Taking Technomethodology Seriously: Hybrid Change in the Ethnomethodology-Design Relationship *

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Abstract

The incorporation of ethnomethodology in professional systems development has prompted the call for the approach to move from design critique to design practice and the invention of the future. This has resulted in the development of a variety of mixing pot hybrids that have had marginal impact upon product-based development, whose needs the approach has been configured to meet. This paper suggests that a concern to fit ethnomethodology into product-based development life-cycles is a primary source of the difficulties encountered in moving ethnomethodology from design critique to design practice. In practice, ethnomethodology is largely employed in research rather than product development settings. Recognition of the real world uses of ethnomethodology in design practice opens up the possibility of devising a hybrid methodology that actively supports the invention of the future. Accordingly, this paper articulates a distinct socio-technical model that provides an iterative structure for the constructive involvement of ethnomethodology in processes of technological *innovation*, the results of which may subsequently be subject to the rationalities and constraints of product development.

Keywords. Ethnomethodology, design, hybrid discipline, technomethodology, socio-technical model of design.

INTRODUCTION

Ethnomethodology has been involved in IT research for twenty years. Initial involvement in design centered on the mismatch between computer applications and the real world, real time circumstances of their use (Suchman 1987). In this respect, ethnomethodology's original purchase was a critical one, drawing attention to the failings of psychological models on which design was predicated, and the need for design to be responsive to the social circumstances of work within which IT systems are embedded in their use. This early involvement resulted in the 'turn to the social' in IT research (Grudin 1990, Hughes et al. 1994), where the challenge became one of understanding the collaborative character of work and prompted ethnomethodology to move from "design critique to design practice and the invention of the future" (Button and Dourish 1996).

In the course of pursuing this agenda ethnomethodology has risen to some considerable prominence under the general auspices of 'ethnography' (Crabtree 2003), particularly in the field of Computer Supported Cooperative Work (CSCW). Here the ethnomethodology-design relationship has largely been cast in terms of product-based design practice, and particularly in terms of requirements analysis and systems evaluation (COMIC 2.1). This movement into design practice has been accompanied by calls for ethnomethodology to make compromise over its strong programme of social science research (Shapiro 1994). Compromise is essential in a design context it is argued and so efforts have been made to integrate a softer, more user-friendly version of ethnomethodological inquiry with other approaches to design, such as Participatory Design or Cognitive Ergonomics (Shapiro 1995, Bannon 1998, Suchman 1999). These hybrid forms seek to cherry-pick and combine core disciplinary concepts and practices for the practical purposes of design. They are *mixing pot* hybrids that seek to adapt ethnomethodology and incorporate it into a mélange or bricolage of competences configured to meet the demands of product-based design.

Mixing pot hybrids are not hybrids in a strong ethnomethodological sense of the word. They configure ethnomethodology in a *service-provider* role having little or no strategic value or impact on design practice (Sharrock 2000). This is at odds with Harold Garfinkel's ambitions for ethnomethodology (2001a) which, in a design context, are summed up succinctly by Graham Button and Paul Dourish (1996):

> … rather than have systems design and ethnomethodology 'reach' towards each other and 'meet' at a design, we instead look to forge more foundational relationships, and then approach design from a new position. This foundational relationship is one in

which design adopts the analytic mentality of ethnomethodology, and ethnomethodology dons the practical mantle of design.

Mixing pot hybrids suspend the concern of ethnomethodology's strong programme to forge a foundational relationship and approach design from a new position. Instead, emphasis is placed upon "reaching" out towards each other to "meet" at a design.

The purpose of this paper is to explore alternatives. Button and Dourish have previously identified three ways in which ethnomethodology might assume a constructive role in design practice and IT research more generally:

1. *Learning from ethnomethodologists.* This category refers to organization of the ethnomethodology-design relationship through the active involvement of an ethnomethodological researcher in the design process.
2. *Learning from ethnomethodological accounts.* This category refers to organization of the ethnomethodology-design relationship through use of ethnomethodological accounts, or written field reports and analyses of work.
3. *Learning from ethnomethodology.* This category refers to organization of the ethnomethodology-design relationship through the exploration of foundational ethnomethodological principles and insights.

Exploration of the third way in particular provided the strong possibility of the advent of a hybrid discipline: *technomethodology*.

While Button and Dourish explored the possibility by bringing ethnomethodological principles to bear on generalization and abstraction in design, unfortunately very little has been done to further technomethodology since. The aim here is to move beyond their considered though nonetheless early reflections. In doing so we shall revisit some of ethnomethodology's foundational principles. We begin by explicating what the notion of a 'hybrid discipline' means for ethnomethodology. This exploration requires us to consider the philosophical impetus of Edmund Husserl. We then work through the core ideas of 'sources of knowing' and 'structures of accountability' in a design context through a case study, resulting in the presentation of a socio-technical model of design that exploits the ethnomethodological notions of 'breaching experiments' and consulting 'perspicuous settings' to propel innovation in design. This model operationalises Button and Dourish's third way – i.e., it moves technomethodology on from reflecting on EM principles and insights to *exploiting* and *developing* them for the practical purposes of IT research.

THE EMERGENCE OF HYBRID DISCIPLINES IN ETHNOMETHODOLOGY

Like many sociological approaches, ethnomethodology has its intellectual origins in and in many ways draws on philosophy. Of particular relevance here is Edmund Husserl's *phenomenological* programme (Garfinkel 1967a). That programme draws and builds upon a distinction between 'positive' or scientific knowledge on the one hand and philosophical knowledge on the other. It is a distinction that underlies ethnomethodology's impetus to develop hybrid disciplines. Below we shall briefly outline the central points of Husserl's programme before moving on to consider ethnomethodology's treatment and use of that programme to motivate hybrid studies.

Husserl suggests that scientific knowledge originates from the 'natural attitude' where objects are 'given' in various ways to direct experience as objects-existing-in-a-world-out-there independent of the particular observer. This object-ive world of things (or Independent Galilean Objects in more formal terms) constitutes the epistemological focus and topics of the sciences, natural and human (of physics, astronomy, computer science, sociology, and the rest). The natural attitude of the sciences contrasts with the philosophical attitude, which seeks to establish how objective knowledge (not the objective world) comes into existence. The philosophical attitude is concerned, then, with the *possibility* of objective knowledge. To say that objective knowledge is, in the various technical ways of the individual sciences, 'given' by an object's availability to direct experience is not enough for Husserl. Like generations of philosophers before him, he wants to know how it is possible for objective knowledge *to be* given? More precisely, Husserl wants to know how it is possible for human knowledge to "make contact" with an objective world and so transcend subjective experience (Husserl 1999, Lecture II).

