HYBRID CITY 2015

DATA TO THE PEOPLE

PROCEEDINGS OF THE 3RD INTERNATIONAL BIENNIAL CONFERENCE

ATHENS, 17–19 SEPTEMBER 2015
NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

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UNIVERSITY RESEARCH INSTITUTE OF APPLIED COMMUNICATION
ATHENS 2015

ISBN 978-960-99791-2-2

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First published in 2015 by University Research Institute of Applied Communication (URIAC),
National & Kapodistrian University of Athens,
Athens, Greece

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An Environmentalism for Environmental Media

Ambient Commoning as Cultural Technique

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Abstract. As envisioned by the pioneers of ambient intelligence, the technologies of communication, networking, and sensing are disappearing into the 'ambient commons' of our urban environments. This essay explores the ethical and political stakes of the enclosure of this ambient commons as a new cross-sectoral sustainability concern that arises in the wake of informatization, the rise of an internet of everything, and the establishment of smart city infrastructures.

Keywords: ambient commons, cultural technique, collective governance, depletion design, economic and environmental justice, infrastructure studies, parametric politics, seamfulness, subjective economy

I. INTRODUCTION

In the age of ambient media, environmentalism and sustainability refer not only to the transformation of our material environments, but to the ways in which ambient media affects the way we experience, communicate, create knowledge, engage with others in the pursuit of life and labor. Taking the framing concept of an „ambient commons" as its point of departure [1], this essay develops ambient commoning in relation to ambient media, the subjective economy, strategies of depletion design and the question of citizen agency. An overview of key concepts is followed by a brief account of the enclosure of the ambient commons in processes of infrastructural informatization. To explore this enclosure and focus on questions of economic and environmental justice, the essay defines ambient commoning as a cultural technique, elaborated in relation to the dynamics of collaborative constitution, worldmaking, and a parametric politics.

II. KEY CONCEPTS

A. Ambient Media

Ambient media refers to the 'environmentalization' of media: from media as (separate) tool to media as environment.

Technologically, this shift is driven by a series of overlapping ICT developments, including ambient intelligence, pervasive / ubiquitous computing, the availability of real-time networking infrastructures, and the deployment of sensor networks especially in urban contexts. In terms of interface design, the 'disappearance' of media into our environments is a consequence of the shift from command line / graphic user interfaces toward natural user interfaces (gesture / touch, speech, eye / motion tracking).

Economically, this shift is supported by new economies of capture and commodification aiming to integrate the data (exhaust) we generate into new value chains, driven (in the US) by the "Big Five" (Amazon / Apple / Facebook / Google / Microsoft), a GE-led "Industrial Internet" coalition (including AT&T, IBM, Cisco, and Intel) hoping to automate infrastructures, and a host of lesser-known actors in the emergent ecosystem of a commercial "sharing" economy [2].

Politically, this shift has been supported by enthusiasm for big data and internet-of-things policies and strategies as well as the prioritization of technological over cultural, economic or social innovation [3]. Raising hopes for the democratization of processes of governance, it has also met with growing resistance to surveillance, both private (commercial / corporate) and public (intelligence / security) [4].

Culturally, this shift has raised a number of concerns, including the disappearance of 'the public' as more or less homogeneous phenomenon (constituted and maintained by centralized and highly coordinated forms of mass media) and the rise of divergent-yet-overlapping 'micro-publics' (enabled by a wide array of mobile and networked communication media). Analyses of exhaustion have explored the increasing difficulty to maintain clear boundaries between labor and leisure, resonating with a long tradition of cultural ambivalence regarding new forms of techno-social organization [(5), (6)]. Challenging the disciplinary divisions of knowledge production, this shift has also been accompanied by cross-disciplinary analyses of digital infrastructures [7].

B. Subjective Economy

As a condition and consequence of the individualization and personalization of digital goods and services, experience itself has become a key terrain of economic valorisation. The concept of a „subjective economy" shifts attention from goods and services to the implications of these developments for individual personhood and the ways in which they constitute and constrain the agency of individual and collective subjects

[8]. As the individual subject becomes the focus of new growth paradigms, the question of agency – its constitution, scope, and forms of articulation - acquires a new relevance as the subjective economy exhausts, exploits, and empowers us at the same time.

