Chapter 12: Trusting Oneself: An anthropology of digital things and personal competence

Richard Harper and William Odom

Preamble

Several of the prior chapters in this book allude to the work of Harold Garfinkel and his seminal Studies in Ethnomethodology (1967). One of the great lessons that one can take from that book is the idea that society is made up of people who 'do' sociological theory or, rather, people who construct and deploy 'lay-sociological theorising' to both interpret and organise the world about them. Their everyday reasoning is a form of sociology Garfinkel would have us believe. Today, of course, the idea that people theorise in this sense, that they reason sociologically, has suffused itself throughout the discipline of sociology and its cognates. Take De Certeau (1984), for example, or another sociologist of the quotidian–Lefebrve (2004). Both argue that the social world is constructed, 'enacted' through the deployment of interpretative skills and agency–through people's capacity to reason in particular ways. Consider other social sciences, too, such as anthropology. Here Tim Ingold (2011) argues that people construct their places of dwelling through conscious acts of 'dialogic engagement': they attend to, work with, and reflect upon the things and persons around in ways that directs them in new trajectories, lines of action. All of this is a form of reasoning, Ingold claims.

The subtle differences between these various views notwithstanding, that people reason in a way that can be characterized as sociological, and that, as a result, the thing called society has the shape it has, is virtually a commonplace in contemporary thinking. The word theorizing, however, has been ameliorated with alternate formulas by these (and other) authors. We have just listed some of the alternative words and phrases used: people enact their reasoning, they rationally engage, their reasoning is part of how they produce dwellings. These and other formula stand as proxy for theorising. One of the motivations for using alternatives is that many commentators, including those just mentioned, would appear to prefer keeping the term theory as a label for their own thinking rather than as one applicable to the non-professional. To put it tartly, this move allows them to valorize what they do while giving lay person's actions a more prosaic, less consequential air. More seriously, it is perhaps correct that a distinction is made between the nature of reasoning in the real world and what is evoked by the term theory and its natural provenance, in the world of science. In this latter world, the term labels something that a scientist might conjure and then test against evidence. A theory in this context is a hypothesis,

say. Given this, then if one were to use the term theorising for lay reasoning, one might be led to believe that lay reason is like a form of science and that the theories it holds are testable, revisable. And, if one goes along with this then it is not such a distant move to also accept that such reasoning is bound to be weaker than true scientific reasoning–lay people are not trained, they do not have scientific tools, etc. In this view, everyday reasoning is poor science. As it happens this is a conclusion often reached in cognitive science and variants of psychology. One thinks of the Churchlands (1984; 1989).

This is not at all what Garfinkel had in mind when he argued that people theorise or do sociological reasoning. Though one might accept in hindsight that using the word theorizing is not helpful, highlighting as it does a contrast that distracts, Garfinkel's real insight was that everyday reasoning is a practical affair: it is most emphatically not a theoretical business. As Garfinkel remarks throughout the Studies, though lay people might like to theorise, they cannot do so without jeopardising their ability to get on with their real world concerns. These affairs are manifold, varying according to context and topicality and are constitutive of the diversity and richness of what people do and the practical concerns that confront them. Careful examination of these practical affairs will show, according to Garfinkel, how they are worked at, developed, made sensible and directed in some instance through the elaboration of practical reasoning–a kind of situated, accountable logic. That was what he meant; not that theorising was like hypothesis testing where the idea in question has a particular relationship to evidence and proof. Rather, lay theorising is reasoning in action.

Consider Garfinkel's illustrative example in Studies: the ways that coroners have to determine how the bodies they are examining end up where they are. Garfinkel characterises coroners as 'theorising' about these dead bodies since the coroners ask such things as, 'how did these bodies end up here, on the slab in their (i.e. the coroner's) office, at this moment in time?' They answer this question, Garfinkel explains, by invoking known or self-evident facts that can become a resource to let them start understanding what they see before them. Use of these in turn lets them refine 'the facts'–that facts that pertain to this case. But these facts are also used in particular ways, in ways that fix them or align them to the world known in common. One such fact is that a body in question is, say, young, visibly and thus evidently so–as in anyone can see this. The fact itself is thus made or treated as a common fact. Another is that such a body, a young one, would not 'normally' end up this way–dead. Young people don't die in the normal run of things. Old people do. 'Everyone knows this', the coroners say to themselves, 'Thus this is the kind of fact I can use'. The coroner tries to construct a set of circumstances that might have led to this premature death–foolish drinking and fighting, say, abusing drugs. The way they construct these scenarios is in accord with what they reason is sensible, accountable reasons that any normal person would agree to.

This is evidently not like the theorising of a scientist. It is a kind of theorising but its constraints and its manner of use are quite particular. To begin with, in this theorising, relevant data cannot be selected through methods. The relevant data is whatever is at hand. The coroner has to imagine what kind of circumstances would lead to such an unusual end with only the evidence before him or her. They cannot ask to do another experiment, another run through. The evidence they do have is itself of a particular, real worldly character. They don't confine themselves to data produced by pure method or means. They use reasonable inferences based on what they know is the world they live in. Garfinkel proposes calling this reference to the world known in common as the documentary method of interpretation. In this regard, one might say that the theory, at the beginning of the coroner's work, does look like a theory that a scientist might use–something to be tested, altered. What is different is that eventually whatever the coroner comes up with has to stand up to a court; it has to be the truth. Truth here does not mean scientific truth, it means given the information at hand, given what is reasonable.

This is where the distinction between science and practical reasoning is most stark. The important distinction is not that practical means imperfect, however. In a sense it is the other way around. For the constraints on practical reasoning make it, in some ways, harder than science. Scientists might object to this formula; the point is to highlight the kind of difficulties confronting people in the real world. Practical reasoning can entail work; it can be demanding. Garfinkel shows that this reasoning is not abstract or obtuse; it is grounded, reasoned, sensible, evidential. Above all, and this is key, it is accountable–it is the kind of reasoning that can be seen as sensible, apposite and practical–given the circumstances. In the case of the coroner, accountable to a court. In other circumstances, the accountability will be of a different form–in the production of organisational records, for example, the accountability will be of a kind, in the case of sexual identity it will be different too. It is the diversity of accountable circumstances that Garfinkel emphasises in Studies in Ethnomethodology.