According to Husserl, we cannot appeal to the sciences to answer the question however, as the possibility of objective knowledge is taken for granted by them and so put *out* of question. This is not to say that the sciences do not encounter epistemological difficulties, but that the possibility of objective knowledge is not drawn into question by them: objective knowledge is always possible for the sciences, the abiding question and practical difficulty is through what formal procedures or methods? The question of how it is possible for human knowledge to make contact with an objective world has plagued philosophers for two thousand years and more, and led to a wide range of influential positions ranging from Rationalism to Relativism and, of late, to Social Constructionism (Hacking 1999), of which Husserl's approach may be seen as a species. Accordingly, the notion that the abstract formal methods and logic of science may be adopted as a solution to epistemological problems in philosophy is firmly rejected by Husserl:

> It is impossible to see … how operating with assumptions drawn from positive knowledge, no matter how 'exactly grounded' they are in it, can assist us in resolving the doubts generated by the critique of knowledge, or solve its problems. If the very sense and value of positive knowledge *as such*, with *all* its methodological arrangements, with all its exact groundings, has become [philosophically] problematic, then this effects every principle drawn from the sphere of positive knowledge that might be taken as a point of departure as well as every ostensibly exact method of grounding … Thus it is clear that there can be no talk of philosophy (which begins in the critique of knowledge and remains entirely rooted in such a critique) orienting itself to the exact sciences as a model, or that it is the task of philosophy to extend and perfect the work accomplished in the exact sciences according to a method that is essentially the same for all sciences. In comparison to all positive knowledge, philosophy … lies in a *new dimension*; and to this new dimension there corresponds a fundamentally *new method* which is to be contrasted with the 'natural' method. (Husserl 1999, Lecture I)

In saying this, Husserl is not denying objective knowledge and the achievements of the sciences – he is not entertaining the Sceptic or the Relativist - but asking what makes the transcendent achievements of the sciences possible?

Husserl is "indifferent" to the formal methods of the sciences as they take their objects to be transcendent, at the beginning of epistemology (1999, Lecture II). Some new method is required that allows the *possibility* of objective knowledge to be explored then. This new method is not one that seeks to make contact with the objects of science – as the formal methods of science already do this and do it well - but is instead intended to explicate the taken for granted foundations upon which those formal methods trade. More specifically, and as Husserl puts it,

> … what is unclear is the 'contact with a transcendent' that is ascribed to knowledge, to knowing … knowing is something other than the known object … How can I understand this possibility? Naturally, the answer is: I could only understand it if the relation itself could be given, as something that could be seen. (ibid.)

Again, the sciences may want to invoke formal methods here – to say that the relation between knowing and the known object is ostensively given and plain to see in the description of formal methods that provide for the practical observability and practical objectivity of a science's objects. But that will not do as formal methods accounts are indexical to (get their sense from and so trade on) a host of scientific practices devised to

make formal methods work (see Lynch 1994 for prime example; or Button and Sharrock 1995 in the context of computer science). Formal methods do not, therefore, adequately account for the foundational ways in which human knowledge makes contact with an objective world. As Lynch puts it,

> Methods and descriptions are certainly not useless, and learning to compose step-by-step instructions is an important point of scientific training, but such accounts do not provide the stable grounds for reproducing a practice. Although it is possible to reproduce an observation from a written description, a text can only allude to what eventually may count as a replication of the observation … It might be more advisable to say that methods accounts are part and parcel of the concerted practices that enable them to be descriptive and instructive. (1994a)

What formal methods accounts do achieve, and make available to critical review among a community of practitioners, is the objective *representation* of the objects of the sciences (Husserl 1970). The problem that Husserl has with this state of affairs is not the validity status of objective knowledge (again, that is for a community of practitioners to determine) but that the practical observability and practical objectivity of the objects of science is divorced from the "vital practices" whereby formal methods are made to work (ibid.). The practical observability and practical objectivity of the objects of the sciences is attributed to their formal workings instead. Thus, there is a foundational *gap* in our knowledge regarding the relation between knowing and the known object. A gap that consists of but ignores the vital (in the sense of being alive, enacted and essential) practices that provide for the production of objective knowledge: "the sources of knowing", in Husserl's words (1999, Lecture IV).

Explicating "Sources of Knowing"

Ethnomethodology is a sociological discipline that developed in serious part out of a concern to take Husserl's Phenomenological programme seriously.

> But not out of respect for the author's intentions … Consulting [Husserl's texts] consists of using results in hand of ethnomethodological studies … to misread them, deliberately and systematically so, as shop practice. A standing task of [this misreading] is to bring an understanding of Husserl's writings into accord with the work commitments of professional sociology and the social sciences to the problem of order. We understand by the problem of social order the seriousness with which social analysts are required in the day's work, and day-to-day, to specify the production and the accountability of phenomena of order in and as the immortal ordinary society,

> while requiring that the practical objectivity and the practical observability of immortal ordinary society, just *because* these are vexed issues, be consulted to settle all issues of adequacy. Among these issues is the omnirelevant issue of descriptive precision (Garfinkel unpub. manu. #1)

Husserl's concern to set aside formal accounts and attend instead to unexplicated sources of knowing, or the *lebenswelt origins of the sciences* in more complicated locution, provided a potential solution to the perennial problem of descriptive adequacy that besets the social sciences. In being recast in terms of the problem of social order - which is concerned with the non-random, regular, recurrent, organized or coordinate character of social life – the phenomenological programme raised the possibility of producing objective sociological knowledge of the sciences and more mundane structures of practical action and practical reasoning making up the society at large (Douglas 1973).

In being recast in terms of the problem of social order, the phenomenological programme is extended to address not only the sources of knowing in the sciences but the myriad fields of practical action that make up the society at large. Thus, the programme is extended to address the sources of knowing in social science research (Garfinkel 1967b), jury deliberations (Garfinkel 1967c), coroners' courts (Douglas 1967), police interrogations (Wowk 1984), medical diagnoses (Gill and Maynard 1995), systems design (Button and Sharrock 1994), and any other practically observable and practically objective area of social life. The phenomenological programme must be misread, however, not only in the sense that it must be made answerable to the problem of order, but also in light of the fact that the vital practices that give rise to the sciences and more mundane structures of practical action and practical reason are not available to the philosophical method of phenomenological reduction.

