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(Article begins on next page)

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Sustaining multiple logics within hybrid organizations: Accounting, mediation and the search for innovation

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Abstract:

Purpose – This paper explores how accounting and control practices contribute to the persistence of the multiple logics that characterise hybrid organizations, i.e. organizations that constantly incorporate elements from different institutional logics at the very core of their identity.
Design/methodology – We draw on the literature regarding institutional logics and on studies exploring the enabling power of accounting to interpret the findings derived from a longitudinal case study of a hybrid organization operating in the field of brain-computer interface technology.
Findings – Our study shows that the persistence of conflicting logics and innovation within hybrid organizations can be sustained through the mediating role of accounting and control practices. By engaging different interested parties within processes of innovation, these practices can establish complex interconnections between conflicting perspectives and their objects of concern. Consequently, accounting and control do not address a specific logic but instead contribute to lock different parties to their own logic, allowing them to engage and generate innovation while maintaining their diversity.
Originality/value – Whereas previous studies have explored mechanisms for keeping the multiple logics of hybrids separate or for reconciling them, our paper shows that conflicts between these logics do not need to be reduced but can be mediated to generate innovation. Additionally, we contribute to the literature on accounting 'in action', by illustrating the role of accounting and control practices as boundary objects that act within a broader 'ecology of objects' through which innovation materializes in a context of enduring institutional pluralism.

Keywords:

hybrid organizations; institutional logics; accounting and control; boundary objects; innovation

Article type:
Research paper

Acknowledgments:

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Prologue

"Mr Mario[1], is your grandchild's name Anna?" - The laptop answered "No".
"Mr Mario, is your grandchild's name Silvia?"- The laptop answered "No".
"Mr Mario, is your grandchild's name Emma?"- The laptop answered "Yes".
"Mr Mario, can you hear me?" - The laptop answered "Yes".
At this point, Mr Mario's daughter cried with joy. She finally realized that her father, who had been lying in bed in an apparent coma for almost one year, was still there and could hear her.

"I was truly happy to see Mr Mario's daughter crying for joy thanks to BrainControl, the device we developed at Liquidweb", explains the company's founder and CEO, who continues, "our dream is to help thousands who are in a similar condition around the globe. Approximately 75,000 patients all over the world are in apparent coma, and the more than 3 million who are affected by degenerative neuromuscular diseases do not seem to be numerous enough to justify high support and funding […]. We had to learn ways to look for additional funds and manage our time effectively so that we could fund our operations while keeping our dream alive".

1. Introduction

Liquidweb is one of the numerous examples of 'social enterprises' that are currently gaining relevance within contemporary societies as they attempt to fulfil their social mission as well as achieve their commercial performance (Battilana and Lee, 2014; Pache and Santos, 2013). Established in 2010, Liquidweb's mission is to leverage brain-computer interface technology to design and develop assistive applications for those who are affected by degenerative neuromuscular diseases such as multiple sclerosis, amyotrophic lateral sclerosis and ischemic or traumatic injury. Similar to other social enterprises, Liquidweb embodies the key features of a *hybrid organization* (Kraatz and Block, 2008), i.e. an organization that constantly incorporates, at the very core of its identity, elements from different institutional logics – social and commercial, in the case of Liquidweb. Therefore, it needs to find how to deal with the competing demands to which it is unavoidably exposed (Battilana and Dorado, 2010).

Hybrid organizations have been on the agenda of management and organizational scholars for some time now. The simultaneous presence of competing institutional logics and the resulting necessity to manage the divergent demands that these logics encompass, have posed interesting questions regarding the existence and functioning of these organizational forms (Pache and Santos, 2013). Arguably, the complex environment of a hybrid organization challenges the theorization of organizations as entities performing a single coherent institutional template (DiMaggio and Powell, 1983). In this context, the maintenance of heterogeneity and variation, rather than the search for homogeneity and harmonization, represents an essential feature that has to be preserved to guarantee the existence and functioning of the hybrid (Battilana and Lee, 2014). Nevertheless, how competing institutional logics persist within hybrid organizations is still far from clear and deserves further research.

Institutional logics have been described as rules and beliefs that shape the cognition, decision-making and behaviour of actors, as well as their conception of ends and means within fields of activities (Dunn and Jones, 2010; Scott, 1987). While the multiplicity of institutional logics is likely to be experienced by any kind of organization at some point (see, among others, Thorton *et al.*, 2012; Purdy and Gray 2009; Lounsbury, 2008), the enduring co-existence of multiple logics is a peculiar

[1] The real names have been disguised for reasons of confidentiality.

feature of hybrid organizations (Battilana and Lee, 2014; Dunn and Jones, 2010; Pache and Santos, 2013), in which, in contrast to other types of organizations, the combination of multiple logics is central and persistent, rather than adaptive and transitory[2].

A number of studies have researched the strategies and the mechanisms through which hybrid organizations ensure the co-existence of multiple logics by managing their inherent conflicts (see, for a review, Pache and Santos, 2013). While institutional research points to 'decoupling' to illustrate how organizations may ceremonially endorse practices prescribed by one logic while actually implementing mechanisms promoted by another logic (e.g., Bromley and Powell, 2012; Crilly *et al.*, 2012), other studies focus on 'reconciling', in order to describe attempts to reconcile competing demands from various current and potential stakeholders (Kraatz and Block, 2008; Oliver, 1991). These perspectives recognize the force of external pressures on hybrid organizations, which, in turn, are called upon to deal with their intrinsic institutional pluralism either by keeping the multiple institutional logics separate or by attempting to reconcile them internally.

Although this literature does contribute to shed light on the key challenges featuring hybrid organizations, it mainly focuses on strategies that lead to harmonization and closure, rather than on the mechanisms that facilitate variation and openness. For this reason, as Pache and Santos (2013) suggest, it reveals little about how multiple institutional logics persist over time and sustain processes of innovation within the context of hybrid organizations. Aiming to address this gap, the purpose that underpins our study is to understand the possible mechanisms in place and, more importantly, how they work in practice.

Specifically, within this paper we build on the rich body of literature regarding accounting 'in action' (see, among others, Messner, 2009; Roberts, 2009; Preston *et al*., 1992) in order to explore how accounting and control practices contribute to the persistence of the multiple logics that characterise hybrid organizations. These studies highlight the enabling power of accounting (Ahrens and Chapman, 2004; Abernethy et al., 2004) and place it amongst those "boundary objects" that allow organizations and its members to act (see, for instance, Briers and Chua, 2001). Within this context, accounting practices have been portrayed as offering a space for engagement that attracts diversity and generates organizational action (Busco and Quattrone, 2015).

Our paper contributes to the existing literature by highlighting how accounting and control practices work as boundary objects within hybrid organizations by mediating processes of innovation while ensuring the persistence of the conflicting nature that is embedded in the core of their identity. Drawing on the material collected in the case of Liquidweb, we suggest that this is so, not because accounting and control homogenise or reconcile the existing logics, but rather because they allow degrees of diversity to coexist and generate innovation. Therefore, rather than looking at the specific contents they convey, we shed light on how accounting and control enable actions by establishing and sustaining connections amongst the different parties, interests and concerns that these practices encounter. It follows that, as the journey of hybrid organizations unfolds, accounting and control practices sustain the conversations generated by and around an 'ecology of objects' at work (Nicolini *et al.*, 2012).

The paper is structured as follows. Section 2 illustrates our theoretical perspective that draws on institutional theory to understand the challenges of institutional complexity for hybrid organizations. Then, Section 3 builds on the literature regarding accounting 'in action' to discuss and problematize the potential role of accounting and control practices in dealing with institutional complexity within hybrids. Section 4 introduces the case study and the research methodology. The hybrid nature of Liquidweb and the conflicts between institutional logics are discussed in Section 5. Next, in Section 6, we introduce the main accounting and control practices that are in use within

[2] As explained by Battilana and Lee (2014, p. 400), "For example, a mule is a hybrid, but a chameleon, due to the contingent nature of its multiple forms, is not".

Liquidweb. Then, in Section 7, we examine the mediating role played by these practices in ensuring the persistence of multiple logics, while channelling their inherent conflicts into processes of innovation. In Section 8, we discuss this mediating role in light of the ecology of objects that are at work within Liquidweb. Finally, Section 9 summarises the main findings and outlines the opportunities for further research.

2. The multiple logics of hybrid organizations

Social enterprises are described as ideal settings within which to explore the key features and challenges of hybrid organizations (Battilana and Lee, 2014). This is due to the fact that they constantly combine elements of social welfare logic and commercial logic simultaneously, and, that, at the heart of their identity, they experience unique dilemmas caused by the conflicts that are likely to occur between these two logics (Santos, 2012; Tracey *et al.*, 2011; Dacin *et al.*, 2011). As argued by Pache and Santos (2013):

> "Just as social enterprises need to address these dilemmas to operate, *all hybrids* need to find ways to deal with multiple demands to which they are exposed [emphasis added]" (p. 972).

