Couchsurfing with Bateson: An ecology of digital platforms

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Abstract

Digital platforms radically alter socio-economic and organizational patterns. In an ecological sense, they enable the rapid extension of tolerance limits by digitally scaling variables such as the availability of accommodation or labour. However, such maximization of specific variables in a complex ecology bears the danger of pathological runaway patterns. In our paper we draw on the work of Gregory Bateson to outline an analytical approach for the study of digital platforms as ecological phenomena, focussing on the effects of digitalization on the context in which platforms operate. To study such meta-patterns, we elaborate three interrelated concepts: stress, adaptation and budgets of flexibility. We exemplify these ideas through a longitudinal study of the early digital platform Couchsurfing and develop implications for our understanding of technology and organization.

Keywords

Ecology, ecosystem, digital platform, technology, Bateson, Couchsurfing

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Digital platforms in organization studies

Digital platforms are upsetting the systemic balances and dynamics of contemporary society. Fanned by investment hypes and leveraged by world-wide networks, they grow and expand by rapidly scaling the availability of information (Google), accommodation (Airbnb), labour (Uber), or goods (Amazon) and so push the limits of growth with freakish speed (Meadows et al. 2004). In this way, digital platforms help subsume what was hitherto private or natural into the abstract rules of economy and data-based computation (Dupuy, 2014; Alaimo & Kallinikos, 2020; Zuboff, 2019). Digital platforms can accelerate the recursive patterns of interaction between organization and environment far beyond the capacities of mechanical or analogue technology, bringing about rapid changes in their wider ecosystem (Beverungen et al., 2015; Márton & Mariátegui, 2015). Drawing on the ecological thinking of Gregory Bateson (1972), we empirically analyse such a change of pattern, demonstrating how digital platforms can facilitate potentially pathological runaway dynamics by rapidly maximizing small numbers of variables of an otherwise complex ecological system.

In organization studies, digital platforms are frequently conceptualized as a new organizational form that cannot be clearly demarcated from its environment (Schreyögg & Sydow, 2010; Hemetsberger & Reinhardt, 2009; Gawer, 2014; Ciborra, 1996). Open collaboration platforms, such as Wikipedia, draw on contributors who are not formal organizational members (Aaltonen & Lanzara, 2015; O'Mahony & Ferraro, 2007; Dobusch & Schoeneborn, 2015). In the same way, transaction platforms, such as Airbnb, make their users the purveyors of services and goods (Parker et al., 2016; Constantiou et al., 2017; Evans & Schmalensee, 2016; de Vaujany et al., 2020, Mikołajewska-Zając, 2018); while innovation platforms, such as the iPhone, involve outside

developers and modules to expand their products and services (Tiwana, 2014; Eaton et al., 2015; Yoo et al., 2010). More recently, platforms have been studied as parts of larger communities of organizational actors that coalesce and organize around a firm, product, or platform referred to as business or innovation ecosystems (Constantinides et al., 2018; Alaimo, 2021). Exemplified by Apple's iOS ecosystem, such setup offers competitive advantages, as it coordinates complementarities without vertical integration or strict hierarchical governance (Gawer & Henderson, 2007; Jacobides et al., 2018).

Digital platforms are perhaps the most obvious examples of a broader shift towards technological ecologies. Digital media produce new apparatuses and modes of life fundamentally at odds with older forms that locate meaning, sense and purpose in the achievement of particular ends, and conceptions of nature as guided by final ends, designs or ultimate purposes. Instead, we find a continuous restructuring of ends, geared mainly at the overcoming of limitations and limits: to live longer, do more, earn more, or build more, in an endless increase of growth, all the while becoming bereft of the capacity to ask what such growth is for (Nancy, 2013). This invokes fantasies of future states of singularity, in which the acceleration of technological change has provided solutions to all natural limits or, conversely, concerns about how human experience comes to meet the logic of electronic space, leaving the human self unable to find or make a home in technological ecologies, which complete the capitalist drive to exploit the earth and its inhabitants (Harries-Jones, 2016, p. 139; Stiegler, 2011; Vaccari, 2020). These scenarios emerge as digital machines differ from the machine arrays of industrial production. Arranged into networks, they are no longer confined to the execution of fixed instructions (Kallinikos et al.,

2013). Rather, in interacting with their environments, they include their relations with their environment into their own (open and universal) functioning (Simondon, 2012).

Acknowledging these philosophical and media-theoretical explorations, our paper pursues a narrower analytical focus, investigating how the patterns of an open (changing, transforming, continually switching) environment change through the proliferation of digital platforms. In this sense, we expand upon existing investigations about the ramifications of a technologized ecology, as digital platforms extend organization out into its external space, modifying the recursive patterns of interaction between organization and environment (Jarvenpaa & Lang, 2011; Beverungen et al., 2015; Márton & Mariátegui, 2015). Our specific research question relates to these processes of growth and intensification; how digital platforms are implicated in these processes; and how these (recursively) alter the very context in which they unfold.

We draw on the work of Gregory Bateson (1972) who played a central role in the cybernetic movement but exceeded core conventions of systems understood as being demarcated by boundaries. His interest lay in the patterns that connect across boundaries, approaching them as supplementary 'meta' layers in order to account for self-referentiality in communication (Ruesch & Bateson, 1951, p. 209). In so doing, Bateson proposed an *ecological* style of thinking – an epistemology, as he called it – focussing on 'patterns of patterns', connecting across biology, culture and cognition (Bateson, 1972, p. 510; 1979). For our purposes, we elaborate this ecological style of thinking for the organizational study of digital platforms with Bateson's concepts of *stress*, *adaptation* and '*budgets of flexibility'*. We aim to identify the processes of

acceleration – the changes in the patterns of change – in the interplay of runaway and adaptive processes.

Our empirical work comprises a longitudinal study of the co-evolution between Couchsurfing, one of the first digital hospitality platforms, and its environment. We demonstrate how digital platforms at first provide a successful adaptation to a particular demand, for example in rapidly scaling the availability of accommodation for travellers, while simultaneously creating new dependencies. This rapid scaling generates a pattern of mounting systemic stress, setting in gear pathological runaway patterns that deplete the potential of an ecosystem for future adaptations by reducing the flexibility in the relationship between platform and environment. Rapidly maximizing a small numbers of variables (such as accommodation, labour or capital) can therefore set in gear vicious patterns that have detrimental effects for an otherwise complex ecosystem (Bateson, 1972, p. 510).