Husserl's "sources of knowing" are only empirically available and cannot be "imagined", no matter how erudite and considered the form.

> Just-in-any-actual-case immortal ordinary society is a wonderful beast. Evidently and just in any actual case, God knows how it is put together. The principal formal analytic devices currently in hand, of paying careful attention to the use, the design, and administration of generic representational theorizing – models, for example – get a job done that with the same technical skills in administering them lose the very phenomena that they profess … [The] immortal ordinary society evidently, just in any actual case … is only discoverable. It is not imaginable. It cannot be imagined but is

> only actually found out … The way it is done is everything it can consist of and imagined descriptions cannot capture this detail. (Garfinkel 1996)

Ethnomethodolgy is unique among the social sciences in its wholesale rejection of what Wittgenstein (1979) called "this stupid superstition of our time", namely that objective accounts can only be furnished through generic representational theorizing. Instead, ethnomethodology takes it that the solution to the problem of order lies in the *structure of accountability* providing for an object's production and recognition or its practical observability and practical objectivity (Garfinkel and Sacks 1970; Garfinkel and Wieder 1992); and this includes the objects of the sciences when and where they are subject to sociological study (Garfinkel 2001b). The notion of accountability means that an object's practical observability and practical objectivity is provided for by the orderly features of its production and recognition, features which are themselves observable and reportable and thus available to sociological description. An example may serve to clarify the matter.

Structures of Accountability

On the evening of January 16th 1969 the astronomers John Cocke and Michael Disney detected "strong optical pulses" emanating from the Crab Nebula. Their observations led to the discovery of the Independent Galilean Object: Pulsar NP 0532 (Cocke et al. 1969). The night's work leading to this discovery was recorded on audiotape and placed on file at the American Institute of Physics. Some years later, the tape was examined by Harold Garfinkel, Mike Lynch and Eric Livingston for its accountable properties (Garfinkel et al. 1981). The purpose of this examination was to specify how the pulsar came to be known as an objective, actual and true feature of an astronomical universe that is demonstrably out there. More precisely, Garfinkel et al. set out to specify how Cocke and Disney's observations evolved from identifying a vague object-of-sorts, which had neither demonstrable sense nor concrete astronomical reference in the first instance, to identifying a transcendent Independent Galilean Object available to the scrutiny of the wider scientific community.

The following edited conversational excerpts are taken from a series of Observations (which is spelt with a capital letter to indicate the occurrence of discrete scientific episodes) made by Cocke and Disney on the night of the 16th of January at the Steward Observatory, Arizona. It is over the unfolding series of these Observations that a vague object-of-sorts comes to assume its demonstrable status as an Independent Galilean Object for astronomy. The question is: how? What is it about Cocke and Disney's

Observations that provide for the discovery of a practically observable and practical objective pulsar?

> Observation #18.
>
> M^{c}Callister: There's a nice dip on the side of that sky. I'm going to turn this thing down [adjusts the oscilloscope].
>
> Disney: We've got a bleeding pulse here.
>
> Cocke: Hey! Wow! You don't suppose that's really it, do you? Can't be.
>
> Disney: It's right bang in the middle of the period. Look, I mean right bang in the middle of the scale [on the screen]. It really looks like something from here to at the moment to me.
>
> Cocke: Hmm.
>
> Disney: And it's growing too. I won't believe it until we get a second one [pulse].
>
> Cocke: I won't believe it until we get the second one and until the thing has shifted somewhere else [on the horizontal axis of the screen].

In this sequence of talk, and through the use of the equipment to-hand, "a nice dip on the side of that sky" reveals a "pulse" but it is not a given pulse, not a practically observable and practically objective pulse, but a dubitable pulse, one whose facticity, which although suspected, is doubted at this point in time. The pulse represents a potential Independent Galilean Object, which in the current flow of their talk assumes the status of a vague object-of-sorts: an object whose facticity stands in need of verification. Consequently, Cocke and Disney formulate technical conditions providing for the prima facie facticity of the object to-hand. These conditions include #1) reproducing the Observation such that a second pulse is detected, and #2) looking for a shift in the object's on-screen representation. This latter condition is predicated on their working knowledge of the equipment and the commensurate suspicion that the visibility of the object "right bang in the middle of the scale" may be a technical bogey: a subsequent correct reading should place the object elsewhere on the screen.

> Observation #19.
>
> Disney: Beginning.
>
> Disney: My God, it's still there. It's as good as it was, or better than it was last time.
>
> Cocke: It disturbs me, that's right in the middle of the screen.
>
> Disney: It isn't John, look.
>
> Cocke: It's moved a little bit.

M^{c}Callister: If you get the right frequency then it'll be more or less the same place, wouldn't it?

Disney: It should be more or less, you won't be exactly the same place.

Disney: That's a bloody pulse isn't it.

Cocke: Let's move off that position and do somewhere else and see if we get the same thing. I hope to God this isn't some sort of artefact of the instrumentation.

In this sequence of talk, the astronomers try to reproduce the prior observation subject to the technical conditions they have specified. Condition #1 is readily satisfied in this Observation, indeed it's "better than it was last time". The satisfaction of Condition #2 is still in dispute, however. Although the on-screen representation of the pulse has shifted a little, it is not enough to determine whether or not the pulse is "some sort of artefact of the instrumentation". Judgements as to the facticity of the object to-hand are suspended and a further technical condition is formulated. Condition #3 specifies moving the telescope (.25 of a millimetre northwards). This positional check confirms that the equipment is working properly and results, in the following Observation, in the reproduction of the pulse and a shift in its on-screen position corresponding to the movement of the telescope: a pulsar has indeed been detected.

Observation #22.

Disney: We should be able to work out how many photons coming in per second to this pulse, right?

Cocke: Well, we should be, yeah.

Disney: Can we get the actual number; can we read off digitally the number of photons in each channel subsequent to this?

Cocke: Oh yeah.

Disney: Now the fun begins, we've got to write out some sort of programme to reduce this tape and have the whole lot go in so

Cocke: I don't think we need to reduce the damn tape.