In addition to social enterprises, other examples of hybrid organizations include microfinance organizations (which combine banking and social development logics – see Battilana and Dorado, 2010); public-private partnerships (which combine public and private logics – see Jay, 2013); corporatized institutions of higher education (Parker, 2012; 2013); R&D firms (which combine the logics of market with academic research – see Lamb and Davidson, 2004); biotechnology companies (which combine science and market logics – see Powell and Sandholtz, 2012). All these types of companies embody elements of at least two different institutional logics as a *persistent* feature of their identity. Such persistence (i.e. the enduring co-existence of the different logics) is a peculiar characteristic of hybrid organizations (Battilana and Lee, 2014) and has been regarded as a relevant source of innovation, as hybrid organizations can gain from the best from each logic (Jay, 2013).

However, institutional studies have also emphasized that multiple and heterogeneous logics struggle to persist over time, as they are modified through the dynamic tensions between the different groups of power and interest that advocate for distinct and multiple logics simultaneously (see Dunn and Jones, 2010; Reay and Hinings, 2009; Purdy & Gray, 2009). At an organizational level, this lack of persistence may result in processes of change (Greenwood *et al*., 2011; 2010) as the organization, like a chameleon, tries to couple with evolving dominant logics under shifting conditions. According to Battilana and Lee (2014), this chameleon cannot be defined as a hybrid because it adjusts its features to evolving contingent logics over time. On the contrary, to sustain their hybrid nature, hybrid organizations have to sustain the persistence of their heterogeneous logics at the core of their processes. This form of persistence involves various challenges, because of the internal and external tensions typically faced by hybrid organizations (Jay, 2013).

External tensions comprise the need to gain legitimacy from different groups of interests sustaining different institutional logics. For example, social enterprises on one hand need to gain legitimacy from the world of social welfare in order to obtain grants and donations and on the other hand from the market in order to obtain financial capital. When the degree of incompatibility between the two logics is high, the different groups will have competing demands and expectations, which may lead the enterprise to shift towards one or the other logic in search for legitimacy from the dominant group (Kraatz and Block, 2008; Pache and Santos, 2010; Jay, 2013; Battilana and Lee, 2014). This shift will, of course, compromise the hybrid nature of the enterprise.

Internal tensions may arise from the co-existence of multiple identities among employees sustaining different logics (Battilana and Dorado, 2010). When the degree of incompatibility between logics is high, hybrids are likely to face challenges in allocating resources among activities that satisfy different logics (Moizer and Tracey, 2010; Battilana and Lee, 2014). Especially when resources are limited (such us within startups and small companies), growth processes and the need to make a trade-off between resources for conflicting objectives are likely to cause drifts from one logic to another, to the detriment of the hybrid nature of the organization (Bradach, 2004).

While some of the tensions mentioned above can be experienced by any kind of organization at some point, hybrid organizations face unique challenges in the management of those tensions since they cannot shift, like a chameleon, towards the dominant logic while maintaining their hybrid nature. Rather all the different logics need to co-exist and persist as distinguishing features of the hybrid. As emphasized by Pache and Santos (2013), hybrid organizations:

> "are exposed to long-term institutional pluralism, which requires them to incorporate competing logics over the long run, rather than in a temporary fashion" (p. 973).

In light of these challenges, hybrid organizations are required to sustain their hybrid nature over time by searching for *ad hoc* arrangements to ensure the ongoing co-existence of competing logics. In this respect, researchers have suggested that hybrid organizations attempt to manage their challenges in three main ways (for a review, see Pache and Santos, 2013). One way is to keep the conflicting logics separate through decoupling mechanisms (Meyer and Rowan, 1977). This means that although a specific set of practices is used to accomplish a certain logic symbolically, at a different organizational level other practices are used to endorse the competing logic. Compromising mechanisms have been also regarded as possible ways for managing competing logics. For example, *ad hoc* governance arrangements (Chen and O'Mahony, 2007; Lounsbury, 2007) are often used to reconcile conflicting demands by searching for an acceptable balance between multiple expectations.

However, though both decoupling and compromising mechanisms can be successfully used to manage tensions in the short term, in the long run they are likely to fail (Tracey *et al.*, 2011). For example, with decoupling mechanisms it is very difficult to avoid the scrutiny of the different groups of interests over a long period of time. Also, within compromising mechanisms, the power struggle between the different groups of interest is likely to cause dissatisfaction between the groups in the long run. Other studies have suggested a different way to manage tensions between competing logics, which is by combining elements of the competing logics in order to reconcile conflicting demands. These strategies include the selective coupling of practices (Pache and Santos, 2013), the adoption of hybrid practices (Miller *et al.*, 2008), and the use of hiring and socialization practices (Battilana and Dorado, 2010).

In all situations described above, (decoupling, compromising and combining mechanisms), the persistence of multiple institutional logics at the organizational level is ensured by adopting strategies and mechanisms for resolving tensions and eliminating conflicts, rather than sustaining them over time. These interpretations tell little about *how* heterogeneous institutional logics may persist within hybrid organizations and, consequently, stimulate innovation *because of* their conflict.

In this respect, organization studies on tensions and paradoxes suggest that conflicts between competing forces (such as the conflicts between competing institutional logics) may represent sources of competitive advantage, learning and innovation (Lewis, 2000; Jay, 2013). It is the enduring 'tension' between the competing forces that ensures that none of them ever becomes extreme and therefore dysfunctional. While the literature on hybrids concentrates on solutions for eliminating conflict and reducing institutional complexity, the mechanisms for sustaining these tensions and channelling their struggle into innovation processes require further research. Aiming to address this gap, in the next section we draw on the literature that explores how accounting practices deal with multiple groups of interest and their inherent conflicts.

3. Dealing with multiple logics: the role of accounting practices

Within the accounting literature, institutional studies have highlighted that, when facing institutional complexity, multiple logics are likely to shape variation in accounting practices (Lounsbury, 2008). Accounting has been portrayed as a *decoupling* mechanism within which specific practices are used ceremonially to satisfy a specific institutional logic, while actually implementing distinctive practices promoted by other logics (see, for example, Rautiainen, 2010). By keeping conflicting logics separate through decoupling mechanisms, accounting sustains persistence of existing arrangements, conflicts are resolved and the impact of institutional complexity is neutralised (Siti-Nabiha and Scapens, 2005).

Other studies demonstrate that accounting can be used to reconcile conflict by *combining* elements from the different logics (Thomson *et al.*, 2014; Miller *et al.*, 2008). For example, Contrafatto and Burns (2013) show that multiple accounting practices (management accounting, social and environmental reporting practices) can unfold over time to embody different and conflicting demands (such as social, environmental and economic demands). Contrafatto (2014) suggests that apparently irreconcilable objectives (environmental, social and financial) can be reconciled through an ongoing process of shared sense making.

The studies reviewed above suggest that, when facing multiple and competing logics - such as within hybrid organizations - accounting can be used to manage conflict through decoupling, compromising or combining mechanisms. However, and despite the richness of this literature, Contrafatto and Burns (2013) suggest that we should be cautious in simply extending the functioning of traditional accounting techniques to include elements of competing demands and objectives (such as social and environmental logics). Building on that, we draw on studies that have focussed on accounting 'in action' and on the concept of boundary objects to explore how accounting and control practices may contribute to the persistence of the multiple logics that characterise hybrid organizations. In doing so, we portray accounting and control practices as mechanisms that lead to mediation and openness, rather than harmonization and compromise.

3.1. Accounting and control practices as boundary objects

Over the last thirty years or so, accounting literature has acknowledged the multiple roles played by accounting practices within organizations and societies (Hopwood, 1987). Aiming to understand the transformative capacities of accounting 'in action' (Preston et al., 1992), a number of contributions have focused on accounting's enabling potential (Ahrens and Chapman, 2004; Abernethy *et al*, 2004), while others have illustrated how accounting and accountability systems engage users in practice (Messner, 2009; Roberts, 2009).

According to this literature, the enabling power of accounting practices has placed them amongst the *boundary objects* that allow organizations and their multiple stakeholders to act (Star and Greismer, 1989; Star, 2010). Boundary objects are defined by their capacity to serve as bridges between intersecting social and cultural worlds. They provide a common language that enables different interested parties, internal and external to the organization, to engage and communicate. Because of their capacity to intersect social and cultural worlds, boundary objects require "deep sharing" (Nicolini *et al.*, 2012), which allows for communication between actors (Carlile, 2004) and provides a common ground between different communities.

However, Star has stressed how the concept of boundary objects was originally considered as an explanation of how certain artifacts "allow different groups to work together *without consensus*"

(2010, p. 603, emphasis added). She continues by saying that her "initial framing of the concept was motivated by a desire to analyze the nature of cooperative work *in the absence of consensus*". In the case studies she observed that "*consensus was rarely reached* [...] *but co-operation continued*, often un-problematically" (2010, p. 606, emphasis added). Along these lines, research shows that situations in which parties internal and external to the organization share transparent information and reach agreement are the exception, rather than the norm (Cohen *et al.* 1972). In practice, one often observes situations in which both individual and collective objectives, needs and interests, as well as the means for achieving and satisfying them, are not well understood, are highly uncertain or are always in the making, as well as often being dissimilar and in conflict (see Jørgensen and Messner, 2010).