The branding choice of Apple's 'iDevices', for example, explicitly refers to the space of communicative experience and self-relation as exemplary terrain of capture. This data capture does not follow a model of repression but of enjoyment and incentivization. The more data we share, the more comprehensive our online profiles become, the better recommendation algorithms work, for example. The experience economy follows a logic of affirmation, at odds with the logic of conflictual encounter and dissensus that is a core dynamic of democracy. Facebook's like is exemplary of this logic of active affirmation that is now an integral part of communication and consumption (we are invited to 'like' friends, goods, services, corporations, politicians). This means that new media monopolies have the power to change the way we relate to each other. And even if we use social media to organize, we still have to agree to end-user licence agreements that give platform owners wide-ranging rights over our data [9].

As many of these services are offered without fees, discussions of this trade-off have been limited, often cast in the narrow terms of privacy rather than as broader design or sustainability issues [10]. Because of this, ambient commoning combines the analytical focus on questions of ownership and media concentration (political economy) with a focus on the transformation of experience (anthropology, cognition science, philosophy). As new goods and services increasingly revolve on the design of new experiences (rather than simply improvements in efficiency or performance), arts-and-technology alliances are becoming more important both to the dynamic of ambient media (note the interest of corporations like Intel or Lego in partnerships with art schools and design academies, as well as the popularity of experience design approaches) and its critical analysis.

C. Ambient Commons

To address these developments, we can comprehend the contemporary media environment as an ambient commons that is threatened by new forms of enclosure and calls for a new approach to sustainability. The focus on 'ambience' captures the environmental character of media [(11), (12)], but also recalls the holistic interest in the ethical implications of ambient media shared by ambient intelligence pioneers but a minor concern in current ambient intelligence / pervasive computing / ubicomp research [(13), (14)].

A commons is a general term for shared resources in which each user has an equal interest. Relations among users are based on collective governance frameworks of interdependence, cooperation, and shared use rather than exclusive property rights. In the analysis of sustainability, the commons has been one of the most significant concepts, increasingly applied to computational environments [15]. Long dominated by ahistorical accounts of the so-called 'tragedy of the commons' (overuse as a consequence of the absence of regulation, an ‚absence' that effectively ignored the rich tradition of governance systems based on neither state nor market), contemporary analyses have emphasized commoning as a form of collective self-determination aimed at maintaining and reproducing commons for present and future use. Because its cultural, economic, and political conditions of possibility are distributed and regulated across multiple layers of governance, a commons is always both local and translocal. To engage the enclosure, these layers must come into view as possible terrains of intervention [16].

D. Depletion Design

In the age of ambient media, environmentalism and sustainability refer not only to the transformation of our natural / physical environments [17], but to the ways in which ambient media affects the way we experience, communicate, create knowledge, engage with others in the pursuit of life and labor.

A collaborative transdisciplinary framework for research and design, depletion design is a response the conceptual and methodological demands of 'post-normal times' of crisis and the depletion of both physical and psycho-social resources as a consequence of the growing stress on natural and social environments. It places the commoning of design strategies in a broader transcultural horizon [18], taking into account post-growth approaches to economic development (ecological economics, social progress indicators), focuses on environmentalisms that bridge the culture/nature divide (ecological urbanism, environmental justice, social and political ecology, anthropocene studies), and combines these with experimental approaches to design [(19), (20), (21)].

E. Citizenship as Field of Conflict

To follow and assess the development of smart citizenship paradigms, attention to the historical dimensions and structural transformation of citizenship approaches citizenship not as a given but as a field of conflict. The "states of shock" [22] in the wake of modern political economy and its attendant transformations in the psycho-social sphere leave many people without a powerful sense of their own agency - regardless of their citizenship status. As the smart city-discourse has already begun to give way to reflections on "smart citizenship" [23], new opportunities arise to affirm smart citizenship not as the subsumption of the exercise of individual and collective rights under the technological solutionism of infrastructure informatization, but as coupling of comprehensive media literacies with collaborative forms of mutual engagement that acknowledge and address these conflictual dynamics.

