

Exploring Collective Action Dynamics in Online Communities from a Critical Realist Perspective

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1 Introduction and Motivation

Online Communities (OCs) are persistent collections of people that share common or complementary interests, mainly communicating through the Internet [1] citing [2]. Scholars have investigated several aspects within the setting of OCs, such as their potential to sustain shared knowledge production processes [3–8], the individual motivation to participate (and factors influencing on motivation) [1, 9–11] and governance mechanisms supporting the coordination of the people and resources composing the OC [12–15].

The three main components of OCs (people, technologies, and organizational structures) influence each other, but are frequently discussed separately in the literature. We posit that they should be studied together, to generate new knowledge and to challenge current, sometimes unfit, understanding of the organization side of OCs [15]. In this paper we therefore aim at answering the following research question: *which mechanisms sustain the collective action dynamics of OCs?*

We conducted a study of the OC management and use by an Italian political movement, the Five Star Movement (Movimento 5 Stelle, M5S). M5S represents a pertinent research unit for online communities from two perspectives: (i) its size, influence and technological configuration for the political context, and (ii) its diversity from the software development and knowledge sharing communities that are the prevailing target in literature on OCs.

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By assuming the ontological inseparability of the three components of OCs, we conducted qualitative research from a critical realist perspective, to identify the mechanisms that support the working dynamics of OCs. We introduced the concept of affordance, as the possibility for goal-directed actions provided by an object in a relation to a goal-oriented actor, to identify generative mechanisms [16]. We identified four affordances for collective action in OCs; Circulating Information, Connecting People, Triggering Actions and Crossing Boundaries. The results and lessons to be learned from this paper should help practitioners to better manage OCs, as well as researchers to progress the study and the understanding of OCs working dynamics, to better understand the relationship between technology and social actors [17].

2 Theoretical Background

2.1 Online Communities

A community consists of a group of people in a closed area who share values, historical experiences and beliefs, being identifiable by specific geographical boundaries and membership status [18]. An OC is a community where the usage of technology allows to overcome the limitations imposed by the geographical boundaries [13], and is a persistent collection of people sharing common interests, who primarily communicate through the Internet [2].

OCs offer many different opportunities to organize social discussion and establish connections with people. Shirky [19] provides a simplified, yet illustrative classification of various forms of OCs, by proposing a three-step ladder of group compilation. *Sharing* is the most basic form of OC, and corresponds to a setting where every participant is called to share online. *Cooperation* is a more complex form of OC, where every participant shall behave in a way to synchronize with the others and sustain a collaborative production [20]. Community members have to establish cooperation to negotiate and make collective decisions. *Collective action* is the most advanced form of OC. In such an OC, members share responsibilities, hence the identity of the individual blurs in favor of that of the group. Community members are called to make community decisions, which will bind both the behavior of individuals and that of the community as a whole. A strong and shared vision is a necessary guiding force to keep the community together, in spite of episodic decisions that will inevitably displease some of the members [19].

Managing an OC for collective action is more difficult than managing one for information sharing or collaboration. Collective action implies that members with common interests and objectives, and a shared understanding of everyone being better off with that objective being achieved, logically will work together to achieve that purpose [21].

The organization of collective actions is usually an uncertain and complex undertaking, in which boundaries and internal characteristics must be established. The ways in which collective action is organized, coordinated, and produces collective outcomes, are frequently discussed in the literature [15]. The management of collective actions within online communities may be influenced by complexity related to size, diversity, and the type of work being created.

2.2 *Critical Realism*

The inseparability of technology and human agency is seen as a promising direction for fruitful investigation of technology, people, and organizational related phenomena within the field of information systems [22, 23]. *Critical realism* recently emerged in the information systems literature [24, 25] where researchers leveraged on its capabilities of understanding complex technological and organizational structures as inseparable entities [17], recognizing that the deep interconnectedness of technology and organization materializes through patterns of interactions [16, 17, 26].