Disney: No.

Cocke: We have – we'd have to reduce the tape only if we saw nothing or just a bare little hint of something.

Having established the facticity of the object to hand, the astronomers formulate ways in which the Independent Galilean status of the object (Pulsar NP 0532) may be publicly verified by other members of the astronomical community. In order to achieve this, they examine their data for its measurable properties (such as photons per second). With these

exact measures, other astronomers may reproduce the observation, and in the technical ways of their discipline, see Pulsar NP 0532 for themselves.

It is not the intention here to give an exhaustive account of how Pulsar NP 0532 was discovered, but to provide an illustrative example that allows the explication of several significant analytic points that define ethnomethodology's programme with respect to the study of science and more mundane fields of practical action and which give the notion of a hybrid discipline its practical sense and relevance. Accordingly, the following observations emerging from the study of the discovery of Pulsar NP 0532 are offered for consideration.

1. Cocke and Disney's discovery of the Independent Galilean Object: Pulsar NP 0532 could, like a great many social activities scientific or not, be made out to be organized in accordance with a predefined schedule of work or a *plan* – a schedule of research, governed by discrete protocols, confirming or refuting a hypothesis, etc. In Cocke and Disney's case, their discovery could be made out to be the product of an astrophysically cogent, mathematical collection of equivalent observations in and across the sequence of their successive Observations. The problem with such an account, however and as Garfinkel et al. (1981) put it, is that the

> … mathematical collection of equivalent observations is at one and the same time inviting and misleading. It is inviting because that they are making such a collection is prominently obvious in the tape and log. For instance, each observation is announced at the outset as one in a numerical series of successive observations, settings on the instruments are recorded, and mention is made of how the observations will be a repeat of or check on previous observations. The mathematical collection is obvious too in their article where they display their first chart recorded case of a pulse as an icon for the class of pulse it names. But it is misleading, because it is also prominently obvious in their tape and log, but noticeably absent from their article, that their collection, when it is examined in light of first time through [i.e., in light of their Observations-being-done], was obtained, and was only exhibitable, case-after-case, as a historicized series. The series was done as a lived orderliness, in real time. Only as a feature of its local historicity did the series project as its possibility that it could become an atemporalized collection of measurable properties of pulse frequency and star location that according to a Galilean science are independent of the local practices as of which just this gathering of observations was composed.

It might otherwise be said that although the discovery of Pulsar NP 0532 could be made out to accord with a plan, that discovery was not, in real time, the actual product of a plan but of the undocumented local practices upon which a collection of atemporalized mathematical properties relied upon for their production. Plan-ful accounts ignore the *lived orderliness* whereby a plan is realized in real time then (Suchman 1987), and so ignore Husserl's vital practices and real world sources of knowing.

2. It is plainly observable in the lived orderliness of Cocke and Disney's discovery that Pulsar NP 0532 is an *accountable object* – i.e., in the various technical ways of its production and recognition, it is an observable and discourse-able object. From its initial identification as a vague object-of-sorts through to the possibility of it being an artefact of the instrumentation to its verification as an object-that-is-actually-out-there-in-the-world, the pulsar is at all times available in and through their talk. This is not to say that the objects of the sciences are simply objects of talk.

> It needs to be remembered that Cocke and Disney don't discover an account of the pulsar; they discover an astronomically demonstrable pulsar. (Garfinkel et al. 1981)

It is to say that the objects of the sciences and more mundane reasoning are given to, and constituted in, human knowledge through talk: a much neglected instrument that is available to all speakers of a natural language and not restricted to scientists of whatever form.

3. The accountable givenness of an object makes an *observable structure of work* that provides for the object's production and recognition available to description. Pulsar NP 0532 is at all times and in all ways given through Cocke and Disney's talk. That talk makes a structure of work visible, in this case, in details of their Observations.

> [T]he pulse takes 'shape' in and as of the way it is worked, and [over the course of their Observations] *from* a place-to-start with [a vague object-of-sorts] *to* an increasingly definite thing [an Independent Galilean Object: Pulsar NP 0532] (Garfinkel et al. 1981)

Thus, the objects of the sciences and more mundane reasoning come to assume their practically observable and practically objective status through the accountable structure of work implicated in an object's production and recognition.

4. The accountable structure of work providing for an object's production and recognition is reflexively produced and locally organized in and through *concerted social interaction* or cooperative work. In the case of Pulsar NP 0532, this interactional work consists of

such observable local organizational things as: initiating new Observations, formulating verification conditions, checking the reliability of equipment, and working out measurable criteria providing for public verification, for example. It is only and entirely in and through this interactional work, which consists of locally organized courses-of-action or local work-practices reflexively constitutive of an object's accountable structure (e.g., the unfolding series of Observations in detail), that a vague object-of-sorts comes to assume its Independent Galilean status. This work is systematically stripped away from the formal account, however, and slimmed down to measurable properties, etc., so ignoring original sources of knowing. Formal methods accounts are offered instead and the practical competence required to employ those methods to locate the object described is assumed rather than specified. This is not a complaint, simply an observation, and one that gives Lynch's insight (that "methods accounts are part and parcel of the concerted practices that enable them to be descriptive and instructive") its precise sense.

5. The interactional work-practices in and through which an object's accountable structure is locally organized, and whereby an object comes to assume its practically observable and practically objective status, consists of an unexplicated *vulgar competence*, ordinary expertise, or practical reasoning (as evidenced, for example, in the artful ways in Cocke and Disney 'go about' formulating verification conditions, check the reliability of equipment, or work out public verifiability measures, etc.). Through the exercise of this competence, embodied in their interactional work-practice, a vague object-of-sorts that may be an artefact of the instrumentation comes to assume its demonstrable status as an object-out-there-in-the-world. This accountable structure of interactional work-practice is not incidental to the production and recognition of the object but thoroughly and indispensably *intertwined* with its practical observability and practical objectivity. It might otherwise be said that the objects of the sciences and more mundane fields of practical action are *potter's objects*, whose practical observability and practical objectivity is bound up with the interactional work-practices that make them visible and available to human knowledge.