III. ENCLOSURE OF THE AMBIENT COMMONS

The idea of an ambient commons takes its point of departure our position in the subjective economy, combining attention to the transformation of experience with analyses of the infrastructural changes that make this transformation possible. Reflecting on the ethical responsibilities of technology designers, ambient intelligence and ubiquitous computing pioneer Mark Weiser has famously offered „Weiser's Principles of

Inventing Socially Dangerous Technology: 1. Build it as safe as you can, and build into it all the safeguards to personal values that you can imagine. 2. Tell the world at large that you are doing something dangerous“ [13]. This is not what has come to pass: the key actors promoting the environmentalization of media insist that they ‘do no evil’ (Google), arguing that the corporate ownership both of data and its attendant massive-scale information infrastructures is, in the end, the best way to increase individual freedom.

Early visions of a democratization through technology need to be revisited in light of what is almost a decade of experience with attempts to integrate urban environments into the dynamic of informatization. The growing adoption of sensor-based ‘internet-of-things’ technologies and the becoming-ubiquitous of media in the ‚smart cities’ in which we live and work establish new forms of enclosure no longer subject to collective decision-making and governance. The development of logistical infrastructures for surveillance-based service delivery („platform capitalism“) has neither increased the scope of citizen involvement nor strengthened the cause of civil rights [(24), (25)].

As both the flaneurist freedom that characterized early visions of the urban experience and the situationist subversion of architectural attempts to structure our experience are crowded out by the vision of the city as a machine of capture, the very idea of an urban commons – of sites and spaces open to reappropriation, the invention of new uses, the provision of public goods, and the autonomous constitution of collectivities – disappears. If the ambient media environment becomes a major interface to the city, as foreseen in smart city visions of a multi-layered information architecture, this directly effects the way we exercise our individual and collective freedoms.

IV. Commoning as Cultural Technique

Since ambient media confronts us with a new set of environmental concerns, we need to comprehend media both as a set of discrete technologies (subject to co-design, reappropriation, and collective governance) and a condition, changes in which call for a more comprehensive politics of sustainability. As core dynamic of such a politics, commoning can be understood as a cultural technique. The concept has been adapted from the domain of agricultural engineering to address processes of cultural constitution and counter the analytical tendency to explore the symbolic rather than the material (ontological) dimensions of culture [26]. As such, cultural technique offers a way to acknowledge the cultural, economic, and social registers of commoning and comprehend multiple articulations of resistance and resource governance.

Such a cultural technique is both hybrid in its adaptation of existing practices and perspectives, and distributed across different political forms and practices. Comprehending it in term of collaborative constitution, worldmaking, and a parametric politics, it can be developed along multiple vectors of activity.

A. Commoning as Collaborative Constitution

The less our interaction with a world of ambient media is based on prior knowledge, structured searches, and deliberate choices, the more our environments have to know about us, our location, our preferences, our histories of interaction: we are, by definition, not only on the terrain of discourse and deliberation but of experience, of affect, of sensation. Because the subjective economy of ambient media operates on the commons of our affective and cognitive capacities for communication, commoning engages the question of access to the conditions of subjectivity [27]. The ambient commons is not only about standards or technologies open to multiple forms of reappropriation, but about who we become when we communicate. Which is why, „if ‚commoning’ has any meaning, it must be the production of ourselves as a common subject“, as the practices of creating and recreating the commons necessarily involve processes of individual and collective self-constitution [28].

The concept of cultural technique resonates with philosophical accounts of the co-evolution (or co-originarity) of technology and the human [29]. These have become a point of departure for analyses of the physiological and psychological implications of the environmentalization of media [30]. To understand ambient media, we have to let go of concepts of agency as a capacity that is always already given and attend to the dynamics of subjective constitution – to the ways in which (ambient) media affect our capacity for cognition and relation.

Interfaces are experience architectures [31]. The valorization of “invisible interfaces,” a a major element in the environmentalization of media and an influential aesthetic principle, has far-reaching normative implications [(32), (33)]. Such design approaches focus on constraining (in the name of efficiency, freedom, and simplicity rather than control) the powers and potentialities of the “complete user” implied in the comprehension of computing as a general purpose technology [34]. Hiding the materiality of technical systems not only limits our capacity to use them in creative ways. It also regulates access to the very means involved in our individual and collective self-constitution.