In this context, boundary objects should be robust enough to bring different groups together, but flexible enough to adapt to their distinctive needs (Doganova and Eyquem-Renault, 2009). For example, in the field study explored by Hopper *et al.* (2008) on a subsidiary of a chemical company, World Class Manufacturing performed as a boundary object. Although the overall package was presented as a set of interrelated techniques, it was flexible enough to be adapted to meet different concerns about competitiveness. This malleability allowed a constellation of actors to define new but mutually acceptable techniques of measurement and accountability within a process of translation and mediation.

As showed by Briers and Chua (2001), accounting practices can provide different types of boundary objects. Some practices (such as data repository containing information on cost, sales and inventories) can hold different groups of experts together without having to negotiate their differences in purpose. Other practices (such as activity–based costing in the case explored by Briers and Chua, 2001) have some features that are commonly understood and therefore attract diverse perspectives, but then have other features that can be interpreted differently from different perspectives, and therefore hold these perspectives together.

Along these lines, numerous studies have looked at how accounting and control offer a space that attracts the multiplicity of concerns and the different points of view that surround accounting numbers (see Dambrin and Robson, 2011; Qu and Cooper, 2011; Jørgensen and Messner, 2010), and have explored the role of accounting within knowledge creation and change in complex and innovative settings (McNamara *et al.*, 2004; Mouritsen and Larsen, 2005; Andon *et al.*, 2007). For example, Mouritsen and Larsen (2005) show that accounting practices can be drawn upon to identify new or hidden relationships between the apparently chaotic situations that characterize highly innovative settings. By relying upon the case of a worldwide provider of healthcare products and services, they reveal how intellectual capital statements can be used to relate heterogeneous elements (such as employees, procedures, technologies, customers and users) to the corporate purpose of the company, thereby creating a version of the firm that was not visible previously.

Andon *et al.* (2007) emphasize the experimental and relationally drifting nature of accounting change. They show how this nature can be explained in light of the loosely coupled and shifting collectives, and of the mediating role of the ties that are between them. Other studies highlight that accounting is not alone in managing heterogeneity within knowledge creation. For example, by relying upon the case of a fast-moving consumer goods company, McNamara *et al.* (2004) question the accounting-centeredness of previous research on knowledge creation to highlight the heterogeneous constructs that can be mobilized in this process. They show how different technologies and knowledge objects can be created and sustained within and between heterogeneous knowledge networks.

In most of these situations, accounting plays roles other than decoupling or reconciling through compromise or combination. Rather, accounting is drawn upon by users in a process of *mediation*, a process which attracts and sustains different interests and concerns, without reducing them in the search for consensus and sharedness (Busco and Quattrone, 2015). By so doing, accounting and control practices sustain heterogeneity, rather than harmonization and compromise.

However, as argued by Nicolini *et al.* (2012), the notion of boundary objects does not alone explain the power that these objects have to generate and sustain interest and motivation from multiple parties. This power can be better explained drawing on the notion of *epistemic objects* (Nicolini e*t al.*, 2012). Epistemic objects are scientific representations that provide imperfect but powerful definitions of knowledge and social beliefs (Knorr Cetina, 1997). They embody 'what one does not yet know', and the attempt to fill this void fuels the attachment to these objects, as well as stimulates knowledge development and unfolding innovation. Within this process, further issues and lacks arise therefore reinforcing individuals' interest and attachment to these objects.

Because of their incompleteness, epistemic objects not only fuel the attachment of individuals to objects, but also amongst groups of individuals (Knorr Cetina, 1997). Importantly, building on the above, Nicolini *et al*. (2012) suggest that exploring the nature of boundary objects requires us to understand them as part of a broader 'ecology of objects', within which multiple objects with different nature interact with each other and ultimately allow diversity to co-exist and perform.

By drawing on the studies reviewed in this section, in the remainder of the paper we intend to contribute to the existing literature by exploring whether and how accounting and control practices act as boundary objects that sustain the conflicting nature of hybrids while, at the same time, mediating processes of innovation. In doing so, rather than looking only at the specific content they convey, we aim to shed light on how accounting and control, within a broader ecology of objects, enables the multiple logics of a hybrid organization to persist overtime. To achieve this purpose, we draw on the case of Liquidweb, for which the background and methodology is illustrated in the following section.

4. The case of Liquidweb: background and research methodology

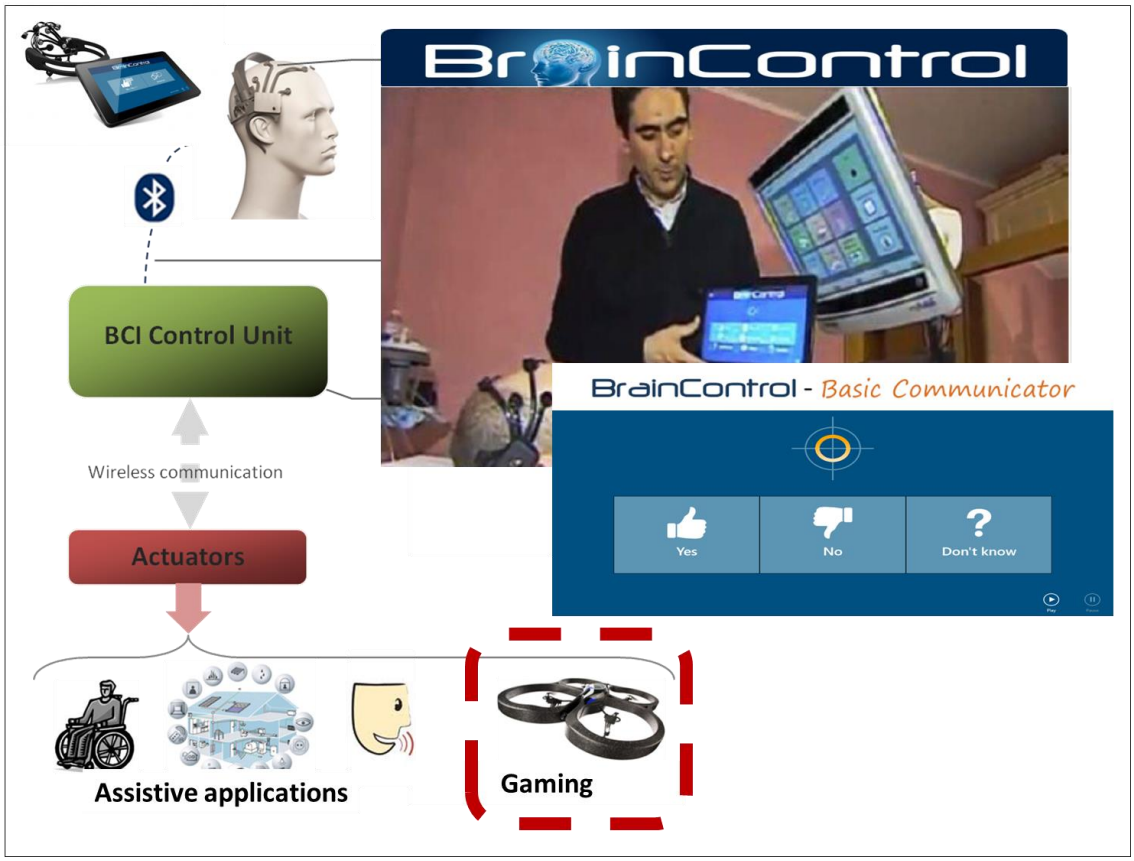
Liquidweb is a small Italian R&D company operating in the field of pervasive technologies, i.e. information technologies that provide support and assistance for the circumstances of everyday life. The company is organized into two main business areas: the brain-computing interface area and the commercial business area. The first area is based on the key technology developed by the company, that is, brain-computing interfaces, which consist of instruments that capture and use the signals of the brain in order to interact with a personal computer (see Figure 1). This technology has been applied to the design and development of a specific line of products under the brand name 'BrainControl'. These instruments can detect the specific brain activity of people who are severely disabled and convert it into electronic signals, making it possible for these people to control objects through the power of their brain. In contrast, the commercial business area is based on the development of Information and Communication Technology (ICT) solutions to meet specific customer needs, such as mobile services for workflow automation, customer relationship management, sales management, mobile payments, as well as cloud computing technologies. Within this area the company also produces ambient electronic devices and smart environment solutions.

Employees are required to allocate their time and activities within both business areas and report directly to the founder who is also the sole administrator and owner of the company[3]. They are encouraged by the founder to rely upon their skills and technical background to offer highly innovative solutions in both areas. They are also required to report daily about the activities and outcomes of the R&D process they have been working on. As we will discuss within the next sections,

[3] Currently, the company has 7 employees with backgrounds ranging from information engineering to management engineering, from accounting to medicine.

the limited resources available to the company make the tension between the social and commercial logics particularly challenging.