Our paper seeks to contribute both to the organizational study of technologies such as digital platforms and to the literature on the ecological analyses of organizational phenomena more generally (e.g. Accard, 2019; Whiteman & Cooper, 2011). For the former, we argue that an ecological style of thinking, exemplified by Bateson's approach, offers valuable insights into the adaptations that afford the rapid growth but also the limits and dangers of platform-based solutions in terms of their overall ecological effects (Zuboff, 2019; Alaimo & Kallinikos, 2020). This expands upon existing accounts of digital platforms, which reach analytical limits when it comes to those transformations of a higher order, such as digitalization, that alter the entire context within which organizing unfolds (Gawer, 2014; Parker, et al., 2016; Tiwana, 2014). For the latter,

we suggest that conceptualizing organizational phenomena in ecological terms challenges long-held notions of organizational agency and evolution as well as highlights the limits of control and regulation (Márton, 2009; Meadows, 2008).

Bateson's 'ecology of mind'

Bateson's conceptual elaborations are far from being readily available for the study of organizations. Infrequently cited in organizations studies (e.g. Morgan, 1981; Zundel, 2014), his writings are at times obscure, roaming widely across scientific fields in his studies of tribes, alcoholism, mental health, family relations, dolphins, and much more, combining sources from the natural and social sciences, the arts, and religion. Typically associated with cybernetics (e.g. Hayles 1999, p. 51), he does not fit the conventional understanding of the label, as he was an advocate for a move from concepts of control, foundational for cybernetics, towards ecological relationality and recursiveness, forming what he called an ecology of ideas or 'mind' (Bateson 1972; 1979). Bateson's ecology is not 'made' of energy or matter but of information: 'a difference which makes a difference' (Bateson 1972, p. 315) connecting the broader ecosystem. His work gained influence beyond his most scholarly areas of anthropology and psychotherapy (Ivanovas, 2007; Kohn, 2013), ranging from McLuhan's (1964, see also Theall, 1988) media ecology and Luhmann's (1995) social systems theory to Deleuze and Guattari's (1977) 'Anti-Oedipus' and Guattari's (2000, p. 41-44) 'Three Ecologies' (see also Eede, 2019; Fuller, 2005; Shaw, 2015;) and beyond.

We are particularly interested in his approach to understanding patterns rather than things or, as Harries-Jones (2016: 222) put it, the 'algebra' of relations that underlie order in ecology. This

expressly does not mean we have to understand everything (and indeed this is an impossibility); neither is it necessary to impose the idea of a structure, design, or total end (Harries-Jones, 2016, p. 158). Bateson's ecological style of thinking emphasizes meta-patterns of change; that is, the ways in which patterns are themselves patterned so that even if, on one level, we are defeated by the sheer complexity of things happening, on other levels we can ask how patterns themselves are patterned and so draw ecological conclusions about the whole ecosystem from within (Bateson, 1972, p. 502; Harries-Jones, 2008, p. 162).

Bateson's first major scientific contribution outlined such a concept of meta-patterns, taking the form of escalating feedback leading to discord and strife. He called this 'schismogenesis', a 'progressive change in behaviour patterns in relationships' (Bateson, 1958, p. xvii). In organization research, Zundel, Holt and Cornelissen (2013), for example, analyse such schismogenetic patterns between rivalling drug gangs as well as with institutions such as the police in the TV series, *The Wire*, tracing not just how processes of intensification alter the wider ecological system, but also how individuals and organizations can become locked into such patterns, unable to either gain control or muster sufficient flexibility to alter the trajectory of these runaway relations.

Rather than looking for cause-effect relations, Bateson's aesthetic inquiry into patterns explicitly considers self-referentiality and the interplay of truth and meaning in changing contexts (Kaizen, 2008). In drawing a distinction between linguistic communication and non-verbal interactions, Bateson recognized a meta-communicative *supplement* by which any communication is always inscribed in another message and so part of a wider context. This indicates the form of the form;

a metacommunicative order of communication about communication (Ruesch & Bateson, 1951; Harries-Jones, 2016, p. 136). For example, the verbal act supplements the non-verbal in issuing negatives (e.g. saying this is 'not' an attack when raising an arm). The verbal makes up something that is missing in the non-verbal; it provides specifications of the *context* in which the gesture occurs. But the supplement can also take prominence and supplant what it originally merely appended. We may get caught up in the abstractions of language, as Bateson quipped, like going to a restaurant and eating the menu card instead of the meal. This process of supplanting changes the status of a technical element (e.g. language) from means to an end towards being meaning-giving itself. There are parallels here between Bateson's identification of the supplementary 'meta' in language and a wider conception of the supplementary role of technology which, emerging as a remedy for a lack in nature, undergoes its own development; generating its own expectations and demands from out of its own possibilities (Hörl, 2012; Nancy, 2013). The conceptual linkages from Bateson's early work on communication to these more recent considerations of the supplementary role of technology are scarcely explored (e.g. Mateus, 2015), but we argue that his ideas on *how to study* the patterns of this supplementary meta-communication are of interest when trying to understand how ecological systems in general are patterned and how these changing patterns also alter the context in which action and meaning occurs.

Viewed in this way, organization and environment are not separate forms but entwined through circularities in which human bodies, tools and organizations are continuous in reciprocal and recursive relationship (Cooper, 2007). As living systems are organized in such circuit structures, any adaptation that affects one part can set off corrections reverberating through an entire

ecosystem in complex ways (Kauffman, 2019, p. 94). Yet, precisely these holistic relations are obliterated whenever we believe 'that we have a power over the world around us by way of our technology' (Bateson, 1970, in Ray, 2007, p. 865). For Bateson, technology is associated with the amplification of what he refers to as 'conscious purpose' (Bateson, 1972, p. 411-447): the consideration of a small subset of factors while disregarding the totality of 'mind' and its many, multi-layered loops and connections. Technology offers shortcuts through a complex set of connections to achieve goals, but it 'pulls out, from the total mind, sequences which do not have the loop structure which is characteristic of the whole systemic structure' (Bateson, 1972, p. 434); a narrowing of sight to one-dimensional, unilateral, and linear chains of means and ends, such as the bracketing of issues into 'problems' and 'solutions' (Luhmann, 1991; Ivanovas 2007, p. 848; Eede 2019, p. 65).