This is not to deny the effects of empowerment through design, or to automatically attribute political prescience to (bad) design decisions that yield unexpected or unwelcome outcomes. But we need to explore the aims and agendas of such empowerment and expectation. An increase in individual freedom (especially if pursued by following the rather limited freedom model of choice) is not necessarily accompanied by an increase in social freedom: the freedom to have a say regarding the nature and number of choices available, the freedom to be involved in processes of collaborative creation. So instead of imagining ambient media as a seamless space of frictionless communication, we imagine it as a bordered space of conflict [35] and recall that what is cast as friction in visions of “frictionless capitalism” (Bill Gates) or “frictionless sharing” (Mark

Zuckerberg) is the conflictual dynamic engaged by commoning strategies. The enjoyment of rights to public goods, to the city itself is only possible in common [36]. To think design only in relation to individual freedom makes this commonality disappear as a „matter of concern“ [37].

B. Commoning as Worldmaking

By way of historical analogy and to draw attention to the link between insivible design and the mediation of labor, we might say that a commoning of interface design strategies is to “invisible design” what experimental film is to continuity editing, i.e. the disappearance of the work and workings of montage. Whereas seamless invisible design makes work (and with it alternative forms of agency and expression) disappear, the seam can become a potential site of critical engagement - “seamful” rather than seamless design [38].

Above and beyond its mobilizations in ubicomp contexts, the organic idiom of seams links to the processes of becoming-topological across algorithmic cultures, from the “fabric” topologies in software-defined networking infrastructures [39] to the “folding” of citizens into smart city systems [40]. As a mining term, the seam also relates to the geological registers of sustainability-focused reconceptualizations of human agency based on the designation of our era as an “Anthropocene” characterized by the consequences of human activity [41]. Finally, it refers back to the extractivist dynamics (data mining, sentiment analysis) of the subjective economy. At the affective and cognitive seams of the subjective economy historical forms of commons-based resource governance connect to the commoning of ambient media.

Any new politics of sustainability calls for a new (or renewed) concept of the environment. Almost two decades ago, James Boyle suggested reinventing „the commons“ as a shared point of reference to bring about a convergence of info-political initiatives comparable to the way the then-novel notion of „the environment“ had succeeded in consolidating ecopolitical efforts in the 1960s [42]. The idea of depletion design is both a concrete set of design strategies and an attempt to establish an architecture for commoning that situates and affirms our individual and collective agency under the conditions of mediation. While ambient media is a rather recent development, we are already aware of its ecological and social costs: natural resource exhaustion, increasing energy use, rebound effects of mass consumption that outpace any efficiency gains, new waste streams, occupational health and safety concerns across supply chains and workplaces, and the need for sustainable design – all of which have been the focus of electronics activism [43]. The focus on depletion links attention to these concerns with the ways in which the socio-technological systems of new media ecologies transform and threaten to exhaust our capacities for relation and reflection [(44), (45)].

Commoning cuts across and couples ecologies, not least because in our experience they already flow together. Rights to informational self-determination or privacy and rights to non-toxic technologies, for example, are not exercised in different worlds. Their separation is not a given but an effect of governance by different epistemological and political regimes - concern over climate change notwithstanding, we continue to analyse and govern “the economy” and “the environment” by separate institutions.

Commoning has existed long before research and policy started to selectively appreciate citizen’s resistance and resilience to the imposition of new forms of government and governance as a form of social innovation [46]. A focus on the enclosure of the ambient commons broadens the horizon of analysis beyond the digital society and the short history of ambient media, linking contemporary practices of commoning to the archive of historical practices of self-determination and collective governance [(47), (48)].

While commoning has been a powerful historical current, analyses have only occasionally acknowledged and explored the coloniality [49] of this tradition, including the controversial role played by (settler) commons [50] but also the campaigns for a New World Information and Communication Order that accompanied the processes of decolonization and inspired contemporary campaigns for citizen-driven infrastructure governance [51]. The history of these conflicts and their contemporary resonances help translate ambient commoning from a local dynamic into the translocal terms of infrastructure analysis and governance. Rather than addressing only national or international actors, ambient commoning is an exercise in „extrastatecraft“ to engage with the distribution of governance across multiple registers [52].

