*). They can also share meanings (*co-constructing shared perspectives and meanings*) and goals (*building shared goals and purposes*) until they realize a shared artifact (*producing shared artifacts*). In this model, also inspired by Schrage (1995, p. 29), the stages move: "(...) from interaction to collaboration" (Murphy, 2004, p. 424) and the lower levels are prerequisites for the highest ones. Of course, interaction does not guarantee collaboration. The work of Murphy (2004) and Thalheim et al. (2014) can be put together and summarized by describing collaboration as a joint work where there is a: "(...) process of shared creation (...) (which) creates a shared meaning about a process, a product, or an event" (Schrage, 1990, p. 140), between two or more persons, in a shared space (Schrage, 1990, pp. 31-32; Thalheim et al. (2014, p. 293), —which is suitable to the online environment— where persons are aware of goals and means deployed (Zackland, 2003, p. 191). Murphy bases his model on elements like *meaning* and *purposive relationship* derived by Schrage (1995, p. 29), while Thalheim et al. emphasize the notion of *shared space* (Schrage, 1990, p. 98).

Methodology

In order to understand how collaboration works in VCs, using a qualitative approach, researchers asked respondents to describe how they communicate, how they manage their activities and how they cooperate in order to collaborate within the VC. Interviews were needed to fully reply to these research questions because netnography alone is not able to give those answer: "...observational data of the collaborative dynamics on the community level would have to be confronted with in-depth interviews with individual community members to uncover divergent interpretations of identical instances" (Grabner & Ibner 2017, p. 552). From February 22nd, 2012 to June 16th, 2013 49 in-depth interviews were conducted (average length of 90 minutes). For the analysis of the interviews a deductive coding methodology was used, which encompasses three coding phases (Miles & Huberman, 1994, pp. 55-68). In the first phase descriptive codes were assigned to text snippets based on predefined areas of interest, whether factual, thematic or theoretical in nature (Lewins & Silver, 2007, p. 86). Using literature on Network Society (Castells, 1996, pp. 500-509) and Networked Individualism (Rainie & Wellman, 2012, pp. 3-20) as the theoretical background, the researchers focused on dimensions of collaboration (Thalheim et al., 2014, p. 293) to assign codes describing the website usage and the kind of collaboration experienced by the VCs' members. The authors also coded the type of respondents in order to understand whether the duration of membership to the VC played a role. Next, interpretative coding took place, digging deeper into the meaning of the descriptive codes. Using an exploratory-descriptive logic moving towards an analytical generalization (Yin, 2003, pp. 30-31), at the end parallels, differences and oppositions between the descriptive and interpretative codes were examined, pattern codes were assigned. At the end thematic analysis was done.

Case selection

Porter's typology of VCs is a classification system for multi-disciplinary research on VCs. It uses two categorization variables (establishment type and relationship orientation) and is applicable on an empirical level (Porter, 2004). As the first-level categorization element of the typology (member initiated versus organization sponsored VC) was hard to apply *on the field*, the second-level categorization (relationship orientation) drove the case selection.

Relationship orientation describes the main type of relationship fostered amongst the members of a VC. Based on this criterion a social, a professional, a non-profit and a commercial VC were selected from two different digital platforms; the *government* VC was not included because it was not widespread in Italy at that time (Figure 2), where the research was done.

Figure 2. Porter's typology of Virtual Communities
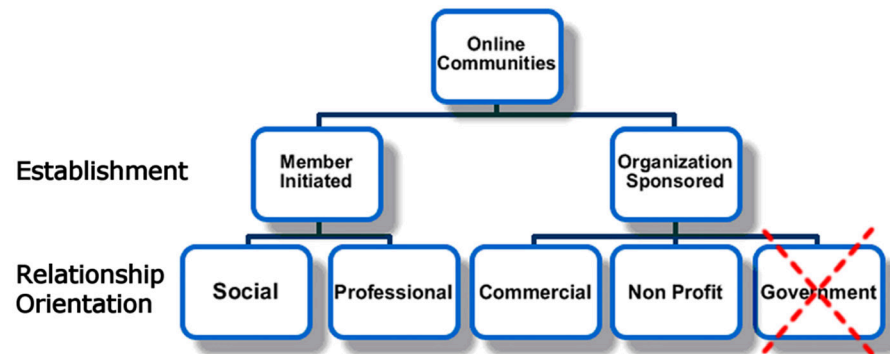
Source: adapted from Porter, 2004.