Applying technological solutions to systemic structures often results in a truncation of the wider patterns that connect and, however important and indispensable such interventions may be, they lack systemic wisdom (Bateson & Bateson, 1987, p. 26; Eede, 2019, p. 64-71). Any organism or society that is ignorant of wider patterns may come to rely for its continued growth on the depletion of its environment. In addition to biological influences, these ideas resonate with Whitehead's (1978, p. 100) outline of structured and unstructured societies and their respective environmental relations, but Bateson does not make these links explicit. Instead, he demonstrated such ecological pathologies empirically, for example via studies of alcoholics who, in order to deal with life's pressures, become dependent on increasing quantities of drink; or societies which become similarly 'addicted' to growing doses of pesticides to feed expanding populations, showing how accelerating relational patterns can become irreversible, long before

this is felt in terms of energy and substance, i.e. long before all lakes are poisoned, or the drinker's liver gives in. To apply these ideas to the study of digital platforms we subsequently extract and elaborate three analytical concepts from Bateson's work. For the remainder of the paper, we will use the term 'ecology' to denote Bateson's conceptual approach to understanding phenomena by focussing on meta-patterns, emphasizing the qualities and dynamics of the whole over those of individual parts. With the term 'ecosystem', by contrast, we will refer to the whole unit of organization-plus-environment, connected by patterns of communicative interaction and information exchange.

Stress, adaptations, budgets of flexibility

Following Bateson, we attempt to understand ecological patterns in informational rather than mechanical terms. *Stress*, *adaptation* and *budgets of flexibility* are ways of addressing not just how ecosystemic elements change in relation to new demands, but how on a higher level the patterns of these changes themselves change.

Stress

Individuals and organizations continually change when responding to altered settings and needs. Much of this happens within acceptable tolerance levels (e.g., in terms of particular variables such as resources, competence, strength, comfort, etc.). But when these levels are too regularly breached, and normal, habitual, affordable or pain-free ways of reacting are no longer sufficient, more profound changes are required. *Stress* denotes the condition where 'the external environment or internal sickness makes excessive or contradictory demands on an organism's ability to *adjust*' (Bateson, 1979, p. 230, our emphasis). Stress is particularly prevalent where

tolerance levels are breached and the capacity for adjustment of patterns is limited, for example in runaway, schismogenetic escalations: In the case of the alcoholic, the more pressure in life, the more reliance on alcohol, followed by attempts at controlling the drinking habit, so setting in gear an escalating feedback loop, which can turn runaway in the direction of increasing discomfort up to some threshold ('which might be on the other side of death') (Bateson, 1972, p. 328; see also Harries-Jones, 1995, p. 42; Whitehead, 1978, p. 102).

Adaptation

But not all schismogenetic relations lead to breakdown. New workplace regulations may reduce pressures felt by employees or a buoyant labour market may afford workers the opportunity to change jobs. Similarly, pesticides may get banned as a result of growing environmental awareness in society or become less necessary when populations switch to environmentally friendlier diets. Such adjustments are often profound and longitudinal, and involve the alteration of large numbers of variables. Adaptations, however, can also only involve the modification of a small number of variables. A worker may turn to alcohol to extend their tolerance levels to cope with workplace stress; while food producers can use pesticides as 'quick fixes' to extend the critical variable of crop yield. Such adaptations can become the source of new *schismogenetic* intensifications, like drinking turning from a solution into an addiction or reliance on pesticides leading to monocultures, calorie-intensive diets and so on, requiring ever-increasing uses of pesticides to keep up the cycle. In this way, adaptations can transmit stress through different parts of the ecosystem; each adaptation depleting the overall available capacity for future adaptations (Harries-Jones, 2019, p. 153).

Budgets of flexibility

Bateson links this depletion of capacity for future adaptations with his concept of a 'budget of flexibility' (the latter term is similarly used by Whitehead, 1978, p. 100). Emphasizing flexibility means treating survival not as the result of a best possible specialization to a specific context, but of the capacity to keep adjusting to new demands, over and over again. Such adaptations require 'uncommitted potentiality for change' (Bateson 1972, pp. 396, 504). For example, in their study of *The Wire*, Zundel et al. (2013) show how short-sighted adaptations (focussed on small numbers of variables) drive intensifying patterns of violence between rivalling drug gangs and are patterned with escalating police street raids, wider cycles of post-industrial decline and a spiralling opioid crisis. As processes of adaptation, they only address mere symptoms and, over time, erode the flexibility of the entire ecological system for a more fundamental adjustment.

In considering the patterns of stress, adaptation and budgets of flexibility in the ecosystem of a digital platform, we attempt to trace the ways in which both observable events as well as their wider context are transformed.

Data collection and analysis

The materials for this paper are drawn from a longitudinal fieldwork with Couchsurfing, an early digital hospitality platform, conducted by the first author between 2013 and 2017. In contrast to studying market leaders such as Facebook, Uber, or Amazon (Zuboff, 2019; Rosenblat, 2018; Khan, 2018), there are several factors, which make Couchsurfing particularly interesting as a site of study. First, launched in 2004, Couchsurfing is a platform with a long history, hence tracing it illuminates the co-evolution of platform and environment. Despite the recent uptake in interest

in digital platforms, such longitudinal research design is still rare in organization studies (with e.g. Alaimo et al., 2020 as a notable exception). Second, Couchsurfing represents an extreme case (Flyvbjerg, 2001, p. 79). As the platform followed an unusual path in the digital economy, its study allowed for revelatory insights beyond the typical Silicon Valley success stories. Third, while the headquarters of digital platforms remain largely impenetrable to social researchers, we gained in-depth access to Couchsurfing thanks to the goodwill of numerous (mostly former) organizers, including the founders, volunteers and employees.

The research followed a 'field site as network' approach (Burrell, 2009), which involved locating the 'terrain' of the continuous effort of organizing the platform at the intersection of the digital (e.g. the Couchsurfing platform, video footage from volunteer gatherings), the physical (e.g. Couchsurfing's headquarter), and the imagined (e.g. the imaginaries embedded in the organization's vision). Split into two stages, the first stage of fieldwork aimed at understanding the experience of Couchsurfers. The second stage was a study of the history of the platform through retrospective interviews complemented by documents, videos and social media posts. In total, 81 interviews were conducted with a wide set of stakeholders, including all four of Couchsurfing's founders, a range of employees, experienced Couchsurfing members, volunteers (e.g. coders, safety specialists), and so-called Ambassadors (volunteering local organizers). Observations were conducted in the headquarter and during 21 days of couchsurfing by the first author in several locations in Europe and in the United States.[1]

[1] Detailed information about the research material is provided in the supplemental material published together with the online version of this manuscript.