Figure 1 – Innovation at Liquidweb: BrainControl and its various applications

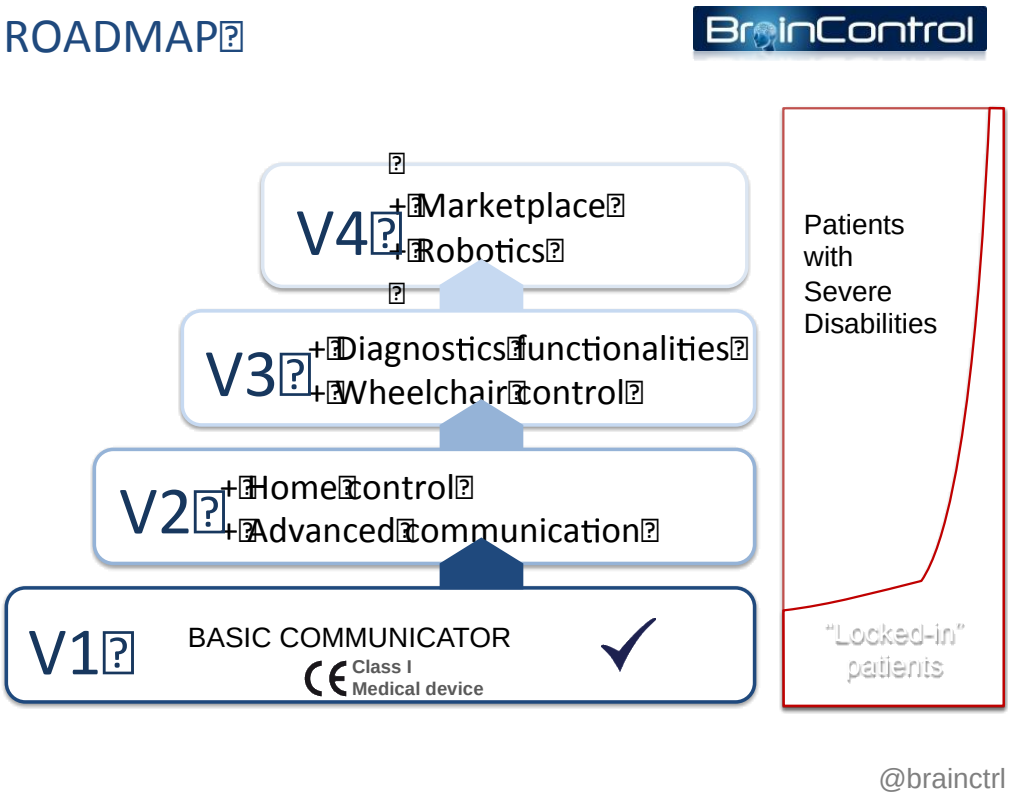


Source: Authors' elaboration from field material

Although the company is organized into two business areas, the brain-computing interface area is regarded as the core business. From the early days of Liquidweb back in 2011, the founder and his employees have been working on R&D activities leading to four different versions of BrainControl. The first (basic) version (see v.1.0 in Figure 2) is a communicator that allows disabled people to control objects (i.e. a wheel chair) with their thoughts, permitting them to transmit predefined messages and yes/no answers to a personal computer. The full-featured communicator will have additional functions, including a virtual keyboard, the ability to browse the web and interact through social networks, SMS and email functions (v.2.0).

Moreover, the third version of BrainControl (v.3.0) will include home automation or domotic functions. This will permit people who suffer, for example, from multiple sclerosis or tetraplegia to use a commercially available headset that will enable them to interact with their environment by turning the lights on or off, opening and closing doors and windows, moving and steering their own wheelchair, etc. The fourth version will include the development of a dedicated headset and increased support for third-party developers who would like to further develop applications or domotic devices based on BrainControl (v.4.0). This highly advanced model features humanoid robotics through potential applications in the exoskeleton. Each version of BrainControl is managed through *ad hoc* projects.

Figure 2 – The developmental roadmap of BrainControl



Source: Company's material

Thanks to the development of BrainControl technology, as well as to the social mission of addressing the needs of severely disabled people, Liquidweb has won several prizes and awards as a highly innovative social enterprise in Italy. Although the founder received offers from venture capitalists to exploit BrainControl's technology for the gaming industry (represented by the dotted section in Figure 1), he rejected these offers in preference of steering the company towards the current development of BrainControl technology.

The R&D of the basic version of BrainControl was supported by the founder's personal investment and research grants offered by non-profit institutions. This was not sufficient to sustain production and sales in a broad market. For this reason, the founder decided to set up the commercial business area within the company, which is based on a market-oriented logic[4]. Then the founder's decision was to reinvest the resources earned through this area into the development of BrainControl. Following this decision, the main funding for the company consists in grants and donations from non-profit agencies, the funder's equity and the retained earnings from the commercial business area.

Although these resources were sufficient to support the production of the basic version of BrainControl on a small scale, they were not enough to support large scale production. Additionally, resource shortage could seriously threaten future development of more advanced versions of BrainControl. Therefore, the founder began to look for a venture capitalist who would be willing to

[4] Currently, the commercial business area is profitable. In this area, Liquidweb's customers are mainly large or medium-sized enterprises.

financially support the company's growth. However, this search has not been easy. Similar to what has happened to other innovative scientific startups, (see, for example, Fairchild, 2011), Liquidweb has experienced various tensions when dealing with venture capitalists (being also potential financial investors), as they requested a large share of company equity with the intention of gaining control over BrainControl's production and marketing strategies.

As seen in other social enterprises, Liquidweb possesses the key features of a hybrid organization. It combines its social mission of creating solutions for assisting severely disabled people with a commercial logic, seen in the pursuit of commercial performance through the projects within both business areas. This combination has become an enduring feature of its identity and organizational form (see Battilana and Lee, 2014; Santos, 2012). Within this context, Liquidweb has had to face complex competing demands coming from the market and from the world of social welfare[5]. Interestingly, these demands have proved to be particularly challenging for the company because of the limited resources that are shared between the commercial projects for private customers and BrainControl R&D activities, as well as the high risk and uncertainty involved in complex R&D processes, which can undermine the successful outcome of a project at any time.

In light of these challenges, as well as the mechanisms in place to address them, the case of Liquidweb provides a suitable setting for exploring how the hybrid nature of the company is sustained and persists over time.

4.1. Data collection

This is a longitudinal case study conducted over a period of five years, from October 2010 through September 2015. This period covers all years of operation of Liquidweb, which was founded in 2010[6]. The longitudinal approach allows us to explore whether and how the tensions between the social and the commercial logics evolved and persisted over time (and, more specifically, the interconnectedness among the phenomena – see Pettigrew, 1990).

During this period, data for the study were obtained from multiple sources (Yin, 2009), including semi-structured interviews, direct observation of R&D activities, and presentations to potential investors and partners. Also, we analysed internal reports, business plans, and project management spreadsheets. A total of 38 interviews (see Appendix A for the list of interviews and related topics) and the direct observation of the R&D activities were conducted at the firm's headquarters.

The research began in 2010 with preliminary meetings with the founder of Liquidweb, who described his past experience and the background of the company. Subsequently, additional interviews with the founder focused on the company's strategy within the two business areas. The final sets of interviews with the founder and employees focused on the accounting and control systems used to manage all the different projects. Face-to-face interviews lasted from 45 minutes to three hours[7].

In addition to the interviews, this study relies on direct observation (Yin, 1994). Employees were observed directly during their R&D activities by a research assistant who spent about 150 hours inside the company over a period of 12 months (January–December, 2012), observing how all

[5] The competing logics that make up the institutional complexity that characterises Liquidweb are illustrated in Section 5.

[6] Liquidweb was founded in 2010 but started its operations in 2011.

[7] Early in the case study, interviews were not recorded to ensure that the informant spoke freely about the various issues (without being unduly worried about the recording). More recently, three interviews with the founder and last three interviews with employees were recorded with permission.

employees were organising and conducting their activities for the various projects. During this period of direct observation, the research assistant did not interfere with the activities of the employees (as s/he was simply an observer). S/he was allowed to take notes, and was given full access to all documents and information used for accounting and control.

4.2. Data analysis

All the data gathered were grouped according to three main topics, which were also addressed during the various interviews (see Appendix A). The first topic dealt with the background of the company and the company's strategy; the second topic explored the R&D processes of both the commercial projects and BrainControl projects; finally, the third topic concerned accounting and control practices. Subsequently, we started the analysis of the hybrid nature of the company. We relied on the data from the first topic to identify the main groups of Liquidweb's stakeholders and we used the data from the second topic to establish differences or similarities in stakeholders' interests and concerns over Liquidweb's R&D process. This analysis enabled us to identify the prevailing social and/or commercial logic of each group, as well as to compare and contrast these logics in search of eventual conflicts. The results of this analysis are reported in Section 5.