The *social* and *professional* VC are enabled by Yahoo! Groups, the *non-profit* and *commercial* VCs are supported by Facebook:

- *GSCAI* (Speleolgical Group placed at *Italian Alpine Club*) is a speleological group located in Rome and functions as the case study for a social VC. The group does activities (explorations, visits) which require planning (equipment, travel etc.). In order to manage this, they set up an online group called *GSCAI* on *Yahoo! Groups* where they make decisions and share reports about their speleological explorations, describing in detail what they did. Expert members who are *retired* from group activities exclusively keep in touch with other members via the VC. In January 2012 the group split up due to a different management of the online user accounts operated by the new steering committee.
- *Diarioclown* (it means *Diary Clown*, professional VC) is a group created by therapists located in Rome working as *clown therapists*. Members work as a duo at hospitals (usually one male and one female), and try to change the energy of the young patients (most often children) from fear and depression to a positive emotional state. In the online group, *Diarioclown*, they communicate only *professional* messages such as the weekly shift divisions and daily reports. Although new members from another job place joined the group, no real integration between both teams happened. This is probably why, because of different viewpoints and misunderstandings, in January 2012, just like *GSCAI*, this group also broke up and subsequently four members (from the 'new' team) decided to move to another job place.
- *AZALEA* (*Associazione Zampa Amica Liberi Ecologisti Animalisti - Free Ecologists Animal Right Activists Paw Friends Association*) is a non-profit association located in Rome that supports a cat center where they host,

feed and cure abandoned cats. They use various Social Network Sites (SNSs), but most of their activity is focused on a Facebook fan page, which is also used for *checking* the *adopted* cats (periodically asking adopters to share pictures of the adopted cats).

- *F&G* (the full name of the group is *F&G Salsa School*, in which *F* and *G* are the initials of the instructors) is a Caribbean dance school placed in Rome. *F&G* also organizes events not always related to dancing and music providing opportunities for social interactions to its members on a regular basis. *F&G* has a Facebook fan page to spread news about its activities (e.g. changes in lesson schedules, special events...).

The main features of the four VCs that were studied are summarized in Table 1.

Table 1. Virtual Communities investigated

	GSCAI social	**Diarioclown** professional	**AZALEA** non-profit	**F&G** commercial
Established	over 4 years	over 4 years	4 years	over 4 years
Platform	Yahoo!Groups	Yahoo!Groups	Facebook	Facebook
Open/close	close	close	open	open
Members	49	11	> 2000	> 600

Source: Table produced by this research.

Results

GSCAI respondents clearly expressed that the VC had a strong positive effect on the common activities of the group. Online reports and coordination messages show the group to be *alive* to its members and enhance the *attraction* of the members to the group and its activities. Communication was described by a respondent as follows: "It is useful to know the information passed through the mailing-list because everyone is informed about the situation, so, in order to be ready for the next activities..." (female, beginner, 33 years old). Coordination happens during weekly face-to-face meeting, but typically just few members can join them because of logistic problems and lack of time. Consequently, the VC makes this possible by letting them assign tasks, communicate meeting points, timetables etc... "(...) this makes our activities easier..." (male, beginner, 47 years old). This is essential for their team work, which is necessary because the common equipment is heavy, so, it is not possible to make an exploration doing the maintenance alone. Then the cooperation can take place and starts before the beginning

of the outdoor activities: within the VC they share information regarding the place to visit, the technique and equipment to use as well as the strategy that must be implemented and which is shared and decided online. In this process so called *sleepers*, expert users that no longer join group activities, give members additional information:

> ...yes, it was useful because you could collaborate there [in the VC] because... even if they don't join the weekly meetings and the outdoor activities anymore, they are still subscribed to the mailing-list, so sometimes we asked them: "Listen ... you were there many years ago, do you remember that part of the cave? How is it possible to overcome that point? (Male, average, 27 years old).

