Doing Stuff with Stuff: Designing for the Everyday Metamorphosis of Collaborative Work Environments

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This paper unpicks a thread in the everyday logic of the novelty-seeking motives of emerging collaborative environments. Through a discussion of metamorphosis and mess, and boundaries of stuff we propose an understanding of the dynamic view of knowledge and the in-formation of design (viewed as the ambiguous and inarticulate 'doing stuff with stuff') as 'everyday metamorphosis' - a framework for appreciating how working with, rather than solving mess can play a role in collaborative work environments. The paper concludes by presenting an emerging experiment in everyday metamorphosis and briefly speculating how this might contribute to thinking about new socio-material collaborative models.

***Keywords**: Creativity; mess; everyday metamorphosis; collaboration*

1. Introduction

This paper presents early investigations of a longer-term research project to examine the stuff (inclusively as people, relationships, non-humans, objects, physical phenomena, software, spaces, and processes, for example) with which we work, interact, experiment or play in socio-material environments (e.g. Franck and Stevens, 2006; Galloway, 2007; Nicholson, 1972).

Broadly, the project asks:

What role does all the 'stuff' around us play in generating or inhibiting new ideas, relationships, progress, change and/or unexpected directions in our collaborative work?

This discussion is founded in an interest in the ways in which objects and practices co-evolve (Shove et al., 2007), the rhythmic, temporal and story-

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like nature of stuff which positions it 'at the confluence of actions and responses' (Ingold, 2011, p. 154), and the improvisatory capacity of people in their everyday environments (Brandes et. al., 2009). The purpose of this paper is to begin to unpick a thread in the everyday logic that can be derived from the novelty-seeking motives of emerging collaborative environments (spaces starting with 'co') such as co-work spaces, transdisciplinary collaboratories and everyday 'working together'. Through a discussion of metamorphosis and mess, and boundaries of stuff we propose an understanding of the dynamic view of knowledge and the in-formation of design (viewed as the ambiguous and inarticulate 'doing stuff with stuff') as 'everyday metamorphosis' - a framework for appreciating how working with, rather than solving mess can play a role in collaborative work environments. Further, we present one of our emerging experiments in everyday metamorphosis and tease out three threads (simple alchemies; stigmergy; trance-like states) that can contribute to a developing model of collaboration.

2. Metamorphosis, Mess

2.1 The Magic of 'Co' (= Metamorphosis)

The value of inventiveness, creativity and the possibility of discovery is the inherent motive in emerging collaborative environments. The plurality and diversity of such environments are known to promote divergent processes, which are important characteristics of creativity (Basset-Jones, 2005). Further, a componential theory of creativity holds the environment as one key influence on creative output and the components of individual creativity (intrinsic motivation, domain-relevant knowledge, and creativity relevant processes) (Amabile, 1996). Thus, when concerned with increasing creativity of multiple individuals through collaboration the environment where they come together is important (e.g. Hamano, 2012). Research on the environment for creativity spans the social-psychological (e.g. Amabile et al., 2006), urban (e.g. Stevens, 2007), and spatial (Sailer, 2011), for example. Such literature seeks to articulate aspects of the environment in the pursuit of understanding and increasing creative outcomes but attempts at working with (as opposed to solving) the inarticulate intermediate aspects of the processes at work in these environments are still rare. Media reports and everyday accounts of spaces starting with 'co' also show a lack of reflection on such aspects (not to deny that the success of many of these places illustrates an understanding of these issues) - for example;

'...put smart people around other smart people in collaborative spaces 'where magic can happen'. 'A developer ends up sharing an idea with a marketer. They decide to start up an enterprise, and bam, you have another great collaboration built naturally around relationships.' (Ken Erskine, quoted in The New Zealand Herald, 2014 - on Auckland's new Wynyard Quarter innovation precinct).