The shared history of commoning is also one of the sources of identification for a (post-national) sense of citizenship. Whatever their differences, people across the world have expressed deep and shared concerns regarding the implications of ambient media developments. Beyond any “internationalism” that comprehends these commonalities only in relationship to the statist categories of national belonging, such concerns indicate a shared sensibility that no longer foregrounds or fetishizes the act of border crossing but takes the distribution of human agency across a wide terrain already as point of departure. It seems that rather than experiencing ambient media as a discrete set of tools, we have already learned to live and think within its environmental horizon. And we already know there is no outside: all consequences of our actions remain in the same space of shared experience.

The ambient commons not only suggest new cartographies of this shared space, beyond the social geometries of state, market, and civil society. It challenges the spatial imagination of our sense of the political. Following “the incorporation of topography into topology,” as “the second nature of build form is subsumed into a third nature of standardized mediation,” ambient media infrastructures have already been described as “post-political” [53]. It is yet unclear whether we can expand our sense of the political to include the kinds of engagements needed to shape these environments. Design will be a part of it - at least if,

beyond a narrowly defined aesthetic practice, design becomes a strategy of worldmaking, imagining „total configurations“ [54] that cut across processes of technical and subjective constitution.

C. Commoning as Parametric Politics

The age of ambient media is by no means an exclusively urban phenomenon, quite the contrary - one of the main consequences of ambient media is the levelling of differences between urban and rural, or at least semi-urban territories. Accompanied by the rise of ‘smart city’ frameworks, the city is still the main site where new visions of informatization are implemented.

The link between urbanism and computing is much older than the visions of infrastructural informatization in the digital society. Historically, the city is not only a medium, the city (as address space or routing system) is the model of computational organization [55]. A comprehensive imagination of these infrastructures as dynamic system brings into view the protocols and parameters that define their operations [56]. This can mean building on maker and design thinking approaches as well as embodied cognition research for hands-on methods to imagine and co-design new interfaces that can operate as sites of commoning and commons-based production, but also the codes of new currencies aiming to reorganize the distribution of wealth [57]. In the sense of commoning as a cultural technique that links actors and objects in new chains of operation, to engage in remaking this world of ambient media is to envision a redesign of its operational infrastructures.

Attending to the „seamfulness“ of existing urban infrastructures (taking out copper, putting in fibre), we can better appreciate the normative implications of the call for invisible interfaces. A construction site maybe a nuisance, but it is above all a reminder of the need to access existing infrastructures in processes of reconfiguration. The distribution of power lines and the location of power plants have already been focal points of political contestation, suggesting that whenever infrastructures become visible, they also become graspable as potential objects of a politics [58]. Such terrains of common experience are a reminder of the direct link between shared use and infrastructural design. For many, life in the city has meant the enjoyment of urban commons like pedestrian areas, play grounds or public parks; more recently, commons research has begun to elaborate commons-based approaches to urban governance [59]. And while the scope of ‚smart’ citizenship is also determined in relation to the possibilities of a reconfiguration of urban spaces, ambient commoning in a more comprehensive sense also connects a free wifi zone, or more generally the geography of a „sentient city“ to the datacenter distribution of ambient media systems.

Yet part of what it makes it difficult to comprehend contemporary urban systems is the notion of the digital itself. The notion of the digital society, for example, is useful in calling attention to the distinctiveness of the computational conjuncture, of the ways in which the conceptual and operational logics of computation affect cultural, economic, and social processes. But the digital may be misleading if it limits our attention to a comparative account that not only revolves around the analog/digital divide, but seeks in the affirmation of the analog a politics to address the shortcomings of the digital. The positive effects of offline pleasures notwithstanding, a comprehension of culture and nature as distinct ontological spheres makes it difficult to grasp the environmentalization of media – of the technicity of our being-in-the-world, of the key role played by technology in making us human, and of the ways in which the rise of ambient media affects this humanity by determining our capacities for cognition and relation.

Similarly, the replacement of the digital with „software“ offers only a partial solution - little is gained when a hardware determinism is replaced with a software determinism. However, attention to the semiotics of software, a key concern of software studies, facilitates the comprehension of the mixed semiotics of the subjective economy, an economy in which the a-signifying semiotics of machinic communication sustain the operation of semi-autonomous systems that redefine the scope and structure of human agency. In the context of ambient media, it makes perfect sense to ask: „What does it mean to be a citizen in the software society?“ [60]. So instead of focusing on the marginalization by the machine, ambient commoning develops the parametric rather than the representational registers of politics to address the mediation of agency.