Based on these in-depth data, we present the co-evolution of Couchsurfing and its environment, detailing key moments and alterations in ecological adaptation, stress and budgets of flexibility. We took our lead from our informants, triangulating events they deemed historically critical for Couchsurfing's development. Employing Bateson's ecological vocabulary (1972, p. 75), we then moved iteratively towards a processual account, linking Couchsurfing to wider environmental developments, focussing on patterns veering towards runaway, apparent through the build-up of stress, breaches of tolerance levels and adaptations across the broader ecosystem. In this sense, we focused analytically on a certain type of dynamic rather than on modelling an ecosystem in its entirety (Sterman, 2014).

Couchsurfing and the digital platform ecology

Hacking tourism (2004-2006)

The early 2000s saw the emergence of early digital platforms and do-it-yourself webpages that began to unlock hitherto private resources. eBay and Amazon popularized online transactions with users contributing free product reviews; dating sites normalized individual online profiles (Illouz, 2007); a fledgling Wikipedia established a non-profit structure of open collaboration (Jemielniak, 2014); MySpace and Craigslist pioneered online social connections (Lingel, 2020). The period after the burst of the dot-com bubble and the recession of the early 2000s was marked by enthusiasm about the possibilities of a new, more participatory, social web that was easy to access and to use by the wider public, which led to widespread experimentation (Ankerson, 2018). The same period saw the aggressive expansion of low-cost air carriers, the rise of backpacker tourism, a shift towards shorter breaks and weekend city trips, an emerging culture

of spectacle-driven destination choices and the sharing of such experiences via emerging social media (see e.g. US Travel Association, 2018). As a result, global travel had accelerated since 2000 from 699 million to over 1.4 billion arrivals per year in 2019 (UNWTO, 2019) before COVID-19-related reductions.

Couchsurfing's founding myth is a reflection of that period. Casey Fenton, the platform's originator, tells the story of how he 'hacked' travelling in 1999, when, after buying cheap plane tickets to Reykjavík, he could not find affordable accommodation. He then hacked into the University of Iceland's student directory and spammed 15,000 students with messages such as: 'Dear Björn, I'm coming to Iceland and I'd like to hang out'. According to Fenton, 'between fifty and one hundred people said "Yeah, let's hang out". … and I went to Iceland for a long weekend and I ended up meeting great people, musicians. It's just as if I got a backstage pass to Reykjavík, and I thought, leaving, this is how I need to travel, every time. So that was the genesis of Couchsurfing' (#82)[2]. Fenton and three of his friends founded Couchsurfing in 2003 as a non-profit digital hospitality platform (www.couchsurfing.com), matching free short-term accommodation between members. The vision stated: 'creating a better world, one couch at a time' (#85, #94) by offering an alternative form of tourism, which enabled members to open their homes to new friends and to authentically experience different cultures through local hosts.

Ecologically, Couchsurfing and similar platforms were born from the interaction of growing global tourism and expanding digital technology, in turn setting off new patterns. As hotels were only

[2] Quotes and documentary information indicated by the numbered references are provided in the supplemental material published together with the online version of this manuscript.

slowly able to expand and adapt to growing demand (Salvioni, 2016), budget travellers, such as students, found a niche for alternative travel practices online (Urry, Larsen, 2011), initially adding a small number of different accommodation spaces offered within small and often tightly linked online communities (Molz, 2013). In this environment, Couchsurfing was one of the first platforms with a peer-to-peer review-based reputation system and member verification; both early versions of what is industry standard today. It charged only a small fee for voluntary member verification, which, combined with member donations, remained the only source of revenue for most of its existence. Together with other early hospitality platforms, such as Hospitality Club and Global Freeloaders (#63), it began unlocking houses, flats, rooms or just sofas, to bring them into the domain of travel and tourist accommodation. In a recursive manner, the growth of these platforms started to make such peer-to-peer hospitality apparent to ever more travellers. Replacing the need for personal relations and interpersonal trust with recommender and feedback systems allowed Couchsurfing to quickly scale into thousands (and later millions) of members, as it developed a cool, open and communal reputation (#53), promising that '[membership] would be free forever … [and that] we would never do any advertising on the site' (#78).

We can understand the ecological aspects of the platform's early development in terms of interlinking variables. Couchsurfing was a quick fix of the shortage of travel accommodation (a variable reaching its upper-level threshold of tolerance, felt through the rising costs for hotel beds) by mediating private spaces and so extending the tolerance of this strained variable. But because variables are interlinked, extension of the variable of 'accommodation' pushed others towards their tolerance limits (see Bateson, 1972, p. 504). In particular, the growth in user

numbers put a strain on Couchsurfing's IT system, which required (as a correction) extra work time to keep from crashing. Fenton, who was the sole programmer in those early days, found himself investing more and more of his time to keep fixing bugs, adding new features requested by members, and expanding capacity, working 'days and days in a row without sleeping, just more coffee, programming and programming and programming' (#83). The dynamics between developing the platform and its growth continued to push the IT system's tolerance level: the more the platform grew, the more programming was necessary, allowing for further increases in the growth rate. But once the growth exceeded the platform's carrying capacity, as well as the limits of Fenton's time and skill to address on-going demands, the platform, cobbled together as it was, catastrophically crashed in 2006.

Open collaboration and goodwill (2006-2007)

The crash involved substantial data loss beyond recovery, which made Fenton announce the end of Couchsurfing. However, rather than giving in, the Couchsurfing community vocally expressed their moral support and a group of volunteer programmers and organizers, who happened to be meeting with Fenton in Montreal as the crash happened, helped build a new platform in only ten days. There was much goodwill in the Couchsurfing community, with many volunteers already engaged in bug-spotting and online community activities. Hence, the crash appeared as a 'blessing in disguise' (#95), as it offered a relief to the strained IT system and Fenton's work time. By inviting large numbers of volunteers to participate in platform development, these strained variables were extended substantially. But this also changed the relations between Couchsurfing's founders and the community.

One of the early volunteers recalled seeing themselves 'not only [as] a part of the organization… but changing the world. … I'd say, we thought about it naively… but … we were absolutely sincere' (#55). In what came to be known as the 'do-ocracy' at Couchsurfing, volunteer groups mushroomed around the globe, donating time and effort to implement projects, develop code and organizational policies, but also travel guides and online discussion groups. The atmosphere was described as 'everything kind of blew up. During that time, it was very interesting to see the enthusiasm. ... Everybody was just, like, "fuck it, let's just fix it. You know, get it going again"' (#63). Couchsurfing's openness to volunteer contributions distinguished it from other hospitality platforms at the time, such as Hospitality Club, and resonated with strands of hacker culture, epitomized by projects such as Wikipedia and Del.icio.us (Benkler 2006) as well as the rise of communicative free labour such as chat hosting, often for for-profit platforms (Terranova, 2000).