Similar to a From-To Poetics (Guggenheim, 2011) that describe a kind of magic in the built environment where the start and end states (absent process) account for changes in use – these invocations of the magic of 'co' take us from co-presence to innovative collaboration with a lack of analysis of the fine-grained aspects at work on an everyday level. This is a metamorphic representation of collaboration which views environments in distinct and discrete forms, each of which are substantially perfect from the beginning – for example, the birth of a butterfly, the opening of a new urban development, a productive meeting with a stranger, or the birth of a new business venture (see e.g. Baumann, 2000; Wiener, 1954 on metamorphosis). Change presented in this way is a radical (magical) transformation which in fact has 'no intrinsic capability of growth' because it leaves little room for memory (Wiener, 1954, p. 54).

The loss of memory is a loss of knowledge (Stiegler, 2010) and as knowledge and skills are a necessary part of an individual's capacity for creativity (Amabile, 1996; Amabile et al., 1996; Boden, 1994) memory loss impedes the ability to dig deep and venture forth into the unfamiliar in the pursuit of experiments with the elusive and the uncertain (e.g. Sennett, 2006; Tuan, 1977). Lacking the ability to explore the unknown, we can make the mistake of believing that we reside in a situation with no unknowns (Yoshikawa's metamorphic 'ideal knowledge design situation') where we have perfect knowledge about functions, attributes and how to put them together. In such a case, design and designers disappear, our work goal becomes pure optimization (Hatchuel and Weil, 2003) and as a result the potential for unexpected and valuable outcomes diminish. In contrast, a Concept-Knowledge Theory (CKT) approach to design defines the unknown (a Concept in CKT terminology) as essential and thus views the knowledge expansion process (the generative interplay between known and unknown) as central (Hatchuel and Weil, 2003; Kimbell, 2009).

In working with novelty-seeking collaborative environments then, it is necessary to move away from a metamorphic view which posits perfect knowledge within definite moults (stages) and move towards a dynamic, incomplete and messy view of knowledge.

2.2 Mess

'Everything we design and make is an improvisation, a lash-up, something inept and provisional' (Pye, 1978, p. 14). We encounter, create, and dwell in mess, making 'wrong moves, false starts, dead ends' (Sennet, 2008:161), while working with the existing in acts of 'modification, conversion, and adaptation' to give form to ideas (de Freitas, 2008, p. 7). Working with incompleteness is a form of bricolage (e.g. Levi-Strauss, 1966), where goals are pursued through arrangement and rearrangement, negotiation and renegotiation, in a 'collaborative venture' or 'conversation' with the materials which is contemplative and considers missteps as part of producing new ideas (Turkle and Papert, 1991, p. 169). All knowledge involves some degree of bricolage (Scalbert, 2011). People do not draw solely on existing individual knowledge (explicit and tacit) when engaging in activities, they draw upon collective knowledge (whether they are aware of it or not) (Tsoukas, 1996) and have a capacity to create new knowledge (Nonaka, 1994). It is when knowledge is constantly undergoing change that it possesses the greatest power (Nonaka, 1994). In this view knowledge is 'essentially active' (Piaget, 1968). Flusser's example of the evolution of the pot (from cupped hand to fired ceramic) illustrates this dynamic view of knowledge in an intimate way, showing how human knowledge shaped by tacit knowledge and codified into explicit (or structured) knowledge 'must on occasion be up-ended to expand our knowledge base' (Henry, 2007, p. 2).

2.2.1 Doing Stuff with Stuff

To talk in this way is to recognise the dynamic aspect of knowing - the verb rather than the noun. It is to focus on the act of creating (poiesis) which can be learned, rather than the object, which cannot (Carse, 1986), and to turn an eye towards concrete modes of thought where the mind uses objects to think with in a 'dynamic relationship' (Turkle, 2007, p. 9). Doing stuff with stuff is thinking that we can touch, take apart and leave around. This kind of knowing involves more than just thinking and reasoning, it involves ways of doing, acting, communicating, interacting and negotiating (Lawson, 2004). Humans are Homo Ludens (at play, e.g. Huizinger, 1955) and Homo Faber (at making, e.g. Gatt and Ingold, 2013). Playing through ideas and thinking through making (Philpott, 2013) shows that what the maker pursues is 'sufficiently clear to be perceived but sufficiently unclear... to deserve to be pursued... ' (Tin, 2013, p. 5) (i.e. incompleteness and the unknown). In short, to do stuff with stuff is to know it, and to know stuff is to continue to do stuff with it.