Then, data from the third topic, regarding accounting and control practices, were examined in order to identify their potential role in the different logics operating in Liquidweb. In so doing, we identified two main accounting and control practices at work within the company (described in Section 6). The first is an agile-based control system used to manage all projects. The second is the business planning system implemented for BrainControl projects. By focussing on these two practices, we were able to classify all data from topic 3 into two sub-groups: data about the business planning system (mainly obtained from the company's internal reports and interviews), and data regarding the agile-based control system (mainly obtained from the company's spreadsheets and interviews). The first set of data was then analysed by identifying key events (Van de Ven and Huber, 1990) and ordering these events chronologically. In particular, we identified the following key events: (1) preparation of the first version of the business plan in 2011; (2) preparation of the second version of the business plan in 2012; and (3) preparation of the third version of the business plan in 2013. We ordered all empirical material chronologically around these three events to reconstruct the development of the business plan for BrainControl, while also illustrating its ongoing engagement with the company's stakeholders (and their respective logic) within this evolution.

As for the agile-based control system, we analysed the main projects reported in the company's spreadsheets during the research period and we combined these data with the information gathered through the interviews, as well as with the details of the various versions of the business plan. Thereby, we contrasted how different accounting and control practices addressed the social and commercial logics simultaneously within Liquidweb. We also analysed how the tensions between logics unfolded through different events by depicting 'who did what, and when' (Maguire, 2004, p. 115). The results of this analysis are reported in Section 7.

As a final step in the data analysis, we have built on the literature reviewed in Section 3 to explore the mediating role of accounting, and to discuss the complex interconnections between agile-based control practices, business planning and stakeholders' interests and concerns (see Section 8).

5. Liquidweb as a hybrid organization: the different interests and multiple logics at work

As seen in other social enterprises (see Battilana and Lee, 2014), Liquidweb is embedded into two main institutional logics that are different and often conflicting (Reay et al., 2009). To achieve

its social mission, Liquidweb has to provide advanced and innovative solutions to meet patients' needs. The R&D of advanced versions of BrainControl requires the active involvement of healthcare institutions and medical consultants that mediate Liquidweb's relationships with patients and their families, and help in the testing, verifying, validating, or modifying of the prototype of the product. This group of interested parties encourages Liquidweb to concentrate on R&D processes for BrainControl that will eventually meet more complex patient needs, to the advantage of the *social logic* in place. This logic is also shared by social agencies and non-profit associations providing grants for the R&D of BrainControl.

Despite the grants received from the social welfare sphere, BrainControl "is not recovering the cost of its continuous development process, as yet" (the founder). Therefore, in order to secure its financial sustainability, Liquidweb relies on customers in the commercial business area (the majority are private companies). These customers are embedded in a *commercial* logic that is shaped by the ultimate goal of generating revenues and maximising the outcome of R&D. As emphasized by the founder:

> "The customer of our commercial projects do not realize that we are working on other projects. They want the best outcome from their projects, in the short term".

> Potential financial investors also share the commercial logic. As highlighted by the founder, "Although they are interested in BrainControl, they are focussed on any immediate high return from the basic version of BrainControl, which is currently available for sale".

On the one hand, the social logic, which is shared with local healthcare institutions, local non-profit funding agencies and patients, requires the company's resources to be focused on the R&D of the more advanced and innovative versions of BrainControl, to the advantage of patients' needs. On the other hand, the commercial logic calls for resources to be allocated for the commercialization and sales of the available, basic version of BrainControl (as requested by potential financial investors), and to carry out profitable projects for customers in the commercial business area as well. However, as we shall see, despite the ongoing pressures from the social and the commercial logics, neither of the two ever becomes dominant within Liquidweb since the hybrid nature is sustained over time through the persistence of the conflict between the different logics that are at work.

6. Accounting and control practices at Liquidweb

As illustrated above, Liquidweb manages all R&D activities for private customers and for patients through projects. In this context, to support the planning and control of each individual project (including BrainControl) and the management of the project portfolio, the company has adopted an agile-based control system, that is, a computer-based control system relying on the key principles of agile project management. In particular, the founder decided to adopt 'Scrum', a widely diffused, agile software development approach.

Agile methodologies comprise a broad set of techniques that are highly adopted in the field of project management and software development. In contrast to 'traditional' approaches to project management, agile project management techniques give prominence to people and iteration rather than processes and tools; working software rather than exhaustive documentation; customer collaboration rather than contract negotiation; responding to change rather than following plans[8]. Scrum is an agile software development technique which organizes development into cycles, referred

[8] See www.agilealliance.org

to as 'sprints', with the aim of offering precise opportunities for engagement with the customer, while ensuring that project requirements are accomplished (see Schwaber, 2004)[9].

Within Liquidweb, this approach is used for project planning and control purposes. In particular, each project is planned and controlled in an iterative manner and with the constant engagement of the customer. In the planning phase, each project is organised into groups of planned tasks that are recorded on a computer-based spreadsheet that was developed by the founder (an example is shown in Figure 3). The project portfolio spreadsheet can be accessed at any time by all Liquidweb employees, who are required to start their daily activities by working on the tasks with higher priority. In addition, as soon as they have started and/or finished performing the tasks, they need to update the status of the tasks on the spreadsheet with notes on eventual variations from the plan. Each sprint must be performed in four weeks.

At the end of each sprint, actual results are discussed with the customer, and all subsequent sprints can be re-planned on the basis of the customer's feedback. Interestingly, throughout this four-week period of planning and feedback, the agile-based control system is used to allocate (or reallocate) resources quickly across projects and across the entire portfolio according to the outcome of R&D processes and the customers' feedback.

This system is used for both the private customers' projects (in the commercial business areas) and the BrainControl projects. As illustrated by employee 3:

> "we give the same attention and care to all types of projects. We use the same agile methodology for all of them. However, for BrainControl projects, there is also a special human aspect involved. You feel that this product is going to affect how severely disabled people might live. It feels different than, for example, a project to develop a website for a customer. We care about all of our projects, but we feel different kinds of responsibilities. So we keep BrainControl projects in mind at all times, even when we are developing a website".

Figure 3 – A snapshot of the spreadsheet for agile-based control in Liquidweb

Priority	Project title	Status	team member	Direct Labour hours	Start	Stop	Day of feedback	Task description	Notes
		Closed							
		Open							
		Open							
		upcoming							
		upcoming							
		upcoming							
		upcoming							
		upcoming							
		upcoming							

Source: adapted from the company's materials

In addition to the agile-based control system, Liquidweb relies on a four-year business plan for the planning and control of activities and resources dedicated to BrainControl, spanning from R&D to production and sales. Projects for customers in the commercial business area are not included in the business plan, which focusses on the various versions of BrainControl. As explained by employee 1,

> "While the business plan gives us guidelines that we have to follow and shows us the way ahead, the agile-based control system offers us an idea about how quickly and effectively this way ahead can be actually pursued, or whether slight deviations to the plan are needed."

[9] See also www.scrumalliance.com.

As we will see next, since the founding of Liquidweb, three main versions of the business plan for BrainControl have been developed.

7. Accounting, mediation and unfolding innovation

Similar to many hybrid organizations, Liquidweb is characterised by the need to constantly incorporate elements from different institutional logics – social and commercial, in this case – and, therefore, to deal with the competing demands that arise as the company attempts to fulfill its mission (Battilana and Dorado, 2010). In this context, accounting and control practices do not couple with the interests of any specific logic. Rather, as we will discuss in the following subsections, they unfold to enable different groups to take care of their own interests, while *mediating* these interests throughout the innovation process.

7.1. The first version of the business plan and the agile-based control system

In 2010 Liquidweb developed the first version of the business plan for BrainControl. This version was used to engage with local non-profit agencies and local healthcare institutions that share the social ambitions of BrainControl. As explained by the founder:

> "Our first business plan was very cautious. We mainly considered the perspectives of local healthcare institutions and local patients. We preferred to stay local and to try to advance our research to offer new services and facilities to patients as much as possible".

Facing pressures from local healthcare institutions, the targeted revenues reported in the first version of the business plan were relatively low for the first two years as Liquidweb decided to put a hold on any plans for growth in terms of commercialization and sales, in order to focus the available resources on the development of applications for local patients in the social sector. Then, the planned revenues increased progressively, reaching 2.5 and 3.5 million euros in the third and fourth years, respectively. The main reason for these cautious forecasts was the need to concentrate more on R&D activities for the highly advanced versions of BrainControl (see Figure 2), in order to develop prototypes and to address the more complex patients' needs directly.

The presentation of the first version of the business plan, together with the demonstration of BrainControl prototypes, enabled Liquidweb to engage in conversations with local healthcare institutions, which could see that their social interests (i.e. the patients' specific needs) were taken care of in the plan.