Critical realism is based on the foundational work of the philosopher Bhaskar [27, 28], and raises as an alternative to both the positivist and the interpretive paradigms, leveraging on both of them to provide a new approach to generating knowledge [29]. Critical realism is based on a realist ontology, a fallible, *critical* in a Kantian sense, epistemology [30], and supports the need of a pluralism of methods and methodologies to investigate reality [24]. Since correlational analysis fails to identify the mechanisms that produce observed associations [31], there is a need to study complex patterns to explicate mechanisms that generate and explain associations between events [31]. Ontologically critical realism posits for a three layers stratification of the reality encompassing the *real*, the *actual*, and the *empirical* layer. Consequently phenomena are reflected differently at the three levels [16]. The *real* contains all the objects that exist in the reality and produce effects regardless of individual perceptions. The *actual* layer contains all the mechanisms that allow objects of the *real* layer to produce effects, events or outcomes, both observable and non-observable. The *empirical* layer contains a subset of the mechanisms of the actual, which can be empirically observed.

To understand a phenomenon in a critical realist perspective it is necessary to uncover the generative mechanisms that are associated with it, and that retroduce empirically observable things, to the structures and the properties of objects in the reality [17], to provide a causal explanation of how and why things happen [16]. Mechanisms are ‘frequently occurring and easily recognizable causal patterns that are triggered under generally unknown conditions’ [32, p. 45]. A *retroduction* is hence a path that extends from the observable events to the underlying mechanisms that could logically have produced them [17]. Retroducing means moving from experience to the potential existing structures or mechanisms in the real domain investigating the interactions which may potentially have generated the event [24]. This is done through what may be called an ‘analytic induction’ process, where

researchers postulate mechanisms based on intensive examination of particular cases, working backwards from the observed outcome to the theoretical mechanisms [33].

Generative mechanisms possess capacities to induce an effect, either by enabling or constraining actions arising from the structure, relationship between structures, or relationship between structures and actions [16]. Generative mechanisms are causal in nature [34].

2.3 Affordances as Generative Mechanisms

The concept of affordance originates from the work of Gibson [35, 36]. An affordance is the interaction between an actor and the environment surrounding it, and the properties of both the actor and the environment [36]. The affordance concept suggests that individuals perceive objects in the environment not just for what they are (i.e. for their properties), but for what they allow them to do (i.e. afford) [37]. Affordances are neither properties of the environment, nor characteristics of the individual. Affordances emerge in the interaction between an actor and an artifact [38], and are related to the action capabilities of the actor reflecting the action potential of the artifact [39]. Affordances need to be perceived and actualized by goal-oriented actors to achieve outcomes [37, 40].

The concept of affordance has become popular in the area of IS to explore how the materiality of objects favors, shapes, invites, and constrains specific uses [41]. Also, it was used to describe action possibilities allowed by material properties within IS [37]. Within studies of the symbioses of IT and organizations, Zammuto et al. [41] propose the concept of affordances for organizing as a bridging concept to explain the intersection between IT systems and organizational systems. Affordances allow the examination of how goal-oriented individuals interpret (and actualize) material properties within IS to create changes in organizational practices [42]. Hence affordances not only relate to the individual level, but also to the action potential level for what an organization can do with information systems with the intent to support organizational goals [39].

Organizational affordances relate to “the potential actions enabled are associated with achieving organizational-level immediate concrete outcomes in support of organizational level goals” [43], produced by the collective actions of the individuals. Aligned with this view, Leonardi [44] introduces the concept of shared affordances, in which individual actors manifest a similar use of technology features, and argues that affordances at the organizational level are only actualized when (individuals) actors agree on the usage of a similar sequence of technology features.

Our motivation for introducing the concept of affordances within critical realism originates from the contributions in the literature that find the entanglement of technology/people/and organization, on which we are focusing in this paper, embedded in the concept of affordance [16, 44]. Moreover, Volkoff and Strong

make a parallelism between the concept of affordance and that of generative mechanism [16]. They find that affordances help clarify the stratification process (within the critical realist domain) in several ways.