3. Boundaries of Stuff

'Machines, products, tools… prosthetics… applications, programs, interconnections, energy and information flows… laws of circulation, boundaries, necessities, designs, logics… accidents, mechanisms, exertions…' (Preciado, quoted in Eckert, 2011, p. 61). 'Cat Hair, Beetles, Brillo Pads… Viagra, Jelly Beans, Pubic Hair, Curry Powder, Metal Screws…' (Bardini, 2011, p. 8). There is a lot of stuff to 'appreciate' (Mol's 2010 term) in the expansion the knowledge space, which is not surprising given that mess invites 'a wider set of relationships into the collaborative ring' (de Freitas, 2008, p. 6).

To begin to make sense of all this stuff an understanding of boundaries is helpful (Galloway, 2007). We take from Gibson (1979) the viewpoint that substances are physical foundations for life that can't be moved through and that surfaces (the interface, what bodies touch) that separate them are where 'most of the action is' (Gibson, 1979, p. 23). From American metaphysician Paul Weiss we see that '[t]he key to understanding space lies in [the] mutual resistance between diverse individuals [and that] shared public existence, and any of its parts, can be thought of as a kind of boundary, a union and a division' (Miller, 1987, p. 84). All boundaries have a certain thickness, but every part of the stuff we experience melts into its neighbours, resulting in a 'continuum of filter-like boundaries' (Miller, 1987, p. 85).

We can view this situation in terms of conjunction and connection.

Conjunction is 'the meeting and fusion of rounded and irregular forms that infuse in a manner that is imprecise, unrepeatable, imperfect and continuous' (mess) and connection is 'the punctual and repeatable interaction of algorithmic functions, straight lines and points that juxtapose perfectly and are inserted and removed in discrete modes of interaction' (metamorphosis) (Berardi, 2009, p. 131). The conjunction-connection distinction resonates with Anusas and Ingold's (2013) analysis of a Western industrialized design that increasingly separates the myriad workings of things (infrastices) from surfaces, which must then be breached in order to connect and be used with other things. Similarly, Ingold (2009) perceives this dichotomy in terms of lines versus dots; a view of knowledge derived through a journey or practice rather than abstracted from discrete data points.

In a world trending towards the seamless (in e.g. product design and collaboration), connections do not produce seams or scars (see e.g. Galloway, 2007), meaning that a tendency towards the connective and

seamless is a tendency towards '*a design*' as an isolated material thing that obscures complexity and interrelatedness through the metamorphic 'plugin'.

On the other hand, '*design as a practice*' that can enable richer dialogue between people, materials and surroundings (Anusas and Ingold, 2013) displays a more conjunctive tendency. Here, the process may be illegible, inarticulate and unpredictable but has the potential to possess qualities which may foster knowledge expansion through their at-ease-ness with the unknown. This distinction does not deny that connective modes 'work' or posit that conjunctive modes might work better in the context of current success metrics. Appreciating the conjunctive mode does however help us to move focus from the author (as connector agent) to the environment (as generative architecture) (e.g. Hamano, 2012). Secondly, making the linkage between the surface characteristics of stuff and the qualities of design and knowledge that they imply highlights the importance of appreciating the intertwining of the various stuff that we do stuff with (e.g. Ingold, 2011).