The value that accrues when one looks at social action in this perspective is that it leads one to see how reasoning is bound to place; to practical affairs not in some general sense, but in some real, local, situated sense. Other sociologists, working at a similar time as Garfinkel (the late Fifties and throughout the Sixties more or less), also drew attention to this phenomenon: to how practical reasoning is bound up in real world affairs. Aaron Cicourel's studies of juvenile crime (1967) showed how police theorise about how kids end up doing crime not in some general, caricaturing way but in reference to real world situations. These techniques of reasoning sought to locate the behaviour that police officers were confronted with, within a broader canvass of typical conduct that allowed those police officers to make sense of that behaviour and thus make reasonable, accountable decisions about how to deal with it. In broad terms, these theories took the form of a set of maxims–that teenagers drive too fast, for example; that boys show off; that

most kids end up being good folks while it is only a handful that don't, etc. Through reference to these schemas, police officers were able to make judgments about how any particular instance was to be dealt with. Their dealings in any one instance allowed them to develop this reasoning, making it an ever more powerful and refined set of practices; commonsense skills if you like, skills required to let them work professionally. Similarly, Egon Bittner showed in his own articles on police work, how, for example, police officer's 'commonsense knowledge' of different areas in cities develops and refines itself and allows them to make more nuanced interpretations of conduct to be found in those areas (19671,b). In another, related study, D.L. Weider showed how inmates and staff of a halfway house reasoned about loyalty, trust, and favours owed through reference to a commonsense construct called the convict code (1974).

Practical reasoning and trust

Garfinkel was not alone, then, in highlighting the way people reason in practical contexts. Though obviously much of what police officers and coroners undertake does pertain to questions of trust, what we have been focusing on does not seem too concerned with that. Indeed, we do not want to draw on that aspect. The connection we want to draw between these arguments and the ones central to this book have to do with reasoning. For it turns out that many of the debates about trust turn around what is understood as reason.

Taddeo, for example, argues in various papers (2009; 2011) that one needs to specify the criteria used by an agent to determine whether to trust another. She claims that it is best to approach this task not by looking at how people make such decisions in real contexts of action, but by looking at what criteria are used when not infected by 'economic, attitudinal and psychological factors' (2011: p76). She proposes analysing the rational decision making of autonomous computational agents which stand as representative, she contends, of some kind of Kantian ideal of human reason–a pure form of reason, unsullied by practical affairs. One output of her analysis is the claim that trust is not a first order property of interaction; it derives as a second order feature. Agents ascertain whether they can depend upon another and then act accordingly. Their actions produce situations of trust thereafter. Trust is not a starting premise of action, then, but an outcome. In her view, the way that reasoning occurs is rather like the picture conveyed when the word theory is used: evidence is sought, a judgement is made, trustability can be seen or not. A hypothesis ('they are trustworthy') can be tested with an act: the other did behave as predicted, they did not; a trusting relationship does or does not follow on.

The contrast we want to make is not that Taddeo's form of reason is a reduced, clearer form of the reasoning Garfinkel characterises. The contrast as we see is in how different the stuff constitutive of Taddeo's reasoning is from the stuff constitutive of reason in practical affairs. In our view, they are not mirrors of each other, nor one a reduced form of the other; on the

contrary, they are very distinct, very different. Garfinkel's coroners would not look at Taddeo's agents and exclaim 'this is how I ought to reason', nor would they say 'If only I did not have to worry about all the extraneous factors–the psychological and the economic'. They would say 'What has this got to do with the world I live in? It would make no sense to render decisions in this way. The world I live in does not operate this way.' They would not see a reduced set of criteria, they would see a decision making procedure that would not work.

Of course this does not mean that Taddeo's view of reasoning does not fit anywhere, nor that it might have some specifiable relationship to more complex forms of reasoning. But often times the difficulty of making such links is, in our view, underestimated in discussions about trust. Besides this, efforts to do so are not always helped by some of the rhetoric that one finds in this domain. As a case in point, Taddeo uses phrases like 'reduced form'. This rhetoric induces the idea that even though some singular instances are being examined, somehow these stand as representative of all instances; that what is being sought for is a kind of scientific fact, a thing that is the reduced form of trust. This also occurs in the work of others such as in Gligor and Wing's *Towards a Theory of Trust* (2011) who compound that rhetoric with another, that of computationalism–the idea that all thought can be articulated through the structure of computer programmes. Here words like 'primitives' come to the fore–this is the elemental label in a computer language.

To take up a point from Watson's chapter, it seems reasonable to accept that there are 'participation frameworks' used when people reason about any task at hand, and there will be these in relation to computing as there will be to anything else. Such frameworks might also delineate types of engagement: to participate in a context where financial matters are afoot might be treated, framed as Watson prefers, as quite different from those situations where simple entertainment is the goal, for example. Indeed, we saw in Sasse and Riegelsberger's chapter that, in those situations that entail financial matters of some kind (or more generally some kind of security), then the orientation of those involved is of a particular kind. Participants in these contexts behave in ways that may be characterised as rational, when by that is meant that these individuals make judgements about what can and cannot be relied upon on the basis of the evidence at hand. Rationality here means acting in accord with signals of some kind.

Though the word rational is a good formulation of the reasoning in question, the claim that Sasse and Riegelsberger make is not that this is the universal basis of reasoning, its primitive or essential form; this is not reason that can be found anywhere. This is the kind of claim that Taddeo would appear to want us to accept. In contrast, what we learn from Watson and from Sasse and Riegelsberger is that this is simply a special kind of behaviour. To help draw out its uniqueness one might say it is calculating behaviour. This is suggestive that the reasoning in

question might be distinctive in ways that the term rational reasoning occludes; rational here being too all encompassing or just too vague. The kinds of reasoning often characterised as the basis of trust are then only an instance of reasoning, a form it can take. The kind that is most often used to illustrate this is the calculative reasoning we have just described, the one appropriate to, bound with, the real worldy contexts of, for example, e-commerce.

The judgement as to whether this form is essential to or more basic than and somehow more elemental than others is as we say too easily jumped to. Besides, and as importantly if not more so, the desire to make such a leap often distracts from other important features of the settings in which calculative reason is found.

There are at least four such features. First, this calculative reason starts from the assumption that questions of trust are in doubt in the first place. Trust is not even here a second order feature; indeed, one might say, following Anderson and Sharrock, that it is not trust that is the basis of these settings, it is distrust. After all, in these contexts, users need to be alert to the fact that they are in situations where there is reason not to trust. Things cannot be taken for granted. When people go to a financial services website, to their bank say, they must assume that the bank will want to start its interaction as if they are not who they say they are, as if they might be a villain. Thus people approach their bank willing to answer questions about their identity that turn around the premise that they might not be who they say they are. It is sensible to expect this; they should not be offended. By the same token the user might also assume that when she or he interacts with a bank website, they will put especial effort to make sure it is the bank's actual website, not some simulacra–a fraudulent representation, an attempt at phishing. Just as the bank needs to start with doubt about them, then so too do users need to approach the bank with doubts about whether it is in fact the bank they are dealing with.

However, and this is the second feature of those contexts in which calculative reason is appropriate, surety in this regard becomes an opportunity for villainy. The stable form of trust manifest in for example a bank website–in the patterns of behaviour around it–can become a resource for mischief. Indeed, it inevitably will as the stability in some such setting provides an opportunity for villains to ride on that back of what users and organisations come to take or trust. Signs relied on to indicate that the site is real can be copied; processes that seem designed to ensure identity can themselves be copied and turned into tools for phishing. This is why Sasse and Riegelsberger say that designing trust in systems is a never ending dance: trust begets opportunities for mischief, the mischief demands new requirements for design.