This is not to say that such things as pulsars only exist as a result of human practice - that human practice casts and recasts the real world of things concrete. Rather, it is draw attention to what we already know but too often forget, namely that the real world of things concrete only exists *for human beings* as a result of human practice, and as practice changes so does our understanding of the real world of things concrete. Thus, the objects of the sciences and more mundane reasoning are said to be potter's objects: objects which

are accountably constituted and 'known' in and through human practice. Understood as potter's objects, the relation between knowing and the known object may be specified in orderly details of undocumented, work-site specific, concerted interactional practices. It is the recognition of this irremediable relationship, taken for granted and ignored by the sciences, that underpins ethnomethodology's programme and provides for the notion of a hybrid discipline.

Hybrid Studies

Points 1-5 above describe the 'missing interactional what' of organizational studies, which it is ethnomethodology's standing task to address:

> Harvey Sacks speaks of a curiosity in the work and history of the social sciences: the 'missing interactional what' in lay and professional studies of organization. Several observable phenomena make specific what he is talking about. 1) Available for observation is the omnipresence of accountable organizations of commonplace activities like 'families', 'faculties', 'traffic', 'welfare agencies', 'hospitals', 'manufacturing plants', 'city governments', or 'street gangs'. 2) It is a matter for observation too that endlessly many inquiries accompany these accountable organizations as constituent features of them. It is to be observed in these accountable organizations and their inquiries that the occasioned, embodied, interactional just-so and just-what of ordinary activities remains … ignored, unknown, unsuspected, and unmissed as technical phenomena. 3) Finally, there is to be observed that 1) and 2) taken together compose a technical phenomenon that is discoverable, is consequential, and for the study of naturally organized activities is criterial. The phenomenon consists of the essential, used, and ignored relevance to the collaborated production of the orderliness in, of, and as ordinary activities, of the occasioned, embodied, interactional just-so-and-just-what of ordinary activities. (Garfinkel unpub. manu. #2)

Ethnomethodology's programme is concerned to explicate the missing interactional what, where the 'what' of the matter consists of describing the local work-practices whereby an activity's objects are produced and recognized. These vital concerted practices are nowhere described in the peer-reviewed literatures of the sciences, natural and human, as accounts of objects are invariably rendered in formal terms rather than in observable details of their real time production and recognition. However, it is the explication of these indispensable but ignored work-practices that raises the possibility of creating hybrid disciplines.

The notion of a hybrid discipline gets its purchase from ethnomethodology's concern with the missing interactional what of organizational studies and the consequences that programme has for the social sciences. In the first instance, the programme demands that the social sciences abandon classical accounting practices – theorizing, modeling, and other means of formalizing their objects of study – and instead explicate, through close and careful description, the interactional work-practices implicated in an object of study's production and recognition (Garfinkel and Sacks 1970). In response to this injunction it has been suggested that ethnomethodology might provide a corrective to classical accounting practices in furnishing a "natural observational base" for the social sciences and thereby sensitize a wide variety of academic disciplines to "core practices of occupational worlds" that may subsequently be rendered "into objects suitable for treatment in the accounting practices of professional social science" (Heritage 1984). However, and in the second instance, this is precisely what Garfinkel *eschews* – adopting an alternate approach to social science study, and then attempting to synthesize it with classical forms, is not what Garfinkel means when he speaks of a hybrid discipline (Garfinkel 1996).

Rather than adapt the social sciences through the widespread adoption of an ethnomethodological programme of study, Garfinkel recommends the creation of hybrid disciplines *instead*. Following this programme would see ethnomethodological studies conducted for the practical purposes of the social activity whose workaday objects are under study rather than for purposes of social science. Thus, and for example, Garfinkel's students have undertaken ethnomethodological studies of mathematicians' work, legal work, and pediatrics, etc., with the intention that their studies will contribute to the ongoing development of the occupational practices in question, rather than contribute to the development of social science understandings of those practices. The implications of the hybrid programme are radical and transformative, as it *dissolves* the social sciences into innumerable hybrid disciplines each configured to support the professional bodies that furnish their objects of study (Lynch 1994b). As Livingston and Garfinkel (unpub. manu.) describe the hybrid programme with reference to the study of mathematics,

> [We want] to find out if it is possible to teach mathematical theorem proving and mathematical discovery *as practical action* [in contrast to *as* an abstract body of formal operations] … If it *is* possible to teach naturally accountable proving [i.e., proving in details of its lived orderliness] … it will inhabit the room of instruction; it will be the thing that students and teachers will be increasingly elaborating and making available in increasing technical detail to one another … [So the aim of the

> hybrid programme in mathematics will be to] develop an increasingly effective pedagogy … [which stands] against rival and traditional pedagogies … The radical consequence of this work is not only that high school students are capable of being instructed in the lived work of mathematical discovery and theorem proving, but that it is possible to teach discovering work in a natural science - that is, to teach discovering science as a science of practical action.

Whether or not ethnomethodology can provide an effective pedagogy in mathematics and natural science more generally remains to be seen (Livingston 1986). Nonetheless, the intention of the hybrid programme is clear: it is to inform the ongoing professional development of occupational practices whose workaday objects are under 'praxiological' study (Garfinkel 1996). This is what the notion of a hybrid discipline means generally speaking.

In the context of IT research, the hybrid programme requires that we subject the objects of computer science – computer-based systems, applications and devices – to ethnomethodological study. Distinctively, ethnomethodology does not study the objects of design as technical objects – as, for example, mathematical objects, or models, or structures of technical components, or in terms of systems functionality manipulated by 'users', who for design practitioners have a distinct technical make up of their own, which is expressed in such terms as parallel information processing, mental models, task-action functions, etc. Ethnomethodology is indifferent to these and other formal characterizations of the objects of design. In its engagement with design practice, ethnomethodology studies the objects of design as potter's objects, cast in and through accountable structures of interactional work-practices that are systematically stripped away from formal accounts in design as they are elsewhere. Ethnomethodology may be employed to inform design then, and so move from design critique to design practice, by explicating the lived orderliness of peoples practical engagement with the object's of design – i.e., by explicating *the intertwining* of people and computers - thereby elaborating the vital practices that computer use relies upon.