4. (Everyday) Metamorphosis and the Collaborative Work Environment

We have followed a thread that started by noting that novelty-seeking motive of spaces for collaboration can be viewed as the motive to design, which in turn necessitates knowledge generation. As opposed to consecutively perfect metamorphosis the model we scratch out is a messy and fluid (but navigable) environment where memory and learning are founded on a degree of continuity. We call this an everyday metamorphosis (in a nod to Brandes, Stitch and Wender, 2009's inspiring work on creative reuse, stuff, and design).

'Everyday' points to the rhythms of the human worklife. We use it to emphasise the non-goal oriented aspects of the 'bringing forth' of production setting the 'verb 'to produce' alongside other intransitive verbs such as to hope, to grow and to dwell, as against such transitive verbs as to plan, to make and to build' (Ingold, 2011, p. 6). In short, by setting the overarching goals of work in the background we hope to bring the fluid aspects of the everyday to the fore.

We retain the word metamorphosis to highlight that we can in fact perceive changes and parts in the 'entangled mesh of materials in energetic movement, out of which the forms of things are continually emerging' (Anusas and Ingold, 2013, p. 66). Recognizing degrees of privacy enables us to distinguish between the table and its subatomic constituents (Miller,

1987), the website, the myriad hyperlinks, and the source code, or the mud pie and the grain of sand, for example (note that the degrees that we can perceive and act with depend on our knowledge expansions). This viewpoint helps us retrieve the interassociations of stuff (including us) from a sea/compost that we dwell in, in the hope that we can reoperationalise them for theoretical and practical uses.

4.1 An Experiment in Everyday Metamorphosis in a Collaborative Work Environment

In the following empirical account we outline a recent experiment by Auckland-based artist/researcher Xin Cheng and a co-author of this paper, Chris Berthelsen. This was an attempt to savour the simple pleasures of practical experimentation with resources at hand and the environment as given, and consider circumstances and eddies, niches and leftovers, material intrigue, spontaneous constructions and rearrangements, sustenance and pleasures of the senses. We briefly outline the work/environment and then discuss aspects of everyday metamorphosis that it highlights, teasing out future directions for investigating new socio-material collaborative models. Following Kilbourn (2013) we focus on the experience of carrying out the activities. Rather than descriptive, in this section our purpose is generative - to imagine design opportunities.

4.1.1 making-do[1]

As part of the public programme for Artspace - the 'leading non-collecting, non-commercial organisation for contemporary art in New Zealand' (Artspace, 2014) - making-do is a series of four 4-5 hour walks, a 3 hour workshop, and an ongoing publication/installation.

The project description explains:

'Having a conversation with the junk of a City of Riches feels surprisingly cosy. And inspires intense concentration.

With a makeshift trolley of tools and resources in tow, Xin Cheng, Chris Berthelsen and companions become hypnotized by the fine-grain of Auckland's native wetlands, urban industrial zones and sub/urban deathtraps. Over a series of walks they begin to work out how to come to terms with the Super City in a pragmatic, generative, and non-goal-oriented manner.' (Cheng and Berthelsen, 2014)

1 The following sections include text written by and/or in conjunction with Xin Cheng (http://xin-cheng.info) but the responsibility for any errors remains the author's.

With various companions (we prefer the term to participants as it evokes a closer, more convivial relationship) we embarked on half-day walks where we were not afraid to 'see what happens' (non-goal oriented) and enter into material dialogue with our tools, resources and the environment as given. Rather than an exercise in guerrilla, or tactical urbanism we viewed this as an opportunity for experiencing how unknown and incomplete stuff at hand can be perceived, form and be worked with, and to explore what we can learn about ourselves and others (Galloway, 2007) in the process. An online sketchbook of the walks (http://md.making-doing.info) helped us and companions share sensemaking and speculation about aspects of the walks in an asynchronous and fragmented way, creating a shared yet ambiguous starting point for the workshop. The workshop consisted of (1) a one hour session attempting to make various mobile storage devices from various stuff we had collected over the walking tours, and (2) a two hour walking tour throughout the Auckland CBD. Willing companions were (1) Advised to bring a plastic bag and wear comfortable clothes and (2) Invited to bring a light item of junk from home and some simple snacks to share, but were given no other prior directions. Companions (in person and those who joined in asynchronously throughout the work) contributed to an ongoing publication which was launched at a local zinefest and is a DIY bookbinding installation at the Artspace reading room.