This inclusion of large numbers of members provided a substantial extension of the tolerance level of 'labour' that had hitherto limited the adaptation of the IT system, in turn unlocking further growth of the member base and traffic. Yet, this growth began to strain other ecological variables in the environment. As it is quite typical for open collaboration communities, coordination problems emerged. Linux, for instance, manages coordination through a modular architecture, allowing members to work independently on different modules while more privileged members curate the core of the operating system (Kelty, 2008). Couchsurfing, by contrast, had neither a modular architecture, nor clear curatorial policies. Hence, by the time the (rebuilt) platform had grown to 190,000 members in 2007, the lack of coordination structures led to conflicting efforts and messy organization.

As ‘it is hard to tell a volunteer what to do’ (#63), ‘different people had different ideas, and everybody thought that their idea was… the way it’s going to work’ (#65). Controversies ensued about the direction of the platform, involving the funding model, which so far was limited to donations, and discussions about open-sourcing code versus keeping it proprietary; scaling versus community focus; and centralization of control versus user inclusiveness. Increasingly, Fenton and his informal leadership circle were blamed for lack of leadership and the decision-making process, which ‘wasn’t very clear, [probably] not even [to] Casey himself’ (#65).

Drawing on the goodwill of its member-base to volunteer had resurrected the platform and corrected the programming limits. However, in so doing, Couchsurfing had become dependent on these volunteers to continue the platform’s development and this dependence became a source of new stress. The lack of coordination, for one, resulted in ‘spaghetti code craziness’ (#64), making the platform buggy and unreliable. Furthermore, the relations between Couchsurfing’s informal leadership and its members engendered rising tensions: the platform needed to be developed and maintained but doing so meant relying more and more on the free work of its users, which meant losing control over its development.

Relations ‘started really getting inflammatory’ (#81), when some turned to the leadership for a sense of direction: ‘everyone was, like, “What are we doing, Casey?”’ (#71). The pressure for more central management, however, also resulted in ‘so many people [feeling] disenfranchised, [because] Couchsurfing… has turned their back on them personally and turned their back on communalism as an organisational model. And some people were very, very bitter’ (#55). Some infuriated volunteers tried to take matters into their own hands, voicing dissent in online forums

and driving their own innovations, which culminated in a group of engaged volunteer programmers launching a campaign webpage called Open Couchsurfing. This development made apparent a cleft between two diametrically different visions of Couchsurfing's future: one as an open, commons-based platform (a Wikipedia for travelling), advocated by the campaigners, and another seeing Couchsurfing as centrally coordinated and scaling (a Facebook for travelling, albeit with a non-profit funding vehicle), supported by some of the leaders.

Charity application and control (2007-2011)

As a counter to the calls for a commons-based Couchsurfing, a formal Leadership Team was installed around Fenton, which began to opt out of the platform's volunteer dependence. The new leadership ousted the small but vocal group of volunteers behind the Open Couchsurfing webpage, some of them having contributed considerably to the coding efforts, and announced that Couchsurfing will not pursue the open-source path. To convince the critics of its willingness to keep Couchsurfing to its vision, leadership began an application process for charity status in the United States, which would grant 'worldwide recognition as a philanthropic organization', 'increased legal protections and accountability', ensure that donations towards Couchsurfing would be 'tax-deductible in the US', and grant some independence from user payments by becoming 'eligibil[e] for financial grants' (#87).

Opening the platform development to volunteers in 2006-07 turned out to be a quick fix followed by yet another quick fix, as Couchsurfing's new leadership ousted the group of vocal volunteers from the platform to alleviate the strained 'control' variable. Against that background, a 'Volunteer NDA' (non-disclosure agreement) was introduced. This was argued to help retain

volunteers for longer periods, protect members' data, as well as strengthen the charity status application. However, as the NDA included a non-compete clause, both tech sector workers and Couchsurfing members engaged in other open collaboration projects were being excluded from working on the platform. Moreover, the agreement was subsuming volunteer contributions (such as code) under the organization's intellectual property, which further aggravated open-source enthusiasts and prompted some of them to quit.

Meanwhile, the member base kept on growing, putting additional requirements on the platform's technical stability and the volunteer teams. As volunteers were still largely seen as unreliable – for instance, some travelled frequently, turning out to be inaccessible when most needed – there was a growing recognition that key collaborators should be moved to paid positions and the ephemeral community work should be replaced by a permanent office. The charity application was further complicating these circumstances, as it not only required changes in engrained habits and patterns, introducing more formal organizational hierarchies and processes to satisfy the US authorities, but was also dragging on, consuming ever more organizational resources.

These adaptations were putting the financial resources under significant strain, as Couchsurfing 'went from this collective model ... to wanting to hire and retain talent on more of a long term... So, it was like, "We can pay for a bunch of people ... or we can deal with legal fees for our [charity application]," and the [latter] was more important at that point' (#54). The charity application 'with the top non-profit attorney who specializes in this kind of stuff [cost] hundreds of thousands of dollars' (#78). Likewise, establishing the new headquarters in San Francisco at a time when the

city was becoming the cradle of a new cohort of venture capital-funded platforms such as Twitter or Airbnb, spawning a stiffer competition for IT personnel, further exacerbated the strain on Couchsurfing's budget. As a result, finances were too short to further develop the platform to keep up with the growing user base, which surpassed one million in 2009 (#74, #50). The 'tech team had [to deal with] breakdowns' (#80) of the platform, which was becoming even more unreliable. Forcing members to turn to other platforms to communicate with peers and organize their travels, Couchsurfing was further losing the goodwill of its community, in addition to the strain on labour and money.

These adjustments meant a period of stress that reduced the flexibility for subsequent changes. Bateson (1972, p. 497) reminds us that 'flexibility is a resource as precious as oil or titanium and must be budgeted in appropriate ways, to be spent (like fat) upon needed change'. Such flexibility existed in terms of the free time and goodwill of volunteers to give free labour, the enthusiasm and trust by those sharing their homes with strangers, and the benefit of the doubt granted to Couchsurfing as a non-profit supported only by donations and volunteers, who were 'doing their best' (#10). However, the gradual downgrading of the collective in favour of centralized control and the increased reliance on paid personnel also resulted in the growing perception of the central functions as 'snobs' (#74) who did not care about the 'expectation that the staff of Couchsurfing should be friends with all the Couchsurfers in San Francisco and be at the events and things like that. But the staff …, they just wanted to work' (#74). The alleviation that came with formalizing the organization led to the loss of goodwill of volunteer programmers and community organizers, who became disillusioned and started leaving the platform.