Consequently, the VC has a positive impact on the online and offline activities. In *GSCAI* the VC effectively supports many aspects of the group's activities, but it also instigated confrontations. The influence of the VC is so effective in *GSCAI* that when the accounts of the so called *sleepers* were cancelled the online *confrontation* immediately started. Mainly readers, sleepers just gave suggestions when requested. Their exclusion from the VC, after many years of absence from physical meetings and activities, instigated a sudden show of their attachment to the VC. With the management turnover the web policy was strictly applied. Consequently, the so called sleepers' user accounts (who rarely took part in the conversations and did not pay the annual fee) were erased.

Unpredictably these users took offence about this decision, so an online confrontation started between two main subgroups: on one side the members who agreed with the *new management* and on the other side the speleologists who supported the *sleepers*. Non-verbal, perceptual cues connote aspects of social structure to individuals: "Well, not having the person in front of you is the negative side of the VC, you have misunderstandings (...) If you want to have a complex conversation you just don't understand (...)" (male, average, 27 years old); this is even more challenging with group communication. The conflict probably arose because of a misunderstanding between the subgroups: the sleepers in reality did not *sleep* and, as a matter of fact, were also useful for the group activities; they cared a lot about being in the mailing-list even if mainly as *readers*, probably because they developed a Sense of Virtual Community (SOVC) (Blanchard & Markus, 2002, pp. 3567-3569) in addition to a Sense of Community (SOC) (McMillan & Chavis, 1986, p. 9). After the *incident* this subgroup did not try to communicate their needs to the management in order to find a solution and preferred to engage in a confrontation. A large majority of members said that the absence of non-verbal, perceptual cues played an important role in the conflict: "Actually, when you argue with a friend you try to meet him, I mean, you avoid talking on the phone because you know that on the phone you can't properly talk to

him (…)" (male, beginner, 37 years old). Furthermore respondents were less inhibited interacting online than face to face (Marinelli, 2004, p. 215) and this made the confrontation even harsher: "No one ever said those [bad] things to my face, because I'm a big guy and you know…" (male, expert, 55 years old). A symptom of the intensification of the confrontation was the amount of daily emails exchanged within the group, which consistently increased: *influence* is a bidirectional concept (McMillan & Chavis, 1986, p. 11) and the online sphere mediated spreading the discontent, from the individuals to the group or, also from the group to the individuals (on one direction (Zander & Cohen, 1955, p. 491) or both (Thrasher, 1954, pp. 237-238).

In *Diarioclown* reports are a very important source of information for team members (e.g. on specific situations at various medical departments), because they inform on what happened with certain patients. In this VC communication is done by sharing important information gathered by nurses. Also weekly shift divisions are given by the online (coordination), but cooperation is the preeminent dimension of this group and it takes place online through reports because they contain comments regarding the decisions taken by colleagues and describe how to work on a specific patient:

> (…) they are like "shortcuts" because… maybe they give you an access key in order to work on a patient and you don't need to put much effort entering the room [of the patient] because your colleagues had already worked on an input, you simply use the same input and then you know it works, and you can, you can work smoothly. So it's not only a duo work, it's really a team work. (male, expert, 31 years old)

In *Diarioclown* working with online reports was very useful for the members, in fact as research has shown: "Online, or virtual communities of practice are especially beneficial to medical practitioners who practice in environments with limited access to communication, limited opportunities for consultation" (Sims, 2018, p. 55). As a *professional* group, the content is formal and managed by an administrator (the manager of the group). Before the split into two subgroups, there was a conflict which did not emerge during the physical meetings. The VC was the only *place* where symptoms of this discontent were manifested. In fact the only element of this unease was the decision of not writing the reports thus refusing to support the group: "Look, this impatience was expressed on the VC by ceasing to write up reports. I mean, Diarioclown has faded at some point. So much that (…) we were only a few who continued to write (…)" (male, expert, 31 years old).