A third feature in such contexts is this: just as it is the case that there can never be perpetual security about trust, so it might also be the case that at any moment in time a user might misjudge the situation they are in. The user might have the sophistication to know that even the

most trusted system will eventually be broken, but they might not realise that it has been broken in the here and now–at that very moment when they are using it. Again Sasse and Riegelsberger: they note that keeping users alert to the possibility that at any time they might find their trusted system broken is a constant design problem; users are often overly confident.

Finally it might not be only e-commerce settings that need to be devised to foster an attitude of calculative reason. When David Clark, in chapter 1, makes a summons to address trust and the internet, he is not thinking of e-commerce alone. Clark's focus is on the question of identity when the identity in question is strangers–it was not just banks talking to customers that he was thinking of, in other words, but when people meet through the internet via any means at all: via a secure bank website or via an email; through an instant messaging system or a social network. He argues that these contacts–wherever they occur–cannot be undertaken with the same largesse of spirit that is applicable in 'normal' face to face circumstances. Here there are numerous resources at hand that allow people to make richer judgements about the other. The constraints on the web make these resources limited. And, for this reason, the risks of dealing with someone whose motivations are not good are thus greater. In his view, we should all worry about trusting strangers on the internet. Clark's concern is that many people do not recognise this and so do not apply the right form of reason and this reason should be, as we have formulated it, calculative. The chilling affect this might have on certain form of human contact on the web hardly needs remarking.

The culpable self

Part of the elemental features of this calculative reason, then, has to do with its applicability, its scope, the determination of where to use it. Thus far we have listed some features that one might reasonably say are requisite in those contexts where distrust pertains; one of those features has to do with recognising that one is in a situation where calculative reason is what one needs to deploy. One might misjudge where one is. There is obviously a difficulty here: knowing whether to apply a way of understanding–the echoes of Garfinkel ring strongly: reasoning requires work in the practical world.

Some of this work has to do with subtleties. Clark's concern – and indeed the concerns of Sasse and Riegelsberger – have to do with interaction between people. But there is also the possibility that issues of trust might relate to questions that don't involve another, a second person. Something about the relationship people have with computing might force them to adjust how they reason with that technology so as to make it calculative. The issue here has to do with whether a user's own practices, mediated computationally, are causing them doubts of some kind; and specifically not as regards to whether they can trust others, but whether they can trust themselves.

Consider this example. Some years ago mobile phone operators in the UK offered mobile phones to those only who were willing to set up a system with their bank. This system–direct debiting–allowed the operators to demand from the customers whatever was owed to them at the end of the month. Such a system was viewed as a means of ensuring that phone bills were paid–given that they were paid retrospectively. However, there was some pressure, particularly from political activists, that this was prohibiting access to the mobile networks by the less well off, the economically dispossessed, those without bank accounts. The operators responded to these concerns by saying that they could set up a process where phone contracts were 'prepaid' with some cash amounts being spent in advance of actual phone usage; once spent, the phone would cease to function. However, the operators were very resistant to going down this path. This was because they were convinced that people who would really benefit from such a system would not be the economically disenfranchised–after all, so the mobile operators thought, mobiles were a luxury and so it seemed odd to set up a system to allow those without surfeit income to indulge in this way–but those who wanted to hide their identity. For, with the prepaid model, no proof of identity would be required; all that would be needed was cash. The operators, in other words, had a theory about this–a lay sociological theory. People who wanted to hide their identity (via living in a cash only telecommunications world for example) were villains, crooks of some sorts. Those who wanted prepaid would be people that ought not to be trusted, the operators believed.

The use of the word theory here suggests the view was merely a hypothesis. This does discredit to the richness of what was meant and what was done by the operators. The operators looked at the issues at hand–how to extend the footprint of mobile usage–by, for example, trying to imagine the motivations of potential users and then assembling a picture of those users in such a fashion as to predict who would take up a prepaid system. Part of the way they did this was by evoking ideas about normal life: ideas such that 'mobile phones were a luxury' and 'therefore it would seem odd' to try and set up a system that allowed the poor to have easier access to the technology–not because one would want to stop them accessing the technology, but because they would not take up the opportunity. According to this interpretation or account, if people had tight budgets it would not make sense from their point of view to pay for a mobile, prepaid or otherwise. It would not be practical to have a mobile given the facts of their life. In this respect, the operators were trying to reason through how they thought people with low budgets would reason; they were solving, if you like, the problem of understanding a situation in much the way that a coroner would: by coming up with reasoned accounts of 'reasons', reasons in this case to own an expensive product, a mobile. By the same technique, the operators constructed the kinds of motivations that might account for those who would take up a prepaid system if not those with tight budgets, motivations that led the operators to imagine it would be criminals who would use this system. The operators constructed the kinds of persons who would want to hide

who they were. 'What kind of person would this be?' the operators asked themselves, 'Well obviously, a criminal person'.

Leaving aside any further remarks about the nature of this theorising, how it developed its characteristics and so on, the operators relented and a prepaid system did emerge despite their reservations. This led to a massive uptake in this way of paying for mobile phones in the general. And the scale of this uptake was more than could be accounted for if it was only taken up by those who had either been excluded from mobile connectivity for reasons of economy or if it had only been taken up by the disreputable. If volume was anything to go by, others, too, used this new system.

Who? Why? The operators wanted to know. Obviously their understanding of the marketplace–of the consumers in that marketplace–was being shown to be wrong in some way. At that time, various researchers, including one of us (Harper), were engaged by the operators to investigate this (Brown, et al, 2001; Green, et al, 2001). The research showed that, for example, parents like to pay the bills of their offspring not because their offspring were poor or had no bank accounts but because the parents wanted to participate in financial discussion with their children through the aegis of having the mobile phone bills at hand. Mobile phone bills became a pretext for parenting (Harper, et al, 2005). We found that the use of paper bills were also thought of as important for similar reasons–making bills and their payment a public phenomenon in a home, for example (Harper, et al 2003).

We also found that one of the major reasons why prepaid was so successful was because it enabled people to manage their finances in a way that was surprising. At first glance, managing finances would seem to point towards a platitude: people need to budget. But the character of the management we found, the thing that prepaid allowed people to control, was not as it appeared. With prepaid, people found that they could allocate an allowance for their mobile at the beginning of some period, a week, a month, even a weekend. They used their planned spend as a way of controlling their own behaviour in the future. They would make a choice beforehand and use that as a stick to beat themselves when required. Though users could always add to their prepaid at some future point–the operators allowing people to buy more minutes on demand–people liked the prepaid since it allowed them to excise control not over their purse but over themselves. And here comes the rub: the problem that it allowed people to solve was that they could not trust themselves to stop talking or texting; people knew they might become so intoxicated with a call that they could not end. A chat could too easily turn into a grotesque bill.