It is against this backdrop that in 2011, after more than three years and substantial investment, that Couchsurfing's charity application was rejected. The US authorities doubted that 'merely provid[ing] a platform' (#88) is a charitable activity and, instead, classified the organization as a social media company, not unlike Facebook. This was the result of a change in public perception as notions of the internet as a driving force for the freedom of information and an open, more democratic society, which was still very much alive during Couchsurfing's foundation years, had made way for commercial and corporate interests. Following Google's IPO in 2004, scaling digital platforms through free applications in order to then harvest data and sell ad-spaces had become a prevalent business model, driving the rise of corporate digital platforms to dominating, quasi-monopolistic positions. Public concern about the influence of these platforms, particularly Google and Facebook, also grew with knowledge of how they centralized and partitioned the digital ecosystem into 'walled gardens' and invaded people's privacy (Zuboff, 2019). These developments of commercialization, centralization, and profiteering made the US authorities sceptical about the charitable zeal of Couchsurfing: 'it came down to perceptions and their perception of us…. This whole crazy "we're travelling around and having people volunteer, and we're a website..." [did not win us the trust of the authorities]' (#55).

What is striking is that Couchsurfing, aiming at an adaptation more complex than a quick fix, was pursuing to legitimize its charity status and to secure more stable revenue from a larger pool of donors by scaling its user base similarly to mainstream, corporate platforms. However, this pursuit drove Couchsurfing into a tangle, in which the formal organization was increasingly perceived as rigid and corporate by the members, and as unprofessional and suspicious by the authorities. The relationship between platform and environment was not flexible enough

anymore for the two to co-evolve; that is, it was not only Couchsurfing who failed to adapt to broader environmental changes, but also the environment (such as members and authorities) that failed to adapt to Couchsurfing's efforts to lessen its dependence on volunteer work while developing into a legitimate non-profit.

Blitzscaling and venture capital (2011-2015)

Without charity status, Couchsurfing owed significant historic taxes and, having depleted much of the financial resources, had no means to cover their costs. The leadership responded by pivoting. It shut down the non-profit in 2011, transferring the rights to the platform, including all user data, content and code donated by the volunteers, to a newly established for-profit incorporated in Delaware and headquartered in Silicon Valley. Couchsurfing adapted to the for-profit context at a time of substantial financial investment, with aggressive investors speculating on the next big hype. For example, Airbnb's investments leapt from tens of million US$ in 2010 to hundreds of millions between 2011 and 2014, to US$1.6b in 2015, amounting to a total funding of US$5.4b before Airbnb raised another US$3.5b at its IPO in December 2020 at a market value of US$47b ("Crunchbase: Airbnb," n.d.). Attracting a total of US$ 22.6m in venture capital between 2011 and 2012 ("Crunchbase: Couchsurfing," n.d.), Couchsurfing was able to pay the outstanding debts of the defunct non-profit, securing the organization's survival. As the member base was not consulted about this switch, there were significant misgivings of core members, some of which left in protest. Still, the user base continued to grow, turning Couchsurfing into a mainstream platform of almost 4 million members by 2012.

Joining the Silicon Valley scene as 'the oldest start-up ever' (#71), the atmosphere in the company was hopeful: 'Everyone was just kind of like, "Oh, we're doing well. We have all this money. Airbnb is blowing up. Couchsurfing can ride the tails of this industry that we helped pioneer. It should be a great thing"' (#75). However, the staff, made up largely of ex-volunteers, were perceived as mere 'amateur hippies' (#74) by the investors and increasingly replaced with typical Silicon Valley programmers and digital strategy experts. As these had to be hired from the highly competitive labour market of the San Francisco Bay Area, operation costs continued to inflate. Furthermore, financial backers, keen to repeat the success of Airbnb (#68; #49), expected Couchsurfing to become another 'walled garden' with exponential user-growth, algorithmic features, mobile apps and revenue streams, delivering a significant return on investments. The adaptation to the start-up scene thus quickly turned from an alleviation of the financial strain into a new source of stress.

Struggling to square its historic pledges against advertising and membership fees, many alternative revenue sources (such as charging for special services such as dog walking) were trialled but not realized (#68). A project to develop a 'Social Engine', a system to 'algorithmically match a surfer to a host' (#66), was promising, but failed to deliver and was discontinued after consuming most of the investments. At the same time, many of the remaining local community organizers who were 'keeping [Couchsurfing] together… [because they] really looked out for people …; felt betrayed … [and] kind of started folding. … Now, you've lost their heart. … That whole thing just start[ed] triggering a domino effect' (#71). This was further amplified as the company got 'rid of almost every [volunteer] team. … [Because it] can't be a corporation and have volunteers' (#42). Likewise, some users became wary of the company abusing 'data that

you put in there' (#9) and 'making money on [their] previous voluntary work and on [their] hosting' (#92). The frustrations from parts of the members even culminated in rumours that 'Couchsurfing [started] editing and deleting some profiles [of] members who [were] trying to criticize [it]' (#15).

Being a for-profit and failing to innovate and improve the platform, Couchsurfing's user base was less forgiving than during non-profit times. '[Couchsurfing has] money now. They can hire programmers to … [make] the website more useful. … [Instead,] Couchsurfing is a story of not being able to find what you want, and they keep adding [new features], and … they have never, in my opinion, been effective' (#35), as one member put it. The Silicon Valley funders and strategists now in charge of Couchsurfing, in turn, simply assumed that 'there is always more fish in the sea' (#42) and new, more numerous cohorts of users will easily replace the disgruntled ones.

In a runaway dynamic, burning more and more of the investment budget was leaving the company with fewer and fewer options to experiment, while at the same time aggravating the members, in turn leading to more and more aggressive experiments oriented towards finding a revenue model. Once most of the venture capital money was spent, layoffs followed. In late 2013, the company shrank from about 50 to 12-15 employees (#66). Ultimately, the non-obligatory one-time verification was turned into a voluntary subscription and advertisements were introduced, which kept Couchsurfing afloat, but failed to produce the expected 10:1 return on investments (#75). Losing their patience, the investors withdrew and, in late 2015, Couchsurfing was bought by a private fund, Dugan Katragadda Inc., retaining 10-15 employees. At the end of

data collection, the company claimed to have some 18 million members (#90), with about 4 million active Couchsurfers and 400,000 active hosts (#91). Having left the 'start-up game', Couchsurfing now inhabits a niche, further threatened by the effects of the COVID-19 pandemic, while its successors continue to scale up.