Because attention to agency necessarily includes the transformation of labor, a parametric politics of sustainability must address both economic and environmental justice. It may come as a surprise that the question of labor surfaces in the conceptual outline of a new environmentalism. But the separation of the politics of labor and those of the environment, one of the consequences of our collective insistence on culture-nature distinctions, does not make sense in the context of commoning. The occupational health and safety of workers have always been linked to the pollution of sites of production, for example. In such contexts, „commoning“ includes the creation of rights to know, creating shared access for workers and communities to information about the toxicity of materials – key issues in the highly chemicalized processes of electronics production and disposal [61]. In such a context, the protection of production processes as intellectual property directly pits possible forms of social innovation that protect the well-being of consumers and workers (we need to know) against the technological innovation of a trademarked product (we cannot tell you). To find alternative solutions is a matter of urgency rather than simply the choice of granting a „sharing economy“ or „open innovation“ a niche existence in an economy of closed IP. Beyond open technology schemes in comprehensive maker and media literacies, such protocols and parameters (including export bans for toxic wastes and attempts to establish „fair“ value chains in electronics production) are on the agenda of ambient commoning.

A politics of labor limiting itself to the translation of productivity gains into wage increases will find it

difficult to take seriously the inseparability of economic and environmental justice. At the same time, labor organizations realize that the politicization of consumption (fair trade, organic food, ethical investment) has met with rather limited success in garnering support both among and for their traditional constituencies. One of the (few) benefits of the notion of the „prosumer," suggesting the simultaneity of production and consumption, is to draw attention to these linkages. Because they predate the digital society, they might help sustain commoning alliances that cut across the analog/digital divide that separates political milieus and organizational forms.

Beyond culture/nature distinctions, ambient commoning refuses the disempowerment of many „critical" anti-technology positions. We already suspect that the autonomous technical systems we are setting in motion are not governable, at least not by traditional forms of politics. The deterritorializing discharge from electricity gemeration and electronics production, for instance, not only cuts across the geographies of sovereignty - toxic dusts, flows, and seepages also remind us of the leakiness of our conceptual containers. To tease out the extent to which agency (and with it the possibilities of attributing responsibility) is currently being distributed across systems requires new knowledges, not simply of technical objects but of the processes of their computational constitution. A coding seminar will not (directly) put anyone in a position to regulate the subjective economy. But as we have seen, even the black boxes of algorithmic trading can not only be opened, they can be redesigned [62]. We are beginning to understand the operational infrastructures sustaining the lifestream logistics of stock markets and social media. Coupling the „episodic structure" [63] of design thinking with the speculative sensibilities of design fictions [64], we can now take this knowledge to design commoning architectures [65].

V. To Our Friends

For the philosopher Kostas Axelos, "Friendship towards technology – neither wanting to dominate it, nor submitting to it – is a present and future task" [66]. To imagine the ambient commons as a space of friendship seems less than ambitious, even naive, given the stakes of the global ambient media game and the inevitability of conflict. Friendship is not easily mapped onto the topologies of our antagonistic comprehensions of the political. It calls them into question [67]. It also reminds us that before commoning becomes a politics, we encounter it everday as an ethos. So why share? Because we already do – if only in the sense of distributing the consequences of our decisions across a terrain beyond the reach of any technology of the self. We have learned to embrace the technicity of our logics of existentialization, perhaps inspired by the conviction that if we can transform something into a technology (self-relation, for instance) it becomes governable. But friendship towards technology is not only a way to question that technicity and governability are inevitably and irreversibly coupled [68]. It is a reminder that even if all we want is a sense of the distribution of our own agency, we need to create technologies of the common. And once we have them, we can put them to other uses.

Acknowledgement

The conceptual and political idiom sketched here continues to develop in an ongoing conversation across multiple contexts. It takes seriously the idea that "we are our gestures" (Vilém Flusser) of speaking, thinking, and writing, and that whatever knowledges we create are immanent in specific social relations. So thank you all.

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