4.2 Aspects for Everyday Metamorphosis

Reflecting on the above activity we identify three conjunctive characteristics that help us clarify the everyday metamorphosis of the collaborative work environment (Figure 1): (a) simple alchemies (engrams), (b) stigmergy, and (c) a viscous fluid (trance-like states). They offer directions and pose questions for practitioners seeking to appreciate the everyday metamorphosis of collaborative work environments.

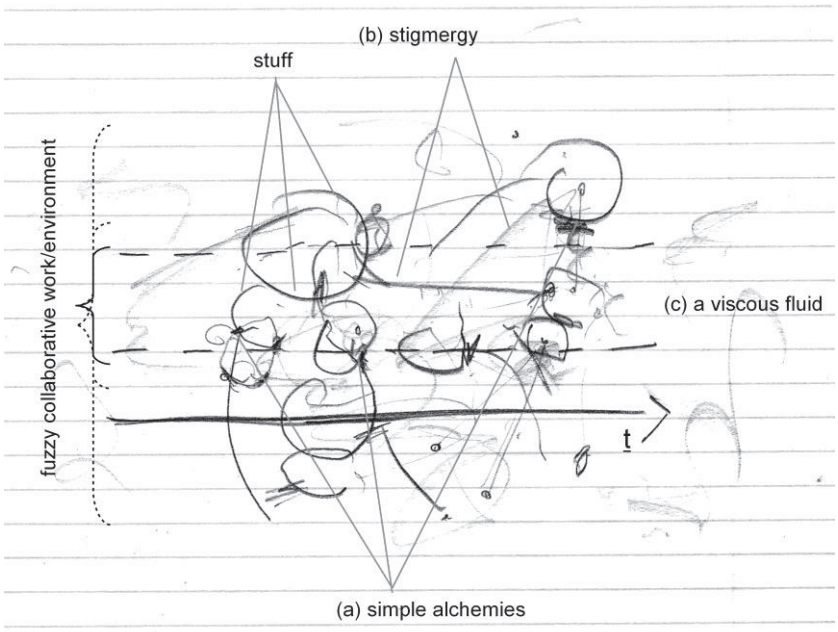

Figure 1 Everyday Metamorphosis.

4.2.1 Simple Alchemies (Engrams)

Seaweed, a self-seeded loquat tree and a backpacker from Chile combine for a memorial to a recently deceased father; Sticks become footholds and hammers; Puddles are painting palettes; Vines and inner tubes are fashioned into playthings. These are our simple, cheap and disposable stuff (our 'loose parts' – Nicholson, 1972), and their mis/reuse is a localized swelling (node) of combination (the knots of Ingold's (2009, 2011) meshwork). They constitute engrams (traces and fragments of action left in the environment) that can influence (in ways from practical ideas, to conflict and feelings of permission) the actions of ourselves and others and contribute to the continuing transformation of the environment through a process of stigmergy (see below) (e.g. Camazine et al., 2001).

We like playing with trash, but simple alchemies are not restricted to the household variety noted above. Knowledge relativity and degrees of privacy imply that simplicity is dependent on both our domain-specific knowledge of it and at what degree we can (or wish to) perceive it at. Skilled practice (Ingold, 2008) and the context dependence of creativity/ technology

(Resnick, 2006) mean that the category of simple can include all open systems. For example, the programming of computers involves a more concrete and personal relationship with materials than its social construction would have us believe (Turkle and Papert, 1991) and as complex machines make some skills obsolete they concurrently become grounds for new communities of practice (Ingold, 2011). Simple and effective alchemies prove to be generative and ad-hoc experiments in diverse interactions of open stuff.