DEVELOPING A HYBRID APPROACH TO DESIGN

When considering how we might develop a hybrid approach to design the issue is not one of how we might 'reach out' and 'meet' at a design. Rather, the issue is one of how ethnomethodology and design might come together and develop a foundational relationship that allows us to approach design from a new position. In turn, this will enable us to address a curious situation that emerges from current mixing pot

configurations of the ethnomethodology-design relationship. Although configured to meet the demands of product-based design, ethnomethodologically-informed ethnography is widely recognized to have had marginal impact on industrial product development. While a great deal of effort has been spent tailoring ethnomethodology to meet the needs of product-based design, the vast majority of ethnomethodological work is *not* carried out in such settings but in research settings in universities and a few commercial laboratories. Here ethnomethodology may be configured in novel ways unconstrained by the demands of various product development life-cycles, and in ways that allow for *innovation* (the forerunner to product development) and the invention of the future.

The rationale at work in recent years at Lancaster University (e.g., http://escape.lancs.ac.uk), which has pioneered the use of ethnomethodology in IT research, and of late at the Mixed Reality Laboratory at the University of Nottingham (e.g., www.equator.ac.uk), is to leave design to its own devices in the first instance. To let technologists do whatever it is they want to do with whomever they want to do it with. To allow designers to be creative and build initial versions of potential futures as they and others see them. None of which is to say that the activities of designers in research settings are unconstrained, only that they are unconstrained by ethnomethodology at the outset. Ethnomethodology might enter the equation in the second instance, however, by subjecting novel technological creations and visions of the future to evaluation through the deployment of installations in real world settings and conducting ethnomethodological study of their real world, real time use. The notion of evaluation employed here is not to be understood in conventional product-based terms, as summative or formative, for example, but in a much more loose and *exploratory* sense. More precisely, it is to be understood as treating technical implementations as 'breaching experiments', where novel technologies are confronted by actual circumstances of use and, in their use, *provoke* (in the etymological sense of 'call forth' and make visible) a host of vital practices organizing interaction (Garfinkel 1967d).

The ethnomethodological notion of breaching experiments has recently been employed by Steve Mann (2003) in his remarkable exploration of computer wearables and surveillance technologies. Mann employs breaching experiments to actively create situations of uncertainty, bewilderment, anxiety and confusion in order to bring into question everyday structures of surveillance, governance, and control. Mann wants technology to empower users and he seeks to employ breaching experiments to make visible and so invert the power structure of networked surveillance. Mann's notion of a breaching experiment reflects a common reading of Garfinkel's work, where the

breaching experiment is construed of as a research procedure that necessarily disrupts ordinary action in order that the sociological analyst might "detect some expectancies that lend commonplace scenes their familiar, life-as-usual character, and to relate these to the stable social structures of everyday activities" (Garfinkel 1967d). It was no part of Garfinkel's program to use such experiments as political devices, however, to invert the power structure of surveillance or whatever else, but rather, to make the taken for granted ways in which "the structures of everyday life are ordinarily and routinely produced" visible and available to sociological reflection. "Making trouble" – or breaching everyday activities – was conceived of as one way in which the empirical study of social organization might proceed.

The emphasis placed on disrupting everyday activities is overstated, however, and even misleading if taken too literally. If we consider the breaching experiments reported by Garfinkel, for example, then it is clear that "bewilderment, consternation, and confusion … anxiety, shame, guilt, and indignation" are not essential features of the breaching experiment. While his students often reported these effects when carrying out breaching experiments, it is also clear that they were not *always* present on the occasions when the experiments were carried out. When medical students were asked to assess a "boorish candidate" at interview, for example, Garfinkel reports that 7 out of 28 subjects (25% of the experiment's population) did not realise they were the victims of a well-contrived deception until after the fact. Or again, when sociology students were asked to bargain for goods in shops, they reported that:

> they were enjoying the assignment [and that] they had learned to their 'surprise' that one could bargain in standard priced settings with some realistic chance of an advantageous outcome, and planned to do so in the future, particularly for costly merchandise (ibid.)

Hardly an occasion defined by bewilderment, consternation, confusion, and the rest. What is being suggested then, is that disruption is not a *necessary* criterion of the breaching experiment, though it may be sufficient.

Instead of construing of breaching experiments in narrow terms of sufficiency, however, the absence of necessity provides grounds to acknowledge the broader scope of the breaching experiment, one which goes beyond the "making of trouble" yet nevertheless respects the *spirit* of the procedure as conceived of by Garfinkel:

> [Breaching experiments] are demonstrations, designed, in Herbert Spiegelberg's phrase, as 'aids to a sluggish imagination'. I have found that they produce reflections through which the strangeness of an obstinately familiar world can be detected. (ibid.)

For Garfinkel, breaching experiments are *essentially* aids to a sluggish imagination. They may make whatever accountable structures of practical action are at work in a setting visible and available to reflection, and so raise them as essential topics of inquiry (essential in the sense that whatever the topics turn out to be, they are endogenous to the setting, they belong to it, are constitutive features of it and so, are indispensable). In treating novel technical implementations as *potter's objects*, breaching experiments become both a means and resource providing for the exploration of potential technical futures through the explication of accountable structures of practical action made visible in the intertwining of people and computers. Again, an example may serve to clarify the matter.

Breaching Experiment: The Distributed Legible City

The Distributed Legible City (DLC) is based on The Legible City, a 1990 multi-media art installation conceived by Jeffrey Shaw (1998). In its original form a single cyclist, seated upon a modified touring bike, pedals around three virtual cityscapes. The original work was situated inside a darkened room with the bicycle facing a large back-projected screen. The screen displayed the cyclist's view. The view was not of buildings and street furniture but instead, of solid coloured 3D letters forming sentences appropriate to the urban location. The virtual tourist was able to navigate between the cityscapes using an overview map and cycle around 3D representations of Manhattan, Karlsruhe or Amsterdam, taking in routes that reveal commentaries about the respective city or fragments of texts associated with the area. The text-forms were not solid and could, as such, be cycled through. The Distributed version of the Legible City retained these features and made them available to a number of users simultaneously. Adding avatars and real time audio feed, the DLC allowed a number of physically distributed persons to meet one another and explore a virtual space together.