Giving psychological colour to practical reasoning about trust

The point of this historical example is to beg the question of how people reason about trust in practical affairs–technologically mediated in the case–and it points towards how this theorising

leads to specification of who is involved in trust. It also points towards some of the methods that people devise to ensure trust in circumstances where it is themselves that are 'untrustable'.

As we have noted, many of the commentators on the topic of trust and the internet like to seek primordial features to the nature of reasoning about trust that would apply to any and all situations where that reasoning occurs. We have suggested that there is a delicate line between making insightful observations about the character of practical reasoning in real world contexts and offering up what can best be described as caricatures. This is not to say that certain elemental or basic features to variants of practical reason cannot be ascertained, simply that care needs to be used in their determination. The last example shows that what might seem to be an obvious 'primordial' can be egregious: two or more persons are not always involved when matters of trust are at hand. In some cases only one person is involved. The question of trust–of how to reason about it–has to do with trusting oneself.

This points towards what one might call the psychological. Often in discussions about trust this is invoked as the source of the ineffable, of irrational motives behind action. One can think of Fehr's work particularly here (2009: 235-266; See also Henrich et al, 2001, pp73-78). What we are beginning to see in this last example is how, even what in what one regard as calculative reasoning, there is a concern for the psychological, and though it might be true to say that these concerns might be treated as a given (as in 'I cannot trust myself' as a premise of action) it would not be true to say that they are not reasoned about. If one took out the psychological in a characterisation of reason about trust one would not be offering a clearer picture of that reason but one that is corrupted through an absence–it would be missing something fundamental. Or at least, it would be in certain situations, in particular 'situated logics'.

When one thinks of the psychological, there are various starting places that come to mind, of course, one having to do with the self. One thinks of Hallam's Virtual Selves, Real Persons (2009) and Taylor's Sources of Self (1989). These are attempts to integrate and balance all the things one might say about the self. What we are thinking of is driven however by the above examples related as they are to consumption and constraint. This leads naturally to the work of Gilles Deleuze (1990). His research looks at what he proposes are the elemental features of the self and its handling of consumption. Deleuze tries to recast the self in terms of the id and the ego, in Freud's conception in other words, and the links that to contemporary concerns, ones to do with modernity, and especially the politics of consumption. In Deleuze's view, one aspect of self controls another aspect. The consumer is one part of self, a restraining moralist the other. The modern self, Deleuze argues, has to reason through the tension of desire and restraint that reflects this duality. Deleuze highlights this because of what he believes is the intoxicating nature

of modern consumerism: the need to deal with the cost of mobile phones whilst appeasing the desire to talk is a perfect illustration of this concern.

Here is a question of how the psychological comes to play out in issues of trust: the question is not trust in others but in one self. What we are wanting to point out is that this kind of psychological colour, these sorts of concerns, are presumably what approaches like that of Taddeo expressly want to exclude from consideration in the starting place. But if they do so, it seems to us that they might be missing important constituents of what reasoning about trust entails when that reason is examined in vivo, as real lived, enacted reasoning. Taddeo's view–being treated here as illustrative of a tone and a method in research on trust–seeks to reduce trust to essentials, but what is cast as a result takes important aspects of reasoning about trust in the real world out of view altogether. Taddeo might view this as a virtue. We do not.

Turning again to what everyday reasoning actually consists in, what we are suggesting is that the psychological may have various inflections when seen as a constituent of everyday reason–one needs to see what they are. This Freudian cast is doubtlessly not the only one, one will find, needless to say. Consider this following quote from a user of Facebook and how she is 'theorising' about the nature of ownership, ownership of digital entities. She had recently experienced a hard drive crash, losing her digital photo collection in the process. As it turns out, many of these photos were also on Facebook, and she had recently taken to copying the online photos onto the local hard drive on her new laptop:

> *"…talking about it made me realize they [digital photos] are high up there. …that's why I feel like I need to copy them somewhere, have them covered. …I do that and I've done that and I don't even think about why I do it. I am scared of losing them, but I didn't realize it until I started talking, right here, consciously you know. …I use the sentence 'I've got some photos', so I've said it, but I don't know really if I possess them, not until they're here [pointing at laptop], at least then I know where they are."*

One can readily understand the apparent problem this person has. Worrying about how she will 'own' or 'have' her archive of photos in the future and relatedly, where they might be, are grounds for practical concerns; understandable ones as we say. What this subject points towards are to do with the relationship between the properties of real things and concepts like ownership and responsibility. The psychological inflection in this case has to with how these concerns reflect the relationship between things and her self, what she thinks of as herself. Who she is one might say is bound to these connections.

The research from which this quote is taken entailed meeting with various people to understand how they dealt with and reasoned about, the cloud, or at least how they reasoned about various services enabled by cloud-like infrastructures–Facebook and Flickr for example (Odom et al. 2012). The research is particularly focused on everyday reasoning about possessions and their digital form. In this case, despite a recent loss of data on her local hard drive, this person moves her things from an online place (created and maintained by a third party service) to her own local hard drive. In this way she is better able 'understand where they were'. This understanding is evidently related to her experience; this led her to doubt in her own sense of where things are and whether, consequently, they are safe. As a result she decided to make her digital archive more 'at hand' by not only having a place to view her photos (on a screen), but also by having a physical manifestation of where they are kept–by putting them on her hard drive. In this way she reaffirms a way of knowing where her digital possessions are. Being aware of where something resides, and being able to point to that physical place, enables her to bring a sense of order to her digital archive in a way that fits with her normal everyday life and practices; it makes sense to do so. One might say she calculates that this is so. But one might also say that this gives a psychological certitude to her reasoning; with this sense of location she can feel more secure.

The example points towards how this way of reasoning–a form of the calculative reasoning mentioned above–includes a sort of Gibsonian primitivism (Gibson: 1979). In this view, things have properties, affordances if you will, and these can be relied upon as clues to other things, other properties or affordances. Accordingly, one can assume, for instance, that when an object is pushed it moves, that things remain still if they are left untouched, and if they are inanimate, they will remain together until something makes them separate–a hand that moves them or takes them apart, and so on. Obviously, things have more than these affordances; moral overtones also come to apply and these cannot be characterised in the concept of affordances–like the ideas of possession and ownership just mentioned.

Before we get to those issues, the Gibsonian primitives that do not include these moral imperatives can be brought into question with the cloud. In the physical world, one of the characteristics of the things we possess is that we generally have some sense of what we own and where these things are; this is interrelated. Place and ownership go hand in hand even before we fret about the price of possession. We can reason on that basis of these bare facts–primitive affordances. So, for example, we structure and organize our things into containers, putting them in special places, and we often bind spaces to particular values: things put in one place have more value than things put in some other place, for example. Think of the contrast between a safe and a drawer. These acts of putting and categorising, as mundane and practical as they are, are reasoned ways in which people create a sense of order to their lives and the things within it: this

reasoning brings organization to the material world. There are various key things salient in this organization, of course. Homes for example act as a kind of physical locale that is bounded. It contains many of the material things we possess. Within a home we may have further subdivides or special places to further contain them. These might distinguish between what different members of a household own, as a case in point. When it comes to digital possessions online, however, equivalent structures of place and ownership and ordering cannot so easily be discerned or made. There is even sometimes some ambiguity–a lack of trust seems too strong–as regards the essential status of things: what they are is unclear.