Discussion

The aim of our paper was to understand the role of technology in terms of processes of growth and intensification and, more specifically, how digital platforms are implicated in these processes by altering the very context in which they unfold. Via Bateson's analytical concepts we have attempted to show that digital platforms represent what Bateson called 'conscious purpose'; interventions aimed at maximizing certain variables in an otherwise complex set of relations.

Our analysis suggests a reconsideration of the notion of control in the context of digital platform organization. Rather than having oversight and means of adjustment of the entire system, or even being responsible for the programming and ordering of operations, the role of human actors in our case was much smaller and more haphazard. Their role was to organize by fixing, making new connections, or framing states of affairs so that things can keep running, but doing so without an overall design or direct influence over their direction (c.f. Vaccari, 2020, p. 48). In empirically elaborating how the build-up of stress and subsequent adaptations occurred, we tried to show how intensification happened as part of an open (Simondon, 2012) arrangement of networked elements that could readily switch from one setting to another, seemingly overcoming any limits and limitations to growth.

In departing from mechanistic and causal understandings and devising an analytical way of grasping the supplementary nature of technology in its broadest sense (Nancy, 2013), we showed how these processes are merely part of a totality of which we, and everything else, are a part as well – and that ignorance of these wider relevancies bears dangerous and potentially lethal consequences. Rather than seeing digital platforms as generating a future state of singularity, positive solutionism and human fulfilment through unbridled technological acceleration (Vaccari, 2020), the consideration of their effects on wider contextual patterns highlights their doubly dangerous nature. Beginning with a lack they address, digital platforms harbour the potential to create series of 'solutions', each of which creates new problems, that require new and more expansive solutions. This elevation of conscious purpose as the only form of purpose is accompanied by the transformation of ways of living and being that become increasingly dependent upon the continuation of the runaway condition. Rather than being actual solutions, these technological fixes set in gear intensifying patterns which lead to the overall degradation of the context in which platforms operate. This, perhaps, is the most profound and alarming insight revealed through our analysis: that the nature of digital platforms is precisely this unshackled process of intensification and that, in considering the depletion of our budgets of flexibility, we can see how with each adaptation we become a bit more specialized and committed, each time losing a little of the wiggle room we require to re-adjust to the next change in environmental conditions.

Stress, adaptation and budgets of flexibility in the digital platform ecosystem

Our study of Couchsurfing traced the co-evolution between platform and relevant environmental conditions, starting with the rise in tourism and an ensuing strain on the variable of hospitality, felt through high prices for hotel rooms. Couchsurfing provided a quick fix, adding further beds to the system by unlocking hitherto private domains, alleviating some of the stress. We traced these developments in our empirical materials, adding wider contextual information (e.g. by comparing the developments we observed with those of more 'successful' platforms) to make sense of the wider patterns. This is neither done in cause-effect logic or with a view of a particular sequence or end, but by providing a sense (by reading the ways patterns are patterned) of how digital platforms may come to debilitate overall ecological well-being (in terms of budgets of flexibility and capacity to adapt).

To conceptualize organization in such terms means to consider not just changes between the organization and its environment, but changes to the patterns of these changes (de Vaujany et al., 2020), as the focus of inquiry remains not on an organization or individual manager, and how well they adapt to environmental changes, but on the whole 'organization-plus-environment' couplet, that is the ecosystem (Adner, 2017; Jacobides et al., 2018; Teece, 2007). It is for this purpose that we drew on concepts Bateson developed for detecting intensifying patterns and thresholds of ecological tolerance in order to observe *how* the flexibility of the relationship between platform and environment got depleted.

Seen in a broader purview, the story of Couchsurfing is indicative of wider, ecological developments, by which a loss of flexibility has become the price for escalating growth across the whole digital platform ecosystem, only to be maintained by massive financial investments. In our

case, we have shown how the goodwill of volunteers to step into the fray to rebuild the platform and develop Couchsurfing's community was gradually eaten up, leaving the platform unable to mobilize the same sort of support later on. This depletion of flexibility was not located *within* the formal organization, but manifest in the patterns of the relationships *between* the platform, volunteers, regular users, databases, technological infrastructures, other digital platforms, venture capitalists, regulators, and so on and so forth. This found an expression in, for instance, the loss of trust of public authorities in the benign nature of digital platforms resulting in the rejection of Couchsurfing's charity application, and finally the waning belief of venture capitalists that Couchsurfing could mimic the successes of other platforms.

Viewed this way, digital platforms are an expression and part of new ecological pathways and connections made by digitalization (Cooper, 2010; Kallinikos, 2006). Digitalization does not only allow for technological fixes to be developed much faster (it took, after all, only ten days for a handful of volunteers to resurrect Couchsurfing after the catastrophic crash in 2006); it also allows for stress to shift faster and further. For this, digital platforms are an instrumental organizational form; as we have tried to show, they are entangled in and thus intensify the dynamics of entire ecosystems, as they quickly and often effortlessly extend any strained variables. As Bateson (1972, p. 509) warns, there is a short-sightedness to such technological fixes, which maximize single variables at the expense of the long-term well-being of the ecosystem. Yet, digital platforms are specifically designed around single variables, which can scale at incredible rates, increasing the propensity for escalation (Constantinides et al., 2018; Zuboff, 2019). It took Couchsurfing only a few years to scale its operations from adding a few hundreds to millions of short-term accommodations as a quick fix to the tourism industry and to

do that with relatively little effort, when compared to the costs that come with scaling conventional hotels. Airbnb provides a more extreme instantiation of this pattern.

These dynamics do not remain contained to the digital domain of course: house prices, for instance, rise while home-owners become more dependent upon secondary incomes from platform rentals (see Lindeman, 2019). Dominating platforms such as Airbnb spawn dependent sub-industries, including cleaning, new types of insurances, or price-gauging services while cities and councils invest in infrastructure to deal with masses of tourists, and so become reliant on the taxes gained from the tourism business, in the same way investors have become reliant on rising platform valuations – making all involved less and less able to develop alternative or novel pathways (see Kauffman, 2019, p. 151). Similarly, rampant radicalization in social media echo-chambers evades oversight and corrective intervention, such as Facebook or Twitter's algorithms that stimulate ever more volatile and polarized user interaction in our public discourse (Kurgan et al., 2019). All these can be understood as the consequences of technological expansion as extensions of tolerance levels and adaptations.