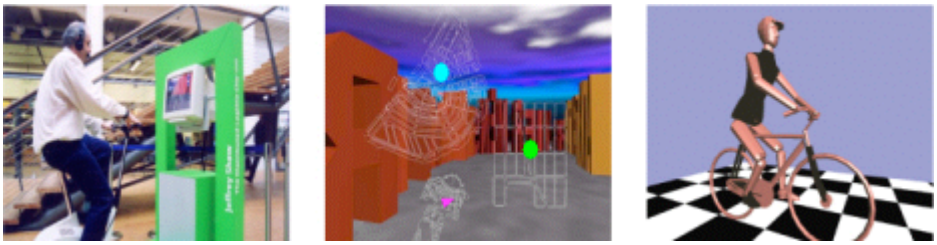

Figure 1. The Distributed Legible City

The design concepts underpinning the original environment sought to challenge the user's experience of space, place, and urban form and to explore the affordances of new technologies in relation to these phenomena. In addition, the DLC was intended to promote new forms of technologically-mediated sociality, with the text-forms promoting reasoning about the environment and collaboration in its exploration. Each of these objectives and their underlying phenomena could be, and were, accounted for through the application of a variety of disciplinary formalisms, whether from the conceptual arts, systems design, or psychology (eSCAPE D1.1, 1998). The object now (as it was then) is to suspend such formal workings, to exercise the policy of indifference and attend instead to the DLC as a potter's object whose social organization might be glimpsed in the breach.

The DLC was made available to members of the public at the ZKM Institute for Visual Media and a number of other public venues, including the IST 2000 Exhibition in Vienna and the official opening of the European Union's Fifth Framework programme at Essen, Germany. The extract below displays the accountable structure of practical action that reflexively provided for members use of the DLC in collaboration with the development team's demonstrator.

A Potter's Object: The DLC in Use (Edited Fieldnote Extract)

2. Demonstrator: So, just experiment a little bit riding around and

3. User: Yeah, OK (user starts pedalling).

4. Demonstrator: So you're in Manhattan, and the other cities are Amsterdam and Karlsruhe.

5. User: OK.

14. User: I want, I want to meet this person, so

15. Demonstrator: Just go up the street here (points in the direction of a visible "street" entrance).

16. User: Up this? (user turns towards a "street" to his left).

17. Demonstrator: Yeah, up that "street" here (points to the particular "street").

18. User: Up here? (user cycles into the“street”).

19. Demonstrator: Yeah.

20. User: OK. We should be able to meet each other?

21. Demonstrator: Probably, at the intersection.

22. Demonstrator: Just - straight ahead.

23. User: OK.

24. Demonstrator: Should be just around the corner there (points to a place on the screen).

Utterance 15. **Utterance 22.** **Utterance 24.**

25. User: OK. I can go down there? (user nods at a side street entrance he is cycling past).

26. Demonstrator: It should just be, may be here (points to a place on the screen)

27. Demonstrator: There! (demonstrator sees and points out another user’s avatar)

28. User: Oh yeah!

Utterance 27. **Utterance 28.** **Locating the other’s avatar**

Seen from the point of view of real world, real time interaction, the demonstrator and user did not account for the installation in terms of the formalisms of conceptual art, systems design or psychology. Nor was the installation accounted for in terms of its novelty as an artwork or a radical piece of technology. Instead, and for all practical purposes as observably embodied in their work together, the demonstrator and user accounted for the DLC and proceeded to interact with the installation in familiar commonsense ways, namely, in terms of an urban environment. In the accountable course of interaction and

the accomplishment of use, the DLC was not seen and understood as some radical environment challenging basic conceptions of space, place, or urban form then, but primarily, as a city (or more precisely, "cities"). The point is not a trivial one for with that mutual recognition a host of background expectancies were brought into play and utilised for practical purposes here and now of interacting with the virtual environment and more specifically, of "riding around" the "cities".

Having invoked the notion of "cities", the novelty of the virtual environment was ignored and users instead undertook action on the basis of the same logical premises they would employ in an urban environment. Utilising background expectancies normally and naturally employed in interacting with urban spaces, the DLC was seen and understood to consist of familiar material arrangements of place, such as "streets" and "intersections". Such arrangements are commonly known to have standard uses. Thus, the demonstrator and user invoked common notions of going "up" and "down" streets, and of going "straight ahead" or "just round the corner" at "intersections" in making sense of the actions they were together engaged in (i.e., "riding around" in order to "meet this person"). Just what is commonly known, then, is that material arrangements of space and place may be drawn upon and used to provide directions. Thus, the demonstrator and user employed common understandings of the arrangements of urban space to establish a mutual sense of where they were going and how to get there – "go up the street", "that street", "at the intersection", "straight ahead", "just around the corner", "go down here", "here", "there". It might otherwise be said that known in common background expectancies of the arrangements of urban space were employed by the demonstrator and users as a *scheme of interpretation* for engaging with the environment and getting their activities done. Although presenting users with a virtual environment consisting of novel textual arrangements which may be cycled straight through, the DLC was nevertheless oriented to by members of the public as a real world arrangement of urban space. That the DLC consisted of textual forms that could be traversed in novel ways was of no practical relevance to persons interacting with the virtual space. Instead, the DLC's textual forms were treated as if they were solid structures, and the spaces between them as highways and by-ways. Users cycled down and around the city streets, trying to avoid colliding with what for them were ostensibly buildings in their efforts to meet others in the virtual world.

While the focus of breaching experiments remains fixed on technology-in-use (Button 1992), their purpose is not one of conducting sanity checks or producing specific design recommendations. Rather, the aim is to explore the *sociality of novel design spaces opened up through the deployment of novel technology configurations in real world*

situations of use. The main outcome of these studies is to identify and draw attention to important features of social interaction implicated in technology usage. Attention to the accountable structure of practical action revealed in the breach and by treating technical installations as potter's objects cast in and through participants interactions provides us with a glimpse of the indispensability of appropriate schemes of interpretation to interaction in virtual environments, for example. Seen in the breach – in confronting members with unfamiliar technologically-mediated events – we are instructed as to the gross relevance of appropriate schemes of interpretation to interaction with virtual worlds. The breaching experiment does not specify a design solution, however, but raises schemes of interpretation as a topic relevant to design and one deserving of further inquiry.

Beyond the Breach

Topics identified in the breach may be further investigated in two interrelated ways. In the first instance, topics might be fleshed out through the study of 'perspicuous settings' (Garfinkel and Wieder 1992). Perspicuous settings are real world settings where the topic in question is a prominent feature of the day's work. The study of such settings allows researchers to investigate topics seen in the breach in more detail. Like ethnographic study more generally, the study of these settings requires the immersion of a researcher in the work of a setting. This need not be a prolonged exercise, however. "Quick and dirty" ethnographies (Hughes et al. 1994) often suffice and are preferable over long periods of immersion as the point is not to conduct social research for its own sake, but rather, to engage ethnography *with* design.