Consider this quote: "Well, when I put photos …or personal information online, I've come to accept there's no certainty they're here or there, they're just out there." While promises of the cloud entice people to put their things online for safekeeping and storage, in other words, something about the way that content is presented to them thereafter causes them to doubt in the things they see before them. Their trust in even the most primitive of Gibsonian affordances–that things exist in ways that can be acted upon–seems to wane.

As seen in this subject's reflection, remote services can have disruptive effect on essential, everyday concerns of organizing, or even interpreting, where personal digital things 'are'. Given this it was hardly surprising that some of those we interviewed in our various studies of the cloud and remote storage (Odom, Sellen et al, 2012; Odom et al 2013) created various physical representations of their digital stuff: with these at least they had something they could point to. Similar to the example of the Facebook user backing up her online photos locally on her computer, we came to learn that people often use external hard drives and, at times, storage media like CDs and DVDs, to back-up their digital things. In these ways they were able to produce a sense not only of the familiar but of the controllable; a world not only with things, but possessions and all that implies. Thereby the world at hand can be one they can reason with, they can trust in. Creating a physical representation of a remotely stored archive, a cloud archive, allows people to mentally take stock of their things and their responsibilities: with this audit in hand they can then act; they can reason.

Giving physical form to the digital was bound up, then, with the practical desire to create some sense of trust in digital things, even if the motivation for this behaviour had been negating a lack of trust in one's own competence in the first place. People knew that they could hardly trust themselves to store things safely, but they came to learn that the cloud and all it afforded did not offer a perfect situation either, certainly not one that avoided profound doubts. And thus though they might turn to alternative, local storage media which they knew might and indeed probably would degrade over time, making this decision nevertheless made sense. It was rational, accountable. The world is not a perfect place and this included the world of computing. To put it

in other terms: the world cannot be made like some scientific experiment, ideal in all respects. People have to reason in accord with what is practical and this means in light of their own failings and the ineffability's of digital storage, remote or local.

Part of what is ineffable here has to do with access. When one puts something away in a safe place in one's home, one is trusting that that thing can be brought to hand when it is desired, and that this same thing can be put back in that safe place, by one's own action. But in our interviews we found our subjects worrying about not having such practical control over the services that host the place(s) where their digital stuff "lived". They reasoned that this might lead to temporary or perhaps even permanent loss of access. For example, consider this subject's discussion of her Facebook content, and her reasoning about losing control:

> *"I have this fear that all of a sudden it's going to get shutdown and they're going to wipe [it] and I won't be able to get it back. So it doesn't feel like I'm fully possessing it, I mean I feel like it's my information ...but it's like I'm not in charge of it fully. Like it's at the mercy of someone else."*

This sentiment was common; moreover, it was a worry that seemed to develop as people reflected on what they are seeking with cloud-based services. Though those we interviewed had an initial lack of trust in themselves to store all their digital things, and this prompted them to put personal content, like photos, in the cloud, over time these same people came to start doubting in their choice. They began to realize that though it might have made sense to hand over their treasured things to organizations that offered security and reliability, services like Flickr and Facebook are not in the business of safeguarding possessions in ways that, say, a bank might: after all, even if a bank went bust things in the vaults remained. But, what of Facebook? After all, our participants reasoned, who recalls Bebo? What happened to stuff stored there?

In this manner, several people described their doubts over the trustworthiness of the unseen and largely unknown third party entities. Consider this subject's reflection on how the deletion of his now departed friend's Facebook account also erased the social metadata his friend created:

> *"Those comments were a big part of what I had left from him. ...his personality really came out in them. ...Now they're gone, just gone and they can't be replaced. Even if I could get them back, it wouldn't be the same. It's not just the text ...it's the time he wrote it, the day he wrote it. It's like this marker of him and it all came together into something special. ...made me realize how fragile things online can be."*

This person's initial reasoning about how cloud environments, like Facebook, operate did not thus fully align with the reality of how they worked, and this led him–and presumably others–to doubt in the trust they initially placed in the service provider. More generally, our participants came to reason that cloud environments may not be morally and not just practically appropriate places to keep, organize and give structure to valued digital things. Something about the values in question were too closely related to the persons who were responsible for them.

Beyond affordances: morals and commonsense reason

What this points towards, then, are how the concerns of practical reason can become complicated in the age of the cloud and that these concerns might agitate at quite a profound or deep level, one that might be characterised as psychological. It may be that things become a little more difficult to manage, to reason about and deal with, because of this technology. Things and their moral dimensions particularly can get muddled, somewhat lost; even more so when an individual moves from creating and dealing with stuff on their personal machines, their laptop as in the subject above, and starts sharing that stuff with friends and colleagues on social networking sites. This is despite these sites–and the infrastructure they are built on, the cloud–being evoked as being places will allow people to keep things more safely– think of Karagiannis' chapter at the start of the book; think also of the much more brash claims in Carr's *The Big Switch* (2008).

So, what should be clear now is that, in reference to everyday reasoning, what we have suggested earlier is often calculative in form, there are various frameworks that are deployed by people to approach and deal with contexts of practical action. Part of these frameworks has to do with relying on, for practical purposes, what we have called some the Gibsonian primitives of things, and at the same time with the moral aspects that shroud these things–like ownership, sentiment and such like. What the evidence above suggests is that when shifts in computing architectures occur it may be that a person's ability to trust in themselves diminishes by dint of losing surety in these counts–on the Gibsonian primitives and also and somehow thereby also the moral shrouds. This leads them to worry about the possibility that some responsibilities– properties endowed on some object–cannot be dealt with in ways they might want or need. After all, sentimental value is not something that can be handed over, if one has promised to look after something. It would make no sense to hand over that to some third party if one wants to continue exercising that role. People start to develop doubts about their existential relationship to digital content: they worry about what is theirs, what another's, what they possess and what they cannot own. Questions of trust come to the fore in these doubts, though these have less to do with, say, financial matters, fraud or identity theft as is often mentioned when the term trust and the cloud is mentioned, as they do with the sense of self and its manifestation in digital things.