In *AZALEA* members receive useful information to support the non-profit association (fund-raising, cooperation…) and join the meetings; they also support each other together with the volunteers of the association: research

shows that Facebook can be an effective space for supportive interaction, enhancing users confidence in managing their own health and perceiving health-related social support (HRSS) from the SNS (Oh, Lauckner, Boehmer, Fewins-Bliss & Li, 2013, p. 2078), in fact sharing their own experience on an online group can provide them emotional support (Mo & Coulson, 2008, p. 374; Coulson, 2005, pp. 582-583), which is what respondents declared. Coordination is not very prominent in *AZALEA*, while Communication constitutes an important dimension of this VC because publishing pet adoption requests or useful information for pet owners are crucial for this association. Cooperation within the VC takes place in many different ways.

Firstly by fundraising or other forms of donation realized offline. *Secondly*, sometimes they cooperate using *ad hoc* group of volunteers set up for giving special support to pets in emergency situations. *Thirdly*, volunteers give suggestions and support to the pet owners: (…) I check the Facebook page everyday also for this reason, because if there is something I can do (…)" (female, beginner, 37 years old),

> (…) many ask for help: "Oh my God this happened, what can I do to remediate it?", so a mutual exchange of ideas and medical opinions, even without being a veterinary [laughing], so: "Oh God my cat had this intestinal problem, what can I do?". (…) and another one says: "Listen I had the same problem, give it this medicine and see if it works", so this is sharing experience and suggestions. (female, expert, 51 years old).

Lastly, by sharing the adoption requests on their Facebook pages, using their own social networks, users help the association to accomplish its mission. "(…) making advertising on our pages, we share the cat's page to promote its adoption, yes" (female, beginner, 52 years old); "(…) and we share the call for the adoption with our friends, and we ask them to share it with their friends so it can circulate by the web hoping it gets to the right person" (female, average, 45 years old). The large majority of *Fe7G* respondents consider communication as effective for information circulation of the dancing school activities, especially because of the relevant amount of customers and *stakeholders* (people that do not take the courses but join their events): "It is a virtual show-case (…) where you can read (…): 'the day *y* we have this activity. The day *z* we have this other one. The timetables are these ones. I remind you the courses start again…'" (male, beginner, 39 years old). Online *actions* of users, which can stimulate others to participate to the events, are described by some respondents as cooperation. Writing comments on posts can also elicit other comments from others, as well as publishing images or accepting the participation request to an event can tempt users to join: "(…) They are publishing some pictures from years ago

and it increases the desire to participate. Because they tempt you, don't they?" (female, average, 51 years old);

> (...) when I see nice comments I also write comments and I am also tempted to see other comments from other friends of the school [it means on Facebook] so that I participate by giving comments and participating to events or sharing my participation to the others so we are not one anymore but five, then ten, then twenty. (female, average, 42 years old)

Discussion and conclusion

AZALEA is mainly an online group but, at the same time, it appears to be cohesive and *consistent*. Through their experiments Eligio, Ainsworth & Crook (2012, p. 2051) found that understanding about each other's emotions has potential benefits for collaborators performance; moreover, this makes people collaborate more effectively, especially with remote collaborators (Eligio et al., 2012, p. 2052). Consequently, the *consistency* of *AZALEA* could be understood taking into account the sharing emotion information within it, which is one of its main characteristics. Social and professional VCs, the *Yahoo!* online groups, do not have frequent meetings, therefore they need the online space to *work* together.

In *GSCAI* online collaboration is relevant to the group activities regarding every dimension of the concept (Table 2), as well as in *Diarioclown* because working in a duo, changing partner and job place every day would be impossible without the VC (they meet at the headquarters once a month for a psychological supervision only). What changes between them is the *tone* of communication: in *GSCAI* users make jokes and have fun *between the lines*; on the contrary, in *Diarioclown* messages are always *professional* and work oriented. This aspect plays an important role. Firstly, because attitudes and perceptions about the climate of an organization can be influenced by the tone of its written communication (Kulhavy & Schwartz, 1981, pp. 22-23). Secondly, having too many or too long e-mails, or out of the context messages, would cause confusion and could decrease the efficacy of the team work because, as some clown therapists said, reading reports needs time and energy (it could summarize with their words: "it's a job in the job"), so: "... managers need to be mindful that users have a different propensity to contribute" (Chen, Wei and Zhu, 2017, p. 98).