Simultaneously, customers in the commercial business areas could personally check that their interests were being taken care of, through the implementation of the agile-based control system. The customers had access to the system, they could check costs and processes efficiency, as well as the technical outcome of each sprint, and they could suggest further adjustments to the innovation process for the upcoming sprints.

Whereas the first version of the business plan was used to engage with local healthcare institutions and to ensure them that their social interests were taken care of, the agile-based control system allowed the private customers to take care of their own commercial interests as the R&D of the various projects continued. However, since the number of projects for private customers was high, the employees experienced difficulties in managing the growing complexity caused by the simultaneous needs of following the business plan and utilizing resources according to the agile-based control system.

An example of this struggle between competing objectives is provided by a project that Liquidweb developed for a company (referred to as 'Alfa') in 2011. For project Alfa, Liquidweb was

asked to develop a high-tech software solution for the customer's fruit-pitting machines (i.e. machines that remove the pits from fruit automatically). In order to do the job, and achieve a high level of customer satisfaction, Liquidweb decided to implement technologies for imaginative movement to arrive at the design for the fruit-pitting machines. In this context, and with the resource allocation process managed by the agile-based control system, high priority was given to project Alfa. Following the Scrum approach, tasks and sprints were agreed on with the customer and targeted revenues were linked to the technical outcome of the solution that was to be developed. For the initial sprints a significant number of working hours were allocated to the project, to be sure that customer satisfaction and commercial targets were achieved. At that time, the spreadsheet reported 39 projects with different priorities (ranging from 1 to 10)[10]. Project Alfa had a high priority of 3.

Despite the high priority of the project, the employees did not stop their thinking and work on technologies for the healthcare sectors and BrainControl, as indicated by the business plan. As explained by employee 3:

> "We are forced to think about several projects simultaneously, according to the agile system and our plan. This helps us to keep our minds open, without narrowing down our attention to only one specific idea or problem."

After the initial sprints, Project Alfa did not achieve the desired outcome. The technical efficiency in fruit-pitting was 82% in comparison to the targeted 87%. As confirmed by the founder:

> "We had to find a better idea for the project in order to achieve our financial target, but we were also receiving further requests from healthcare institutions to satisfy patients' needs. We had to be credible and stick to our business plan, but at the same time we had to satisfy our customer for this important project [Alfa]. We were struggling between all these requests because we had to work hard to keep all the different needs and aims in mind".

As they were struggling between the agile-based control system (for project Alfa) and the business plan (for BrainControl), the founder and the employees came up with a new algorithm for visual technologies that could work well for both. Indeed, the new algorithm allowed team members to achieve a technical efficiency of almost 100% for project Alfa. As team members were working on the fruit-pitting machine they thought that the algorithm could be useful in the healthcare sector too, to develop an interface for transmitting information about a patient's glycaemia to their doctor in real time.

While they attempted to stick to both the business plan (that embodied the patients' needs) and the agile-based control system (to satisfy the private customer and achieve the targeted financial performance), neither the social nor the commercial logic prevailed. Rather, the two accounting and control practices allowed both logics to persist. The different groups involved could see that their own (social or commercial) logic was accomplished through either the agile-based control system (in which the customer of project Alfa could verify the fulfilment of tasks and targets) or the business plan (which reassured local healthcare institutions about Liquidweb's commitment to the healthcare sector).

Instead of facilitating only one logic, (such as sacrificing the patients' needs in order to meet the customer's needs, or the opposite), the two accounting and control practices informed and gave direction to the R&D process by creating a space where creative thinking was stimulated for the benefit of both projects simultaneously. Therefore, the interests of the various parties involved were not reduced to achieve a compromise, but, instead, they were *mediated* through the unfolding of the innovation process.

[10] 1 was the highest priority and 10 the lowest.

7.2 The second version of the business plan for BrainControl and the agile-based control system

Although the first version of the business plan would have enabled Liquidweb to meet some of the social needs of local patients, it comprised a limited growth in terms of market share and profitability. Aiming to find a partner to support the BrainControl projects financially in order to avoid dependency on the limited revenues from the commercial business area, the founder intensified interactions with potential financial investors and started to look for venture capitalists. With this objective in mind, in 2012 he visited Silicon Valley in the U.S.A.

The discussion of the business plan with venture capitalists helped the founder to rethink the commercial strategy for BrainControl in order to incorporate the perspective of potential investors. As claimed by the founder:

> "My trip to Silicon Valley was enlightening. When I went to Silicon Valley to look for potential investors in BrainControl, I learned that if you want to be considered by venture capitalists you cannot present a business plan for 3.5 million over four years; you need to plan 30 million over four years".

Therefore, taking into account the perspective of potential investors (and their desire for commercial performance), Liquidweb prepared a second version of the business plan. In this occasion the founder decided to focus the first two years of the business plan on R&D for BrainControl (which would have to be sold mainly in the local market with revenues below one million euros for this period), and then planned commercialisation in the global market for the third and fourth year. Targeted revenues for the third year equalled 8 million euros and reached 28 million in the fourth year.

Thus, the second version of the business plan addressed the concerns coming from potential financial investors who shared the commercial logic. It accomplished this by progressively allocating more time and resources for the commercialisation and sales of the first version of BrainControl in a broader market. In this context, the tensions between the different logics were still present. As explained by the founder:

> "the risk was to focus too much on getting financial results and too little on R&D for patients".

Whereas potential financial investors saw their interests satisfied in the second version of the business plan, the simultaneous functioning of the agile-based control system prevented the commercial logic from becoming dominant. In fact, as employees had to re-think and re-plan the R&D tasks and activities for BrainControl within the agile-based control system, new social needs emerged. Indeed, the founder and employees realised that by producing and selling BrainControl to a large number of patients, they could not ensure one-to-one assistance and training for all the families involved. As a consequence, the agile-based control system brought social needs back to the forefront and forced employees to explore technical solutions for assisting families and patients at a distance on a large scale. As argued by employee 3:

> "We could not just plan tasks for production. We had to ensure a one-to-one assistance for patients and their families even in the large market featured in the business plan".

As employees had to make sense of the social and commercial logics in practice, creativity for the development of distance training technology was stimulated. These technologies would have favoured training at a distance, as well as new functions for the headset, such as software updates and remote assistance through the web.

Consequently, the format of the agile-based control spreadsheet was further developed. In particular, the spreadsheets for all BrainControl projects needed to include a specific list of tasks for planning *ad hoc* distance training and assistance to patients. An example of the new spreadsheet for distance training is provided in Figure 4. As stated by the founder:

> "the new spreadsheet plays a crucial role for us, because it helps us to ensure that we all follow the same tasks for all patients and that we engage with them properly, regardless of where they live."

This view was reinforced by employee 7, who added:

> "Many ideas for BrainControl come directly from our patients' feedback when they first try BrainControl. We keep track of patients' experience on the spreadsheet and reflect on it so that we can adjust subsequent tasks and adapt BrainControl to the benefit of other patients too."

Figure 4 – A snapshot of the spreadsheet for the agile-based control of distance training

Training Task	Patient's name and conditions	Status	team member	Dlirect Labour hours	Start	Stop	Feedback	Videos and software	Notes
Preparation		Closed							
Sensors initiation		Open							
WiFi connection		Open							
Demonstration		upcoming							
Trial		upcoming							
Recording		upcoming							
.....		upcoming							

Source: adapted from the company's materials

Whereas the first version of the business plan (illustrated in sub-section 7.1) allowed healthcare institutions to take care of their social interests and the agile-based control system allowed private customers to take care of their commercial logic (as in the situation of project Alfa), above all, the two accounting and control practices unfolded to accommodate the evolving relationships with the different groups of interest. In particular, as the tensions between the social and commercial logics evolved and new parties (i.e. the potential financial investors) began to engage with Liquidweb, the business plan evolved from the first to the second version to accommodate the commercial aspirations of potential financial investors by targeting revenues of 28 million euro (instead of 3.5 million, included in the first version of the business plan) and through commercialization and sales in a larger market. Simultaneously, the use of the agile-based control system favored patients' social needs by placing them at the forefront and by enabling the development of distance training technologies for engaging with patients as part of the R&D process for BrainControl.

Accounting and control practices were shifting between the two logics, and therefore they were not attached to any of them. The different interests at stake were not reduced in order to achieve a compromise, nor were they combined in search for reconciliation. Rather, the two logics were sustained simultaneously and over time. Again, conflicts between logics were not eliminated. Rather, they persisted as they were *mediated* by accounting and control practices, which unfolded to accommodate the tensions between logics and give direction to the innovation process.

Nevertheless, a new version of the business plan was about to be developed.

7.3 The third version of the business plan for BrainControl and the agile-based control system

As the founder and employees were working on R&D activities for distance training technologies according to the tasks that had been re-planned within the agile-based control system, they soon realised that the new technologies being explored would allow them to serve a larger number of patients compared to the number of patients that they originally estimated in the second version of the business plan. This led to a third version of the business plan in 2013. In the 2013 version, thanks to the new distance training technologies, revenue forecasts were equal to eleven million dollars in the third year and almost 40 million dollars in the fourth year.