The psychological and the social

Beyond these concerns, another set arise when things are put online which we have not yet mentioned. Once things go online they can become the source of sociability, of ways of sharing and giving. For example, one of our participants reflected on the newly formed distinction between her digital photos on her hard drive and the copies uploaded online:

> *"...they get comments from my friends and family, and those acknowledgments and stories become part of them. ...When I think about the photos as my possessions, I think about the ones on my computer and the ones on my Facebook as different. My [local] photos are me saving them for my family, for the future. ...On Facebook, the photos are me and my family and the connections we have with other people through the comments. I want both of them."*

One can readily understand the problem this person is facing. Worrying about how she will 'have' both sets of her treasured possessions is entirely sensible for someone to want to safeguard their cherished things. These things announce who they are and, perhaps, who they want to become. Her concern is bound to everyday affairs of identity production if you like, and the relationship between her newly valued things — her Facebook photos — and how concepts like possession, ownership and the social connections that they enable make her who she wants to be spill out in the term thing: what is the thing here? An essence or some combination of metadata, tags and the thing itself.

This is not an obtuse philosophical problem. Young and old alike are familiar with how to use digital metadata as a resource to extend a sense of sharing with family and friends. It is what ensues that is the issue. Consider this reflection from one of the teenagers we spoke to: "We write things if something catches our attention or [we] remember something happened in that photo. ...I posted them, but I put them up there to share and it's like when we all write on them and tag them, it's those things that make it feel like we all have them together." Similar to how one might annotate a photo album to capture a shared experience and then share that photo album when in the presence of those represented in it, social metadata is attached to photos in the cloud to create a sense of shared significance across and between friends; it is a commonly understood, everyday practice. However, social metadata, and the cloud environments that enable it, are introducing new reasons to doubt what is meant by the term possessions, particularly when concerns of ownership and social propriety come into play. Consider this subject's reflection on his Flickr account and the nature of 'possessing' content on that site:

> *"Some of the most significant moments of our lives are in there. …Over time, so many comments and stories and traces of where we've been are recorded. …When I think of my most important possessions, this is at the top of the list. But at the same time, I have no idea how to*

get them, not just the photos, but everything together. …that's where 'possessing' them breaks down. … I want them, I'm entitled to them, and they're there [motioning to screen] but do I have them? …it feels like there's this illusion that they're mine."

This participant kept his photos on the Flickr service based on an understanding that it would keep his archive safe and that he would be able to share the archive with trusted loved ones as and when he wanted. Even so, while images from his online archive could be summoned on his computer screen, doubts emerged around whether the archive was 'real'. An image on the screen could be pointed to, but was it really there in the sense that, say, his parents' photo albums that had once sat on a shelf in his living room were real? If the photos (and their attendant metadata) could not be taken out of the account once they were in 'there', then would they be owned, possessed, looked after?

Reasoning about one's responsibilities

This participant's reasoning can be understood as a normal, practical worry that is commonplace. People commonly save important things, store them away, look at them occasionally and eventually pass some of them down to others as a way of ensuring a legacy. Clearly cloud places, like Flickr, can be useful for archiving a person's most important digital possessions and indeed recording rich social histories onto them over time. However, these new 'places' also raise basic concerns: how can a person trust that they will be able to gain these cherished things back in the future? The question here is not just the thingyness of the object, but the cargo of human values that go with it. It is clear, in other words, that services enabled by the cloud bring into question notions of ownership and possessions that are almost taken for granted in the material world. Knowing where one keeps a possession is often bound to a responsibility to care for and protect it. It is not solely a matter of knowing where things are and being able to bring them to hand. There is accountability implicated in many of the things that one possesses. There can be, for example, a duty to keep objects safe for someone else's sake, or to pass on items to future generations. (This is hardly a discovery, of course, but interesting work on this can be found in Miller, 2009 and in Finch & Mason, 2000). Putting things online can cause people to doubt whether these systems of accountability will function as well, or, to put this another way, whether they will be able to act in the accountable ways they want when things shift onto the cloud.

Some of the most compelling examples of these worries come from people that possessed digital content of departed friends or family members. For example, this subject describes why he now questions the commonsense notion that cloud contexts, designed by professionals with a high degree of competence when it comes to safely storing digital things, ought to be trusted over his own, non-professional competence to deal with these things accountably. Here, he

describes uploading digital photos that had belonged to a departed friend to his DropBox.com account:

> *"My first thought was to put them on DropBox, like if my computer dies, they'll be somewhere else. Then this whole thing came out [about] nothing on DropBox being safe and heaps of people's accounts weren't as private as they thought. …I was thinking, you know, they're the professionals here. What do I know? But, turns out I was wrong. ...I had this wretched feeling, like I was being lazy about [departed friend's content]. ...I took them [photos] down immediately. ...They're backed up on my [computer] hard drive and on a CD. I'm more in command of their destiny."*

Another subject describes how her lack of trust in online services complicated transitioning digital photos and documents from her father's computer to the cloud:

> *"I felt like I needed to protect it ...[put] it in a special place. ...I did think about putting it online, but it didn't feel right. ...It probably wouldn't [disappear], but who knows? ...What if it was accidentally erased? ...Those are chances I can't take."* When we explore further the very real possibility that the hard drive in her personal computer could crash, she pointed to a higher level moral concern: *"I know my computer could die, but at least it would be on me. ...it's my responsibility to take care of it. Leaving it up to a website, there's no guarantee it's going to stay around. I can't live with that."*

The evolving socio-digital landscape

What is interesting in examples is how peoples' commonsense reasoning about the trustworthiness of cloud storage contexts change as they seek to bring a sense of social and moral order to some of their most precious digital things. In one example, the subject began reasoning that a cloud service created by professional practitioners ought to be more trustworthy but then came to the conclusion that his digital content would become vulnerable to an unknown amount of potential villains 'out there' online, in the cloud. These villains might not even know then they are villains. They might not realise how precious something is. How could a cloud provider know this, this subject seems to imply in their responses to our questions and interviewing. All they see is a digital entity, a list of bytes and a store address. Values are not made incarnate in these properties. In a second example, the subject reasoned that a personal hard drive failure is more morally acceptable than the potential 'accidental' deletion of their content by a cloud service. In both of these cases, then, people are left with few viable alternatives other than to revert to trusting themselves with safeguarding their digital things, even though they do this begrudgingly and with anxiety. These choices are practical and motivated by clear reasons not to trust cloud

contexts; they enable people to socially order and become morally accountable for their digital things, despite the fact that storage devices and media can and do become corrupted over time, and can do so in unpredictable ways.

One further aspect of the moral values that enshroud digital entities is worth noting. An aspect of possessing a material thing is that there is some level of control over others' ability to access or use it. If you possess something, you have the right to alter that thing, or to give or loan it to someone else. And, if this is so, it is taken for granted that others have no rights to alter, take, or borrow your possessions without your permission.