The tone of communication and the amount of the email in *Diarioclown* is subject to restriction policies (Thalheim et al., 2014, p. 293). In the *Facebook* VCs, non-profit and commercial VC, the tone is not professional (it must be

taken into account that the instructors in *Fe&G* want to provide a cheerful and happy climate). Not only the tone of communication can be different between the cases selected. In *AZALEA* and *Fe&G* members look *dispersed* (because of the typology of these VCs and the amount of their users) and the online collaboration is different. In *AZALEA* users are *proactive*: pet owners keep each other informed with suggestions and moral support accomplishing the mission of the organization, moreover they support the organization with donations. On the contrary, the common activities in the commercial VC are planned by the instructors with the support of their assistants. Dance students collaborate online for the events organization, providing what is needed and motivating others to participate, but they look *passive* because they just give a hand in comparison with the other VCs' users. Therefore, members collaborate more actively in three out of four of the cases selected, because the dance students of the commercial VC are more driven by the company. However, generally there is a positive effect of VCs on collaboration in the four cases studied (Table 2).

More specifically the researchers observed that VCs:

- Support communication and coordination and this is crucial especially for those activities that require a high level of organization (*social* and *professional*);
- support cooperation in every VC investigated in different ways and play a role on the online and on the offline.

On the other hand this research also showed that VCs can:

- Increment the manifestation of discontent (*social* and *professional* VCs);
- increase quarrels because of the reduced non-verbal cues in computer-mediated communication (*social* VC).

Table 2.Collaboration in the four VCs

	GSCAI social	Diarioclown professional	AZALEA no-profit	F&G commercial
Communication	+	+	+	+
Coordination	+	+	±	–
Cooperation	+	+	+	+

Source: Table produced by this research.

On a theoretical level this study shows that Porter's typology can be expanded upon by adding the *main relationship orientation* within the VC (so, the online-offline orientation could be considered) (Agostini & Mechant, 2015, p. 22). Depending on the main domain of the group activities (online or offline), figures 3 and 4 show how the whole typology (Figure 3) or a part of it (Figure 4) could be adopted in that sense.

Figure 3. Possible first variation of Porter's typology
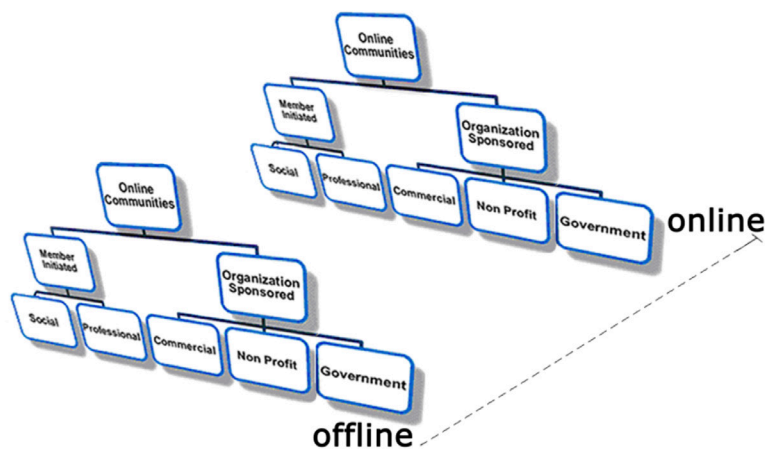
Source: Agostini & Mechant, 2015, p. 22.

Figure 4.Possible second variation of Porter's typology
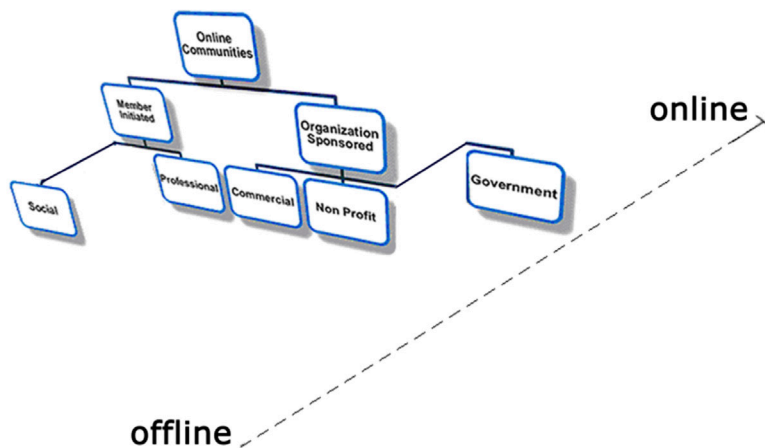
Source: Agostini & Mechant, 2015, p. 22.