First, affordances exist in the real domain, representing the potential for action rather than action itself. Second, affordances exist whether or not we are aware of them, where the actual affordance being observed allows the retroduction to underlying real affordances. Third, while actualized phenomena are specific, the underlying real affordances are more generic, allowing for theories of IT-associated organization change to be developed [16], opening up the black box of IT systems to better explain interactions over time in virtual collaborations [41].

In this paper we adopt the concept of affordance to retroduce from the empirical layer to the real layer to identify the mechanisms that support OCs working dynamics with a qualitative research strategy focusing on the investigation of M5S' OC, relying on the prescriptions of Wynn and Williams [29] for critical realist studies.

3 Research Design

Data were collected from different sources including interviews, observations of software platforms, technical reports and documents. The data were organized and recorded in a research database for qualitative analysis. The semi-structured interviews served as the primary basis for our analytical efforts, while the other data sources complemented it to provide the contextual background and to achieve a good understanding from which researchers could reflect on the research subject [45].

We interviewed various key actors of the M5S' OC. Since the community is active on the whole Italian territory, we interviewed actors with different roles—representatives in national and regional assemblies, subscribers, followers non members—coming from two cities (sites), and from the national parliament, to give us a good perspective on the internal working dynamics at the different levels. 19 semi-structured interviews were conducted, tape-recorded, and transcribed. Archival data included the M5S' website (its headquarter), several units' web pages at national, regional and local levels, the statute and other internal documents from the movement.

The data collection and analysis were conducted in tandem to benefit from the emerging recursive understanding between theoretical concepts and empirical material. Hence, theory generation is not the result of a linear process, but rather of an iterative process in which data and insights from the first round influenced data-gathering activities in the second round. The analysis began with the evidence emerging from the data, proceeding with the description of structures and contexts aligned with the second prescription of Wynn and Williams [29].

First, we used open coding individually to identify concepts. This process yielded an initial set of concepts that were discussed by us in order to identify the main concepts and structures. Second, we identified affordances to retroduce observations to the structures existing at the real level. At the same time, we confronted our hypotheses on the existence of mechanisms and structures and their causal power.

A main criterion for the identification of mechanisms and structures and the formulation of causal explanations was the empirical corroboration of findings [29]. The affordances produce immediate outcomes and events that are empirically observable: we looked for them in our empirical material by investigating our data sources to identify actual events, allowing us to identify the existence of an affordance in use and therefore to retroduce it at the real level. While identifying affordances, we were aware of the potential existence of different kinds: empirically observed, actualized but not empirically observed, exercised but not actualized, not exercised and desired, and the interrelation among different affordances.

4 Case Description and Findings

Due to space limitations this section briefly introduces and discusses the Italian M5S. A more detailed description is provided by Federici et al. [46]. M5S is an Italian political movement that sharply distinguishes itself from traditional Italian parties, as it claims to be more open, transparent, and participative. Since the origin the M5S has developed to a large nation-wide OC, managed through a different and evolving set of ICT tools, with approximately 100,000 people already enrolled, and 700,000 in line to be. The M5S uses the OC to perform activities related to the dissemination of political information, consultation, and decision-making processes involving citizens, who must subscribe to the movement in order to perform actions online. It is also used by citizens to discuss and debate topics of common interests and is divided into groups of local, regional, and national interest. The OC developed out of the blog of Beppe Grillo, who is one of the founders of the movement and still its most prominent member. The M5S' OC used at its birth the Meetup social networking platform (www.meetup.com) to better coordinate the activities of groups, which since then are called *meetups*. Later on, they started to use several ICT tools to manage the OC. A set of core tools allows the interaction between representatives elected in the parliament subscribers, and local groups. Currently, there are 1,487 active groups in 1,216 different cities and across 21 countries. Tools adopted by M5S' OC consist of a mixture of general-purpose social networking platforms (like Facebook and Twitter), and specifically developed tools (like the M5S Operating System and the Parelón).