Again, the cloud introduces more complexities to this basic property associated with phenomena and how we reasons about them. Part of this owes to the fact that digital things can be copied and someone other than the original owner can easily control those copies. Consider the following example in which a subject illustrates this through describing an undesirable experience she had on an online dating site:

"I used to be on a dating site and I had a photo of myself on it. ...after a disagreement, a man I'd been talking to took it from my page. He sent me a message saying, 'If I can't have you, at least I can have your picture on my computer.' ....He put it on his desktop [background image]! ...that was 'my' page, 'mine', he shouldn't have been able to do that! I couldn't get rid of it [on his computer] because it's not 'mine' anymore. ...I possess the original copy, but that doesn't feel like mine anymore because of what happened."

Similarly, another participant explained how a lack of understanding the duplicative properties of photos in the context of the cloud made them doubt in their own ability to fully possess these things:

"...the real way you can keep some possession of a photo online [is] knowing who can look at it. ...once someone has viewed it they take some possession of it, but if I am the one letting that happen, then it's still mine. ...but if someone gets the photo without you knowing, then I don't know if you can ever really get it 'back'. Because who knows what's going to happen with it once they get it."

These instances help illustrate how peoples' commonsense understandings of possession degrades as these services fail to draw appropriate boundaries that keep their things safe and away from unwanted (or unknown) use. If our evidence above is mostly from the UK, a recent study conducted by Odom and colleagues (2013) found that young adults in South Korea, Spain and the United States had similar doubts. It found that people across cultures largely shift their view of cloud storage services to be simply temporary platforms whilst moving their digital possessions between geographically separated computers.

Consider this US subject's account of the reasons prompting him to ultimately take his files out of the cloud:

> *"At first I thought it would be great to keep all my files and stuff in the cloud. I'd hear about the promise of the cloud and it seemed like a great idea to be able to have access anywhere. …But it doesn't work the same way in practice. …Because when I put my stuff up there, it's open to it being messed with. Someone I don't know could get ahold of all my information and documents without me knowing it. And, who knows even what the company is doing with it. They probably have access to all my stuff and they're gonna care more about the company than me. I have no idea when they're looking at it. …It's not smart to realize this and still keep everything up there. …Until I have a better idea of what's going on and that my stuff is actually safe, I'm going to keep it right here [pointing at laptop]."*

Many other young adults develop this same reasoning: using cloud services to move their files between computers they commonly use helps bring a sense of order to their digital archives; it seems also a responsible way that fits with their everyday material affairs and practices.

At the same time, many of people are doubtful of the longevity of the computers their files are locally stored on and so worry about their eventual demise. In some cases, young adults maintain Internet-enabled external storage devices in their homes, as a matter of instilling a deeper sense of trust in themselves and their competence to take care of their digital archives. The everyday uses of these devices are to backup cherished digital possessions and, in a few cases, share these things with other known entities (e.g., family, friends) through remotely accessible folders. Nonetheless, worries commonly persist which center on the vulnerability that even several points of storage are susceptible to when kept in a single geographic location, making it possible to, as one American subject states, "lose everything, years' worth of memories."

The worry that this participant voices above is a common, everyday concern that nearly everyone experiences: the question of what few possessions one would grab in the fleeting moments before fleeing a burning house, or what small assortment of things could one truly live without. Mental exercises about these questions help people explore what is important to them and why; making sense of them helps them practically interpret and order the world around them and how they want to construct it.

One of the compelling qualities of digital things that seems appealing in this light is that they can be copied and thus, in a sense, stored in more than one location at once. While this quality clearly causes some subjects to doubt their trust of cloud contexts–duplication begging question

of ownership as we have seen, for example–others leverage this to share and safeguard their digital things in ways they deem more responsible and morally appropriate. Some Spanish and American subjects in the study engaged in similar practices of storing redundant copies of their archives across a select set of networked computers owned either by family or friends, for example. As a case in point, one Spanish participant stored valued digital possessions on their own computer as well as on a shared folder of a close friend's computer. He considered this to be a safer and more private way to practically ensure the safety of both people's cherished digital archives. In another case, an American participant described the significance of creating shared remote folders on his brother's and sister's computers in their respective households:

> *"I wasn't thinking too deeply about it when I did it, but over time I have really come to value it. ...there's significance in storing things important to me in places and with people I trust. ...And I'm doing the same for them, looking over their things too. It's a different way of knowing your things are safe. Something we could never do with our physical stuff." Another American young adult similarly describes maintaining a remote folder on a computer in his parents' home in which he keeps cherished photos, email messages from a departed friend, and videos of his college graduation: "...it's not just about the things themselves, but also where and how they're kept. ...it makes sense to keep them in my parents' home right now. It's a safe place. ...they watch over a lot of things from my past already."*

Discussion

While these last practices might appear to be undertaken by the technologically sophisticated (and indeed some of the subjects were technically proficient), they present clear illustrations of how people create a level of moral accountability and control over their digital archives in ways that are not driven by technological imperatives. The systems they create are social in nature and reflect what we have suggested are issues of a psychological character. When we say psychological we are alluding to how people themselves cast certain issues as pertaining to themselves, to what their self might be and what is its accountable for. Nevertheless, and as one subject remarked, these individuals did not 'think too deeply' when engaging in these practices: their reasoning is responsible and 'made sense'; it reflected the common understanding of everyday life shared by these individuals, their friends and families, psychological or otherwise. It is, in other words, everyday practical reasoning. The particular purposes of this reasoning was to bring order to their digital archives in morally significant ways—in ways that enabled them to trust in their own competences.

It is clear that people try to assemble a socio-digital context, a topographical arrangement of the digital stuff, in ways that requires them to be inventive. They have little experience of the

cloud and what they have makes them more unsure of how to deal with its properties. One consequence of this is that people start to doubt in their own ability; their inventiveness is not sufficient to deliver what they need. We found users worry over where their things are, if they are safe, if there are unseen villains prying at the gate of their online places, or whether the cloud services themselves are meddling with their digital archives in unseen and unknown ways. They even worry about whether they know what their things 'are', their essential phenomenological form: an entity or a bundle, a picture or a picture and its tags; a single thing with metadata or a set of copies spread around an invisible world.

These newfound worries lead to a range of different behaviours. People revert back to old habits that, while they think often risky in the long term, nonetheless enable them to bring some sense of order and moral accountability back in to their relationship with digital things. In some cases, not mentioned above but documented elsewhere (for example, see Odom, Zimmerman, and Forlizzi, 2011), people create physical proxies of cloud based information (e.g., printouts of a Facebook wall or Flickr homepage) in attempts to develop a deeper sense of trust that they knew 'where' these things are, even if this sense of trust is largely false. And, in yet other cases, ones we have described, people develop workarounds to subvert proprietary cloud services all together, reasoning that their own networked storage drives could alleviate newfound worries and shift trust back to themselves to take care of their digital archives in practical and responsible ways.

So how then, might we think about new ways to design Cloud technology? How could Cloud services be designed to support people in ways that brings order and accountability to them? The sensitive and, at times, paradoxical worries brought on by the cloud suggest we ought to examine how we interact with the cloud and the archives people keep there in ways that has not been done satisfactorily before. In what follows, we outline several design considerations that present possible ways forward.