Despite the founder's ongoing efforts to engage with financial investors through the business plan and the various offers received from venture capitalists, he ultimately did not accept their offer. Drawing on the agile-based control system, the founder and the employees could monitor the revenues coming in from private customers in the commercial sector and to re-allocate activities over the projects for the R&D of BrainControl prototypes, without having to rely on financial investors in the short term. As stated by employee 1:

> "we have a good project portfolio in our agile spreadsheet. When we come to the end of the projects we earn the revenues. The successful outcome of the projects in the agile system means that we have the financial resources to carry on our research and testing of BrainControl on our own".

Although the business plan was initially designed with the financial investors' commercial logic in mind, this logic did not become dominant. Instead, the 2013 business plan was adapted to provide an opportunity for engagement with non-profit agencies. As a result, a new section, 'Social impact assessment', was included in the document and permitted the company to provide visibility for the social value produced by BrainControl. This section reports the estimated Social Return on Investment for BrainControl and includes a description of the perceived benefits for patients[11]. Therefore, the business plan was adapted to enable Liquidweb to engage in conversations with non-profit agencies. Interestingly, when the new business plan was presented to non-profit agencies in Milan, Liquidweb was awarded grants in support of its projects. As explained by the founder:

> "Imagine that you are a prisoner inside your own body, unable to control your arms, your legs, your head. Imagine that you wake up in the morning and are unable to turn on the light. Imagine that you cannot speak or communicate your feelings or needs to your wife, your children or your friends. Many people cannot do these things."

According to the founder, this was something that needed to be clearly indicated in the 2013 business plan when searching for funding. However, the grants that were received were not sufficient to financially sustain the ambitious business plan and, therefore, the search for financial investors continues.

8. Accounting and the ecology of objects

In the previous sections we have analyzed how accounting and control practices – the business plan and the agile-based control system – unfold to inform the innovation process within Liquidweb while also sustaining the multiple projects, aspirations and ideas that characterize company's journey so far. Throughout this journey, the different interests at stake were not reduced in order to achieve a compromise, nor were they combined in search for reconciliation. Rather, they were *mediated* by accounting and control practices. These practices did so by establishing complex interconnections

[11] Explaining the method used by Liquidweb to calculate the Social Return on Investment (SROI) of BrainControl goes beyond the scope of this paper. As mentioned in the 2013 business plan and confirmed by the founder, Liquidweb followed the guidelines provided by the SROI network, "A Guide to Social Return on Investment" (p. 47), January 2012.

with different parties, each of which could take care of its specific logic, thereby sustaining their diversity. Next, we discuss how this happens in practice within Liquidweb.

8.1. Accounting and control practices as boundary objects

As seen in other hybrid companies (Battilana and Lee, 2014), within Liquidweb there are multiple concerns, views and interests at stake that persistently affect the underlying intentions of the company's stakeholders, and that determine their participation in the company's journey. As the development of BrainControl unfolds, the trials of the prototypes, the patients' improved quality of life, the financial sustainability of the projects, the complexity of production, the quality standards, the development of other projects in the portfolio and the retention of ownership are only a few examples of the possible interests and concerns that are affected by the relationships with the multiple parties involved.

Throughout this journey, practices such as the business plan and the agile-based control system become relevant, not only because of the content they contain, but also due to the actions they facilitate (Busco and Quattrone, 2015). In particular, within Liquidweb, they provide users with ways of defining and establishing logical connections between their own individual concerns – such as the trials of the prototypes, the financial sustainability of BrainControl's various versions, or the development of the technology – and the ends, means and constraints of the organization. In so doing, accounting and control practices have acted as boundary objects (Star and Greismer, 1989; Star, 2010) that contribute to the construction of a space in which various internal and external stakeholders have engaged with, and connected to, the company's social and commercial logic, as well as to the available resources and unavoidable constrains present in Liquidweb.

For example, at the end of each sprint, the customer of project Alfa could check the R&D outcome of the project. The discussions with the customer on the upcoming sprints were rooted around the agile-based control system. These conversations steered the innovation process, by supporting the customer's engagement with his object of concern (i.e. the technical efficiency in fruit-pitting). As argued by the founder:

> "customers have an almost real-time update about our progress on the project. Employees update the agile-based control system every day, uploading information about the tasks they closed, the tasks left open and why. Because of this, the customers get constantly involved with the project and start asking 'why didn't you do this?' and 'why did you do that?'"

Simultaneously, the business plan was attracting different parties (e.g. potential financial investors and non-profit agencies), and engaging them in conversations with the founder and employees on the level of sales for BrainControl and on R&D activities. For example, when the founder visited the Silicon Valley in 2012, the business plan was the main object of discussion with potential financial investors. As described by the founder:

> "they [potential financial investors] asked me to present the business plan in a pitch, which means in a few slides. In particular, the revenues and profitability. When I presented the pitch, they told me that revenues had to be almost ten times more if I wanted to carry on my conversation with them. So I went back to my hotel and worked all night on revising my projections and ambitions".

Also, the third version of the business plan was adjusted to attract non-profit agencies by including a new section providing examples of patients' actual experience and the social benefits of BrainControl. As confirmed by employee 2:

> "This section appears towards the end of a 23-page document, but that doesn't mean that isn't important. It is crucial to make interested parties really understand that we do have a social impact with our technology".

In this context, the business plan and the agile-based control system acted as boundary objects by attracting different stakeholders and engaging them in an ongoing dialogue about their own objects of concern (such as, the technical efficiency in fruit-pitting for the customer of project Alfa; the financial projection for financial investors; and the social section for non-profit agencies). Accounting and control practices demonstrated a degree of flexibility as they could be adapted to the different audiences to which they were presented in the encounters that they configured (Doganova and Eyquem-Renault, 2009). For example, the business plan could be flexibly molded into either a pitch or a 23-page document for attracting different audiences. When it was presented by the founder at conferences or private meetings it was robust enough to capture the interest of potential venture capitalists by making BrainControl appear feasible in a pitch, and at the same time it was flexible enough to attract non-profit agencies into the conversation through its social section.

Meanwhile, the agile-based control system unfolded to sustain the development of *ad hoc* distance training technologies for specific patients' needs. In particular, the new agile-based spreadsheets (see Figure 4) sustained patients' engagement with the R&D process, by ensuring that *ad hoc* tasks were performed to provide a personalized training and to collect feedback about the patients' first experience with the product, which could also inform further product development ["We keep track of patients' experience on the spreadsheet and reflect on it so that we can adjust subsequent tasks and adapt BrainControl to the benefit of other patients too" – employee 7, as quoted above]

The conversations generated and maintained through the two accounting and control practices produced neither decoupling, consensus nor compromise. Instead, they contributed to the construction of a collective space in which different concerns could be voiced. The business plan and the agile-based control system, therefore, did not reduce diversity and variety; rather, they have acted as boundary objects by attracting multiple interests and expectations and establishing complex interconnections with them (and hence with the company's social and commercial logic).

In so doing, as we explain next, accounting and control practices were not the only objects at work, as they attracted other objects into the conversation with the multiple stakeholders in place.

8.2. Ecology of objects at work

The first four years of operations at Liquidweb represent a journey in which innovation has been sought after through a recursive collective experience in which intensions, aspirations and concerns have been mediated through an ecology of objects at work (see Nicolini *et al.*, 2012). The technologies underpinning the various versions of BrainControl, the actual prototypes, the distance training technologies, the new algorithm for the fruit-pitting machine, etc., were all objects dragged into the conversations to problematize the content of innovation (in technical terms or in terms of achieving a larger market, for example) and engage all stakeholders in an open dialogue.

For example, one of the initial sections of Liquidweb's 2013 business plan includes the technical description of the BrainControl headset, of the disability being addressed, as well as a web link to videos about patients' use of the headset and the functioning of prototypes. In a similar vein, the slide presentations of the second version of the business plan were accompanied by videos demonstrating the use of the technologies by patients. Whereas it was the boundary role of the business plan that dragged Braincontrol's prototypes into the conversation with multiple interested parties, it was the prototype, and the demonstration of its functioning, that became a matter of concern

for the diverse stakeholders in place. The release of prototypes and the testing with the patients both represent important milestones in the process of innovation that Liquidweb shares with its external stakeholders when presenting the business plan. As suggested by employee 1:

> "Healthcare institutions and investors are interested in our business plan. But, to be honest, they want to see our prototypes first. So, we show them videos showing the patients using the headset. This is very important so that investors can be fully aware of the features of BrainControl as they see patients move things with the power of their brain. They need to see it with their own eyes".

For example, when the first version of the business plan was presented to potential financial partners, the founder started his presentation by wearing the headset himself and showing the use of BrainControl technology to drive a flying saucer with his mind. As argued by employee 2,

> "what leaves them [interested parties] speechless is seeing our prototype at work"

Following these presentations, Liquidweb boosted the number of partnerships and increased the number of grants that were received.