The OC works under the coordination of the M5S's legal entity, which was officially established in 2009. Actors in the M5S' OC are differentiated into 'certified' (whose application has been approved by the movement's staff), and 'not yet

certified' (whose application approval is still pending). Only certified actors have full access to the M5S' OC. Non-certified users are limited in their ability to act in the community.

One of the main reasons for people to take part in an OC is to do things together. This involves both creating and circulating information, and making decisions on aspects of interest both for the individual and for the community: "*Usually I get a general overview, and then I go into details when I find news that it is interesting to me.*" [Follower non member].

Another need is that of facilitating the establishment of direct relationships for information circulation, providing continuous feedback and feeding a debate. "*My aunt sympathizes for the movement, she is not an activist, but she is in the activists' group. So she can post in the activists' group,... she can communicate her own ideas.*" [Subscriber in charge of communication in a local group]. Such connections are supported by technologies for cross-individual communication, including social networking platforms, micro blogging, instant messaging tools, and e-mail. All members, whatever their role in the community, and also non-members are allowed and encouraged to participate to discussion, both collective and one-to-one.

Nevertheless the community has also mechanisms to call members to their duties in specific moments of the community life: "*I just use [the system] when Grillo calls to the participation on the blog.*" [Subscriber of a local group]. The aims of such calls to action are of two levels: first allowing members to be continuously in touch with current processes, getting informed in a timely manner of actions to be taken. At a different level this makes collective actions easier for members, possibly increasing the number of active members in each process. Members in charge to call to action use for this aim technologies with which they can even target communication directly to specific community members, like social networking platforms, micro blogging platforms, and instant messaging tools. Recipients are free to ignore the call to action.

The mechanisms, through which the community members are explicitly asked to perform actions online, are usually connected with a structured decision making process. Besides this call of duties, each individual is in the position to voluntarily activate the community, do things online, and stimulate actions by other community members.

Sometimes the collective action crosses the community boundaries to enter other organizational settings or communities: "*I posted a picture of one of Grillo's show really crowded using their same hashtag [that of a rival party]. This allowed me to cross the boundaries of the community.*" [Subscriber in charge of a local Twitter account]. Any member may spread information outside community, but there are also some members with boundary-spanning roles. They use several technologies like blogs, social networking platforms, microblogging platforms, mailing lists, and websites. The final aim is that disseminating individual and collective action to a wider audience, also entering other communities whenever needed.

5 Enhanced Understanding of Online Collective Actions

To study the working dynamics of OCs we performed a retrodution process from the empirical evidences to the reality, using the concept of affordance to identify the generative mechanisms. The aim of the retrodution process was that of identifying the organizational affordances to determine the causal explanations existing within our data [16], in order to identify both the individual and collective mechanisms that sustain the collective action of an OC. We identified four affordances through this process, they are described in detail below:

- Circulating Information
- Connecting People
- Triggering Actions
- Crossing Boundaries.

With regard to *Circulating information*, we observed in the empirical domain that subscribers and non-members of the M5S use tools, such as Facebook, Twitter, Meetups, or forums, to share information and to take part in the discussion on topics of interest. Each of them can disseminate and circulate information according to the limits and boundaries of their role. It may be discovered in the real domain that such mechanism allows the OC to coordinate a variety of online tools, whose access is shaped by rules and by roles assigned or taken on by members to let information circulate among members.

As regards the affordance *Connecting People*, in the empirical domain there are evidences that members of M5S can easily reach each other. They can also reach members who are in different sections of the community or play different roles. The central staff of M5S partially maintains the network through the administration of M5S' own tools, at the same time leaving freedom for people to connect through other tools. Related to this, in the real domain organizational structures include the retention of an effective structure within internal IT-artifacts, maintaining flexibility by allowing the use of external and trivial services. Such a mechanism allows people to establish connections independently of their roles and positions in the network.

When referring to the affordance *Triggering Actions*, in the empirical domain it may be noticed that there is a large amount of activities within the M5S spread across various platforms and services, resulting in a web of activities within which actions are made. Actions are sometimes voluntary, and at other times stimulated by community members who play specific roles. When moving to the real domain, this affordance allows specific community members to call the rest of the community to action, for example to participate in discussions or decision making processes. Such a call to duties is performed through triggers that are activated by those members who embody specific roles, or are legitimated to do that by rules.