Retaining moral accountability and guardianship: While the promise of the cloud initially led to people to reason it would be a safer and more trustworthy place to keep their digital possessions, over time users develop strong doubts over whether the cloud's promises are true. People worry about the longevity of cloud services as well as possible unknown or unseen actions performed on their digital possessions. Ultimately, trusting one's most treasured digital things with the guardianship of a third party service 'in the ether' conflicts with people's desires to treat their archives with safety and care. Taken together, these practical concerns make it increasingly difficult for most people to reason that the cloud is indeed the safest context to safeguard their cherished stuff.

One potential way forward is to create cloud architectures with demonstrable properties that make it difficult, if not impossible, to destroy the digital possessions contained within them. The

immutable file types embedded in particular cloud applications and enabled by such architectures could work to (i) help people better trust their reasoning that their files would be safe and preserved in demonstrable ways and, in this way, (ii) create a cloud computing context that places control over guardianship more explicitly back in the hands of the people that own the data.

Additionally, the creation of multiple and remote folders distributed across geographically separated computers can be made manifest and thus given social value. Remote folders can mirror digital archives across multiple locations, and can thus provide a sense of assurance that at least one version the collections in question will endure and be accessible. These examples highlight how not only are peoples' digital possessions safely backed up on their own terms, but also how meaning is attributed to the remote social contexts in which their things were stored. In a sense, people are able to subvert some of the worries introduced by the cloud and shift trust back to themselves, while retaining some of the innate benefits of networked redundancy the cloud computing offers. This suggests an opportunity for creating new services that more easily enable, for example, family members to create networked folders on each other's computers. There could also be new, embodied forms of these networked archives, which communicate the safety and status of the owners' and their loved ones' digital archives.

Trusting you can share and be shared with: A core motivation to put things in the cloud is to share them with others. These actions occur through various platforms, such as social networking sites (e.g., Facebook, Flickr) or applications that directly support cloud storage (e.g., Dropbox). These services offer opportunities to connect and exchange things with people and in some cases accrue social metadata. The social process of sharing a digital possession online can transform that thing in question when metadata comes to extend the meaning of the exchanged artefact. The thing becomes something that is collectively possessed. Yet, as we have described, this can be problematic, leading to confusion and doubt over where possession lies and worries over the actions of others in relation to the digital thing (e.g., whether it has been copied and could be used with mal intent). These concerns again come out of an ambiguous understanding of the context in which exchanges in the cloud happen. The difference is so stark as compared with the act of sharing material possessions that it makes it difficult for one to practically reason about what the outcome might be and how, for example, people can trust that social propriety unfolds in the same ways it does in the real world.

One way forward entails developing a technical capacity for people to retain some sense of the originating possession and of its history in the cloud. This could enable shared possession, while at the same time point back to the original artifact. In other words, cloud applications could be developed that extend representations of data to people without fully relinquishing the possession to them. We imagine if it is possible to extend such rights to people for experiences

of joint ownership, it must also be possible to withdraw those rights. However, people's practical ability to give up their rights to access digital things are dramatically underdeveloped in the cloud.

Current architectural design in many systems provides little choice other than letting data persist on the network or removing it completely, which, as we saw, has significant consequences for the people that value these things. There is a need to more sensitively handle the nuanced social connections among people. In some cases, this might give reason to remove connections among some people, while retaining others.

Another way forward focuses on providing people with more awareness over the context in which the exchange occurs. This includes developing tools that enable people to query any digital possession they own to view other people's actions in relation to that object. In doing so, they could find out who else has made copies, who has modified an object, who has added metadata and so on. Applications in this design space could better support people in interrogating their digital things to see what has happened to them, and who has interacted with them. This obviously raises some challenging issues for privacy, and needs to be handled delicately to avoid introducing new doubts and worries. However, these issues could in part be overcome by allowing the owner of the "original" possession to have certain permissions to view subsequent actions upon that object, as is the case now with many online services.

Conclusion

These design directions described here are no doubt a handful of what could be many. Others, better versed in the architectures of systems that enable computers and networked devices to connect to the cloud for viewing, sharing, and taking stock of our digital possessions might have supplementary views. However, what we want to emphasize is that our work shows that this emerging technological platform, the cloud, and all its promises, can cause people to doubt their own competence at taking care of their digital possessions—bringing order and accountability to them, and, in doing so, the world around them. Like physical things, digital possessions play an important role in how people assert their identity, realize their aspirations and interconnect with the lives of others. Unfortunately, as people increasingly engage with the cloud, seeking to place their digital things in secure storage and share it with others, they are met with new worries over profound issues they thought these new systems would help alleviate. Questions like 'who has it', 'where it has gone', 'will it still be there' remain things that people reason about even in the age of the cloud. These doubts and questions often lead people to revert back to their old practices—even if they reason these are clearly risky in the long term.

We have aimed, in this chapter, to unpack how people's trust moves from themselves, to the cloud, and often back to themselves through the groundwork of practical reason. This helps

make manifest these situations of choice in the context of everyday life. As the cloud threatens to introduce doubts and worries into our lives further, it is a good time to take a fundamentally different approach to enabling people with the practical tools and competence to trust themselves with their digital possessions. In our view, this approach entails taking peoples practical real worldly reasoning seriously, and not treating that reasoning as somehow an epiphenomenon that needs to be disregarded or even ignored. It seems to us that in much of the debates about trust (and latterly and trust and the cloud) this reasoning is eschewed. We hope our evidence shows how complex, subtle and practical this reasoning is. We hope to have shown also it is dynamic and reflective and that it is has psychological colour: this reasoning incorporates concerns to do with trust that resonate with personal doubt. These psychological concerns also, it should be clear, point back to the social, to a person's ability to act competently in the world at large.

It seems to us that if one looks at reasoning in this way, for its situated practical character, one will stop searching for essentials or reductive forms–if by that one wants some kind of logical computational property or psychological characteristic–a computational primitive in the manner of Gligor and Wing, say, or an aversion to rejection in the manner of Fehr (see also Quervain et al, 2004). Or rather one might say that there are essential characteristics to this reasoning, but they are not of this kind. For what we have seen is that in the world of practical action there are only real problems to do with things that are at hand. Ways of dealing with these things force us, sometimes, and often with regret, to make corrigible what was hitherto taken for granted, a basic premise. So, for example, it is sometimes difficult to know what possessions are if one can't identify where those possessions are; similarly it is sometimes difficult to know what a thing one possess is if the social life of that thing surrounds it with properties that makes that social skin pregnant with competing claims of possession. Thus one comes to doubt what a thing is. These are indeed essential concerns, ones dealt with rationally, carefully, pragmatically even when put this way they seem grotesquely abstract and philosophical. But rational action is always driven by the logic of the situation: if one cannot fathom what a thing is, perhaps one ought to reconsider what a thing might be. This is not a Kantian question, simply the concern of someone interacting with Facebook.

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