On an empirical level this study shows how VCs are effective platforms for collaboration. In particular, SNSs create more opportunities to exchange information (Steinfield, Ellison & Lampe, 2008, p. 443), generally because online environments are *dynamic* or *fluid* spaces (Faraj, Jarvenpaa & Majchrzak, 2011, pp. 1234-1236). This characteristic can help to explain the capacity of VCs to enhance collaboration as well as to create tensions (Faraj et al., 2011, p. 1226). Also trust plays an important role in VCs (Wu, Chen & Chung, 2010, p. 1032) and in the cases selected it is supported by the association or the company which is the foundation of the VC: "Well, I have always considered the Yahoo speleological group and the speleological group itself as the same thing, because people are the same (...). So for me it's the same" (*GSCAI*, male, average, 27 years old); "(...) this is a job at the end, it would be utopian to think everything is always fine (...). But this is also a second family for me, you know?" (*Diarioclown*, male, expert, 52 years old); "Consequently, we became a big family, you know?" (*Fe&G*, female, average, 51 years old).

> I'm not into talking in the group or about my stuff, I am online just to be able to say: "Look at my cat, I took it from this association which is very serious. So if you want to adopt a cat this is a serious association composed by serious volunteers". (*AZALEA*, female, expert, 28 years old)

Results from the interviews, observation and netnography are presented in the summary Table 3 based on the Murphy's collaboration model (2004, p. 424); it shows high levels of collaboration in all the selected cases. In *Fe&G* purposes and goals can be different (users are *clients* after all, even if in this case the instructors try to build up a sort of *big family*). In *Diarioclown* the number of messages exchanged is kept low in order to make the reading process not too heavy, and this puts a limit over the last dimension on the online space: collaboration here mostly takes place offline.

In two cases discontent was manifested and in the VC *GSCAI* this evolved into confrontations. Several different factors can play a role in collaboration (Weinel, Bannert, Zumbach, Hoppe & Malzahn, 2011, p. 513) and participation in online communities can be explained as driven by needs or desires (Bishop, 2007, p. 1890). Social media can be beneficial for collaboration, as well as dangerous or undesireworthy for the organization/company which hosts the VC. Social media monitoring can be useful in order to prevent possible *side effects*, nevertheless this is not always possible (Piller, Vossen & Ihl, 2012, p. 9), and it is also complicated because conflict management not only depends on the origin of conflict, but is also influenced by characteristics of individual participants as well as community factors (Hauser, Hautz, Hutter & Füller, 2017, p. 305).

Table 3. Collaboration in the four VCs

	GSCAI social	Diarioclown professional	AZALEA no-profit	F&G commercial
Social presence	+	+	+	+
Articulating individual perspectives	+	+	+	+
Accommodating or reflecting the perspectives of others	+	+	+	+
Co-constructing shared perspectives and meanings	+	+	+	+
Building shared goals and purposes	+	+	+	±
Producing shared artifacts	+	±	+	+

Source: table produced by this research.

Interestingly users are mostly unaware of the essential role played by the VC.

In conclusion, what happened offline had consequences online, and vice versa even if respondents are not very aware of virtuality. This entails that the online-offline orientation of VCs should be taken into account when creating typologies of, or conducting research into, VCs. As shown in previous research, virtual interaction is effective and should not be considered as a deficient substitute for face-to-face interaction, as well as collaboration on VCs as immaterial (Grabher & Ibert, 2017, p. 552). This supports theories developed by Wellman (Rainie & Wellman, 2012, pp. 3-108), and other scholars (Comunello, 2010, pp. 157-177; Marinelli, 2004, pp. 199-246), stating that a VC helps to support the *virtualization* of social ties (Comunello, 2010, pp. 114-115).

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