The last affordance, *Crossing Boundaries*, relates to the fact that discussions related to the M5S not only occur within their own OC, but in some cases reach a larger public outside of the OC sphere, through tools such as Facebook, Twitter,

and forums, or through the actions of people, like the spokespersons, who play the boundary spanner role. This mechanism, moving into the real domain, allows the OC to manage boundary-crossing activities, by assigning roles to members who can perform the activity, by defining rules on how individuals should behave when crossing the borders, and by providing tools allowing circulating information to be addressed outside the community.

6 Discussion of Results

On the basis of a critical realist qualitative study, we analyzed the mechanisms that sustain the collective work of the M5S' OC. We identified four affordances, describing mechanisms that underpin OCs collective action. The contribution of our paper builds on the concept of affordance under a critical realist perspective within the domain of online communities. Our contributions provide value for each of these three different areas, which will be discussed in this section.

The four identified affordances explain how OCs sustain the dynamics of collective action. Although inspired by similar approaches by other scholars in this area [42, 43], our approach extends the conceptualization of affordances by including the specific organizational settings and the relevance for specific individuals to achieve specific goals through the use of technology. Strong et al.'s [43] extension of the concept of affordance to the organization level has been an important reference for our study.

Affordances have a relative nature [39]. Affordances are relative not only to the individual and the technology, but also to the individuals who actualize them [37, 40], implying that affordances actualized by some individuals might be of no use for other individuals. Hence, the affordances we have identified provide a fruitful starting point for research, by applying them to different empirical settings. Researchers could extend our theoretical contribution, on the one hand by identifying different affordances, and on the other hand by confronting different working dynamics of different OCs through comparative studies.

Thank to the adoption of a critical realist perspective, we were able to investigate the complexity of the interactions among people, technology, and organization inside OCs, while maintaining the dual perspective of seeing them intertwined and exploring the separation between them. Critical realism is a promising research approach in the IS area that makes it possible to discuss causality explanations within organization-related IT phenomena [29, 47–49]. The current literature on critical realism from an IS perspective focuses mainly on epistemological aspects and methodological principles [24, 29]. To date, only a few studies use critical realism to investigate empirical phenomena [25, 49].

7 Conclusions and Future Research

This paper contributes to the discourse on OCs by bringing in novel perspectives, describing the collective working dynamics of an OC through a set of affordances. Such an approach to the study of OCs targets the understanding of the practices and the dynamics that sustain collective action in OCs. Our work does not focus only on individuals, rules, or technology (like most previous studies do), but complements them by proposing causal explanations of the dynamics of online collective actions, identifying how people with individual goals play specific roles, using technologies with specific features, and following rules from a surrounding organizational environment. By so doing, we explore the intertwined interactions among these major components of an OC, in order to sustain and explain its working dynamics.

In summary, the paper unveils a more complex understanding of the OCs phenomenon, explaining how the different components (people, technology, and organization) interact within a specific mechanism (an affordance) to achieve a specific result. Furthermore, having identified four affordances, our work could inspire comparative studies to confront different affordances from different systems or contexts to further expand our knowledge on affordances.

Our results are promising for fruitful future research projects. First, the nature of our identified affordances should be further investigated to deepen our understanding of collective actions within OCs. On the side of the motivation of people joining OCs, one question that might be explored is how to balance activities related to triggering participation with activities related to voluntary participation to avoid negative influences (constraints) between them. More research is needed to better understand how crossing boundaries roles and rules may extend the information circulation from inside to outside the community. Secondly, we believe that our work can contribute as guidance on how to investigate IT and organization-related phenomena from the critical realist perspective, especially in the field of OCs. Finally, the situational nature of mechanisms [49] should be investigated: different combinations of the same mechanisms might lead to the same result, or the same combination of mechanisms might lead to different results.

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