The long-lasting, deeper consequences of the rise of digital platforms are difficult to foresee as digitalization, as a process of transformation, operates on multiple scales and at different speeds. And it is here that we find limitations with Bateson's concepts, as they are not helpful in distinguishing different rates of change. Digitalization is typically associated with fast, disruptive (and at times destructive) change and our paper certainly subscribes to that notion, as we focus on the impressive capabilities of digital platforms to scale rapidly. However, as we indicated above, there are also changes on an infrastructural and institutional level, which unfold, like

tectonic shifts, over longue durée (Ribes & Finholt, 2009) and remain invisible to most of society (Bowker et al., 2010). In this sense, it is by no means clear *how* small scale patterns that unfold in biographical time, such as volunteers losing their goodwill to help Couchsurfing, inform and, in turn, are informed by large scale patterns that unfold in historical time, such as the 'infrastructuring' of digital platforms in contemporary capitalism (Ekbia & Nardi, 2017; Zuboff, 2019). For Bateson, it was enough to observe that patterns of change intensify without having to account for whether that intensification plays out over years or decades or centuries (Holling, 2001). This has also methodological implications, as accounting for different time scales significantly increases the challenges of drawing boundaries of ecosystems for analytical purposes without truncating wider feedback loops and ecological patterns (Phillips & Ritala, 2019).

Finally, there are many aspects of Bateson's work that remain unclear or stand in need of re-evaluation given the rise of digital systems. Bateson was almost exclusively focused on 'living systems', paying little heed to the material qualities of non-living systems. Indeed, it was only during the later stages of his life, that he attempted, but as he himself admitted never accomplished, to find the pattern that connects life, motivated by information and difference, with the non-living, driven by physical forces and causes (Deacon & Sherman, 2008). It is only recently that New Materialism has been paying attention to how non-living material systems, be it steel or stone or tissue, exert their own patterns of being as part of the world and not just as its mere material substrate (DeLanda 2015). In arguing that non-living, material systems have the capacity to self-organize and, therefore, are already informed systems, such accounts contradict Bateson's notion that only life is informational (Deleuze & Guattari, 1987; Herzogenrath, 2009).

This opens up further avenues for future organizational studies of digital technology as self-organized and materially informed system (Márton, 2009; Leonardi et al., 2012). Despite being involved in the foundation of cybernetics, Bateson was never interested in digital technology, only referring to computers in passing (Bateson, 1972, p. 316-317). Moreover, as technological change is increasingly mediated by binary code, its intensifying patterns become less and less observable, not just because they happen at speeds beyond human perception, but because they no longer need to involve objects, images, or humans making decisions. Our extraction of three analytical concepts and our brief discussion of metacommunication and self-referentiality is an attempt at bringing Bateson's thinking back into organization studies and to the consideration of the transformational role of technology – and we hope his work will receive further attention and elaboration as well as critical assessment in light of the changing context of digital and platform-based organization.

Technology and organization studies

Digital platforms accelerate the extension of human organization out into its external space, and in so doing, they transform the nature of social and managerial control. Rather than conceiving organizations or individuals in terms of concrete boundaries, with a focus on the specificities of these things themselves, Bateson's work emphasizes movement between things and elements of the world. Technology is therefore not simply an instrument of human control, but a disclosive process that continually produces forms out of its infinite and formless surround (Cooper, 2010). This means that the acceleration of the 'circularities of the self and the external world' (Bateson,

1972, p. 419) not merely changes organizations, but the whole of 'organization-plus-environment' (Schreyögg & Sydow, 2010; Gawer, 2014; Ciborra, 1996).

To refer to these changes by simply invoking the term 'ecosystem' as a label without drawing on ecological considerations the term is based upon is not enough, because digitalization introduces a new relationship between organization, technology, and environment, of which digital platforms are arguably the most revealing instantiations. Understanding this new relationship goes beyond the typical approaches in organization and management studies – that is, following Heidegger (1977), to see technology as a means to 'enframe' the environment into a passive and obedient resource waiting to be brought into a productive arrangement; or the way it is conceptualized in the risk society (Beck, 1992), in which the irresponsible use of scientific technology triggers a mindless environment to react mechanically and, by doing so, to compromise the sustainability of organizational forms and the survival of institutions or even the human species at large (Luhmann, 1993). Such views have been tremendously helpful for understanding how platforms, such as Facebook, harvest the social interactions and experiences of their users and process their profiles into datafied and value-generating audiences (Zuboff, 2019).

However, as ecological research has demons trated, the environment is neither passive nor reactive but organized and actively disobedient – it is itself informed (Bateson, 1972; Herzogenrath, 2009; Meyer et al., 2005). This condition is further exacerbated by the digitalization of all aspects of life, in an algorithmic governmentality that has exceeded the idea that the organizational environment can still be subject to control (Márton, 2009; Stiegler, 2018).

Instead, we witness a proliferation of environmental agency, enrapturing an entire epoch of humankind (Stiegler, 2019) by media technologies 'ranging from sensorial to algorithmic environments, from bio- to nano- and geotechnologies, [which] renders environmentality visible and prioritizes it like never before' (Hörl, 2017, p. 9). It is against such backdrop that we showed through our analysis that digital platforms exceed bounded notions of business, organization or technology, as they ceaselessly create, maintain and dissolve relations with social and material constituents of the ecological systems, which they transform by continually creating new distinctions; new insides and outsides.

Conclusion

In this paper, we drew on Gregory Bateson's (1972) 'ecology of mind' to theorize the recursive relations between organization and environment in the context of digital platforms. Applying ecological concepts of stress, adaptation and budgets of flexibility, we traced the rise and fall of Couchsurfing, one of the first digital hospitality platforms, based on the mutual adaptations between platform and environment. We demonstrated that processes of technological expansion result in extensions of tolerance levels, which can gear towards pathological runaway patterns that deplete the potential for future adaptations in the ecosystem, leaving it vulnerable, with little flexibility to adjust to new situations. As such patterns invoking the loss of ecosystemic flexibility can probably be observed with other digital platforms, the ecological question is how we can keep our, as it were, increasingly domesticated ecosystems flexible, considering a more systemic focus on their wider ecological well-being and long-term viability. Such considerations,

we argued, will require a shift away from conventional notions of control towards an ecological view, characterized by relationality and interconnectedness.

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