In addition, whereas it was the new version of the agile spreadsheet that sustained the development of *ad hoc* tasks for distance training and guided patients' involvement in the R&D process, it was the actual trial of the product by the patients and their families that stimulated further adjustments and innovation for the benefit of patients ["Many ideas for BrainControl come directly from our patients' feedback, when they first try BrainControl" – employee 7, as quoted above].

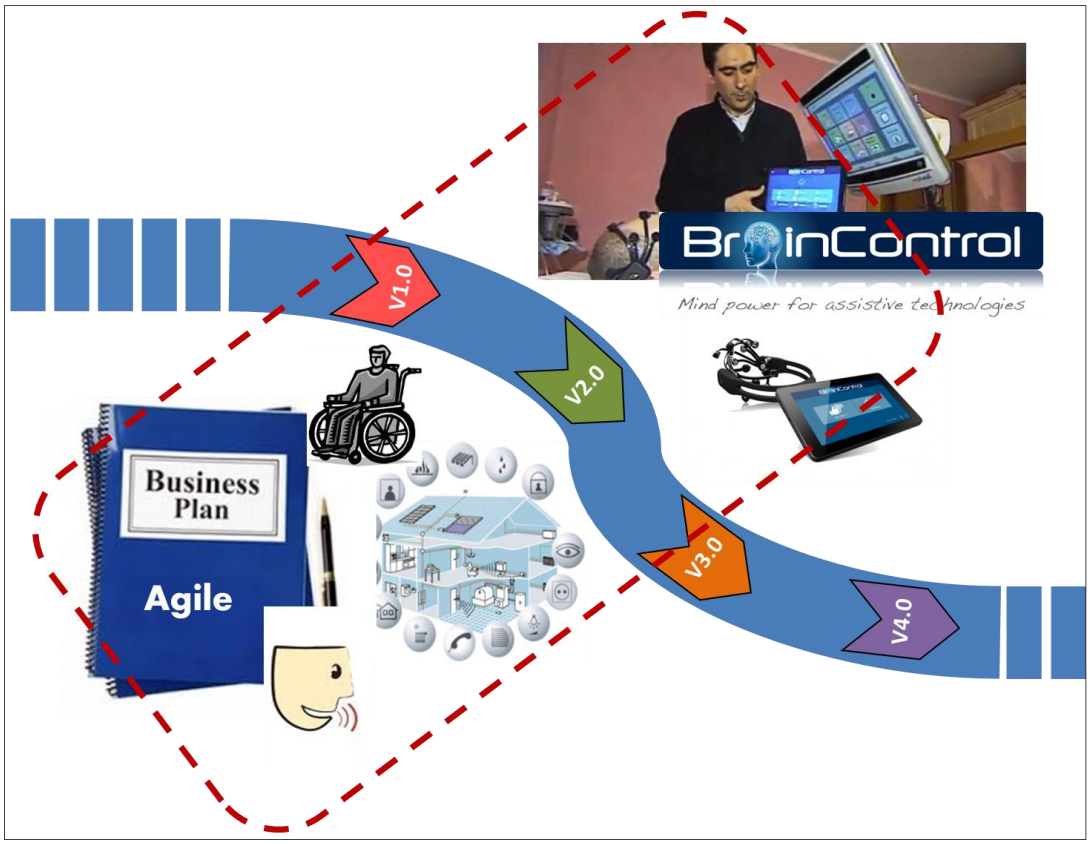
Far from representing complete solutions for satisfying stakeholders' needs and expectations, these objects (such as BrainControl prototypes and technology) retain an intrinsic epistemic nature (Knorr Cetina, 1997) as they stimulate further ideas and actions because of their incompleteness. For example, it was impossible for BrainControl to be sold in large markets (according to a commercial logic), while at the same time offering one-to-one social assistance to all patients. This impossibility – which was highlighted by the agile-based control system – stimulated a much needed innovation in terms of distance training technology. In addition, it was the impossibility of finding an immediate solution for the fruit-pitting problem that stimulated further research from employees, pushing them to develop a new algorithm that was useful, not only for this specific project, but also for the glycaemia reader.

In this context, objects such as BrainControl or the technology for fruit-pitting stimulated innovation *because of* their incompleteness, and therefore engaged users through their epistemic nature and the knowledge that they generated. Still, it was the boundary role of accounting and control practices that dragged these objects into conversation, allowing different stakeholders to connect their own logics to these objects, while maintaining their diverse perspectives.

Overall, an 'ecology of objects' (Nicolini *et al.*, 2012) at work in Liquidweb contributed to make innovation happen by "materializing" it and allowing it to be presented in conversations to an heterogeneous audience (see Figure 5). This had significant implications in the development of the innovation as each presentation or meeting could potentially lead to changes in the technology or to Liquidweb's relationships with stakeholders.

Therefore, accounting and control practices, together with the other objects at work, participated in a continuous re-definition and questioning of what counts as 'innovation'. This processes of re-definition and questioning has been performed throughout a journey that Liquidweb has embraced across the globe since 2010; a collective experience in which meanings, interests and concerns have been constantly mediated and the social and commercial logics have persisted overtime thanks to the continuous unfolding of the ecology of objects at work.

Figure 5 – Sustaining multiple logics and innovation in hybrids: an ecology of objects at work



Source: the Authors' elaboration from field material

9. Conclusions

This paper has explored how accounting and control practices contribute to the persistence of multiple institutional logics (social and commercial in the case of Liquidweb) that characterise the functioning of hybrid organizations and underpin their processes of innovation. In so doing, we offer a twofold contribution.

Firstly, whereas the literature on hybrid organizations has mainly explored the mechanisms for managing the intrinsic pluralism of hybrids by keeping the multiple logics separate or by reconciling them through compromise or combination (Battilana and Lee, 2014; Pache and Santos, 2013), in this paper we add to the existing studies by showing that conflicts between these logics do not need to be reduced or reconciled but, instead, can be mediated to generate innovation through accounting and control practices. Although compromising solutions may fail in the long run, primarily because of the dissatisfaction and power struggle between different groups of interest, mediating mechanisms enable different groups to find their own way of realizing their interests through evolving conditions, without having to compromise with other groups. As a result, diversity is channelled through mediation into unfolding innovations.

In the case of Liquidweb, the business plan and the agile-based control system did not serve any specific logic but rather locked different parties to their own logic by offering a space within which these parties could pursue their own interests, while maintaining their diversity. In this space, new solutions emerged and were channelled into innovation processes through the simultaneous functioning of the two accounting and control practices. Through their mediating role, the persistence

of the hybrid nature of the organization was sustained without reconciling different logics or keeping them separate, but by allowing their diversity to co-exist and generate innovation.

Secondly, building on the literature on accounting in action, we illustrate how accounting and control practices can act as boundary objects for engaging the multiple parties that participate in the process of innovation. Importantly, while sustaining conversations on different practical concerns, these practices contributed to generate interest and motivation towards an ecology of objects at work. These objects helped to materialize innovation and made it presentable to a heterogeneous audience, while reinforcing the engaging role of accounting and control.

Far from offering complete solutions, objects such as BrainControl prototypes and evolving technologies represented epistemic objects that allowed innovation to unfold by fuelling different parties' interest and engagement through their openness and incompleteness. Whereas previous studies have acknowledged the role of accounting practices as boundary objects, this paper adds to the existing accounting literature by shedding light on the broader ecology of objects that accounting practices engage with as they perform their mediating role.

Finally, our paper suggests a possible way to respond to a recent call for further research regarding the suitability of traditional management accounting practices in addressing multiple interests and objectives (Contrafatto and Burns, 2013). In particular, our findings imply that, rather than trying to extend the contents of accounting and control practices to incorporate and accommodate multiple perspectives, we should further research how these practices (together with the objects they engage with) succeed in attracting the multiplicity of concerns and the different points of view that surround accounting.

The empirical evidence presented and discussed in this study refers to a small company. However, the findings of our paper can be extended to project teams in large social enterprises that need to accomplish both social and commercial objectives when attempting to reach a larger market with limited resources. Also, our findings confirm previous studies on the complexity involved in the relationship between entrepreneurs and venture capitalists within innovative startups, and suggest opportunities for further exploring the role of accounting within such complex relationships in light of the different logics involved. Finally, in larger social enterprises other mechanisms (such as the influence of the Government) may play a role, along with accounting and control practices, in sustaining the hybrid nature of an organization. In this context, our paper proposes ideas to further research the role of the ecology of objects during processes of innovation within hybrid organizations.

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Appendix A – Interviews and direct observation, key informants, and main topics

Informant	**Main topic**			**N. of interviews**
	Background of the company and key strategies	*R&D processes*	*Accounting and control practices*	
Founder	3	7	7	**17**
Employee 1			7	**7**
Employee 2			5	**5**
Employee 3		1	2	**3**
Employee 4		1	1	**2**
Employee 5		1	1	**2**
Employee 6			1	**1**
Employee 7		1		**1**
Total Interviews	3	11	24	**38**