4.2.2 Stigmergy

Realising that an effective broom can be fashioned from cable ties leads to discussion of gentrification and the precarity of local government employment; Potholes and cracked stormwater drains provide jump-off points for an investigation of public safety structures; a mutual interest in tyres spawns a productive partnership. Here, we experience how knowledge transforms through letting effects emerge (see e.g. Turkle and Papert, 1991) to mold both reflexes (discrete action) and behaviours (learning) (see Wiener's (1954) discussion of feedback). The simple nature of our alchemies enables fast feedback which relates to immediate use-pleasure and flows and stocks of knowledge. Both the materials and environment, and the skills and repertoire of our companions develop. The question is not how to create new stuff that is easier to work with. It is up to (and the pleasure of) the companions to discover new ways of fruitful interaction with materials-at-hand. This is a view of creativity that favours improvisation as opposed to innovation (see e.g. Gatt and Ingold, 2013). It is a stigmergic perspective where copresence nurtures a process of collaboration when individuals communicate (not necessarily knowingly) with one another by modifying their local environment (Elliot, 2006). Galloway (2007) encourages us to view these modifications as sources of knowledge about how we live with the stuff in our world. Like Certeau's footsteps - '[t]hey are myriad, but do not compose a series… [t]heir intertwined paths give shape to spaces. They weave places together' (1984, p. 97) in lines of knowledge expansion (e.g. Ingold, 2009). Understood this way the generative function of the environment can be perceived. Our doings with stuff become decreasingly discernible in their original form over time and are of varying permanence as scars form and cracks rupture. Legibility runs a spectrum from finished product to fragments, remnants, traces, and raw materials. This process shunts authorship from observable through a spectrum of memory that ends in the author being forgotten or indiscernible. When no definite

records remain, questions of privacy and surveillance become muted and archiving depends on the individual memories, and care and preservation (see, e.g. Hui, 2013) in loose understandings with stuff.

4.2.3 A Viscous Fluid (Trance-Like States)

Walking all day through industrial estates in the rain; Napping on a berm to the cackling of weed smokers in a nearby house; Zoning out in front of a stew of beans. These trance-like states are the viscous fluid which greases our everydays. They quieten the chatter in our heads, make space for unexpected connections and fuzzy digressions that we have seen reappear in our subsequent work and collaborations.

To value such trance-like states is to be open to the 'generative and provocative' reframing power of the experiential (e.g. Kilbourn, 2013, p. 70) and to follow Oreton's example and '…revel in our fieldwork as an activity saturated with sensory, corporeal experiences…' (Oreton quoted in Bain and Nash, 2006, p. 100). In light of the psycho-cognitive mutations and mental suffering that Berardi (2009) delineates this aspect may be one of the most important. It opens a crack in our worklives for deceleration, demobilizing productive energy, and thus savouring the pleasure and meaning in work experience. A viscous fluid cannot connect. Rather it is a caress and envelopment that seeps into cracks and seams, providing a mucus terrain for the uncertain conjunction and thus collaboration of stuff.

5. Conclusion

The longer-term objective of this research project is to experiment with the material and becoming aspects of everyday metamorphosis in continual knowledge expansion in collaborative environments. We have outlined a perspective which values the conjunctiveness of the stuff around us as an important part of the design process in terms of the way it allows for mess and the dynamism of knowledge. In the context of this paper we have noted three aspects for further consideration. Some things that we now pursue in design experiments (including public park design, site-specific installations, and community-based learning collaboration) include: How might we operationalise the simple alchemies of stuff in a coherent way for developers, managers and inhabitants of spaces starting with 'co'? In an increasingly mobile and computery work environment how can the concept of stigmergy be leveraged in virtual and physical ways in the support of knowledge expansion? Are trance-like states of the sort we mention only

accessible to the unemployed, students, artists and parasites? And will we be able to convince middle managers of value that we perceive in them?

Notes

In the spirit of this paper we are always open to suggestion. Please do not hesitate to email us.

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