In the case of investigating schemes of interpretation seen in the use of the DLC, for example, studies were subsequently undertaken in a Tourist Information Centre (TIC). Daily work at the TIC is marked by a concern to help people find places they wish to visit in the real world and investigation of this perspicuous setting enabled the design team to explore other schemes of interpretation implicated in way finding to those seen in the breach and to explore the potential relevance of such schemes to way finding in the virtual world (eSCAPE D4.2, 1999). The studies resulted in the design of the Tourist Information Demonstrator, a topographical virtual environment that allowed users to enter queries and which 'deformed' in response to highlight locations fitting the query (see Figure 2, for example). In turn, the demonstrator was deployed in a real world setting – a TIC, to be precise – and subject to ethnomethodological study. The study showed that although the prototype supported users efforts to find places of personal relevance it was of limited utility. The limits of the matter revolved around the range of content provided by the

environment and brought to light the need to enable users to construct virtual environments through the addition of content.

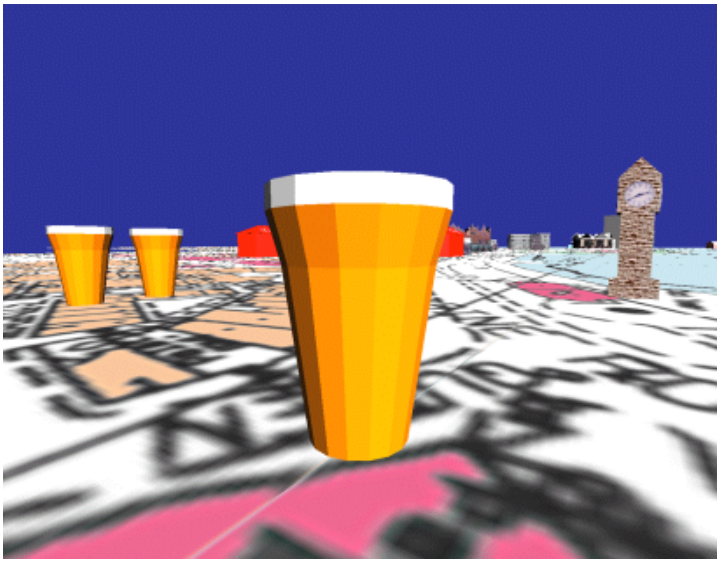

Figure 2. The Tourist Information Demonstrator
(Finding public houses in the electronic landscape at-a-glance)

Another quick and dirty study was subsequently undertaken of a perspicuous setting – a mixing bay in a university department - to develop an understanding of some of the ordinary ways in which public places are accountably constructed in the practical activities of inhabitants (eSCAPE D4.4, 2000). The study further elaborated schemes of interpretation in terms of familiar perceptional and representational structures of place. Thus, and for example, places are perceptually constructed in terms of familiar representations such as 'streets' and street furniture such as 'signs' and 'billboards', and 'buildings', and office furniture such as 'shelves', 'filing cabinets', and 'desktops', etc. Again, in turn, the study led to further design providing 1) an object library for the importing of familiar representations by users to construct content-filled places of their own; 2) an editor to support the 'invisible' work implicated in the behind the scenes management of public spaces, such as updating the information contained in particular representations, adding new representations, and in making changes to the fabric of the overall space or sections of it; and 3) an access model enabling users to grant rights and privileges to others such that they may add and edit content. Thus, through an iterative process of design→real-world-deployment/breaching-experiment→study-of-perspicuous-setting→design, ethnomethodology has come to play an active and constructive role in IT research, not by specifying requirements but by providing *techniques and resources to explore and reason about the sociality of the design space*. In turn, these techniques and

resources have inspired the development of "collaborative access models" which are propelling the next generation of 3D environments that move "beyond mere exemplars of computer graphics techniques, [to] evolve more meaningful content" (Pettifer and Marsh 2001, Cook and Pettifer 2001).

Ethnomethodology's role in IT research is primarily one of informing the development of abstract design concepts (Crabtree and Rodden 2002). The notion of 'developing a concept' is a gloss on a polymorphous assemblage of cooperative work that takes place between ethnographers and other design partners. Stable features of the polymorph consist of employing ethnomethodological studies to flesh out abstract design concepts, not to specify system requirements or evaluate existing functionality. The development of the DLC and Tourist Information Demonstrator, for example, are concrete instantiations of the abstract design concept 'electronic landscapes' or eSCAPEs devised by artists and designers. Informing the development of abstract design concepts is a very different kind of activity to specifying system requirements. It is concerned to establish over the course of time, design, and study, a mutual understanding of the stable social characteristics of future technologies (characteristics such as the indispensability if schemes of interpretation to electronic landscapes, for example). Just how emergent, shared understandings of design problems are resolved technically is *not* ethnomethodology's concern in this configuration of the ethnography-design relationship, but the task of a technical staff. In the early stages of design this means that social and technical viewpoints are quite divergent. The two come to be aligned through studies identifying phenomenon of topical relevance, which designers construct solutions *to explore* and so extend the potential of new and emerging technologies This reconfiguration of the relationship between ethnomethodology and design leads to a development model where technology becomes a *vehicle for social research*, the results of which in turn propel innovation through *technological exploration of social phenomenon* initially seen in the breach and subsequently fleshed out through the consultation of perspicuous settings.

Using ethnomethodology to do what it does well – to identify through rigorous scrutiny of empirical events sociological topics which may further investigated to flesh out abstract design concepts – provides a strategy that lies at the heart of a hybrid relationship between ethnomethodology and design in its strong sense (i.e., as advocated by Garfinkel, and outlined by Button and Dourish). Unlike mixing pot hybrids it does not require that ethnomethodological studies be done and then attempts be made to relate or link those studies to technical specifications. Rather than attempt to make ethnomethodology answerable to the technicalities of design (a largely unsuccessful effort

to date), this alternate approach eschews product-based configurations of the ethnomethodology-design relationship and seeks instead to support innovation through explicating the accountable structures of practical action seen in the breach, which the use of future technologies observably relies upon. This is a highly economical and efficient use of what is often considered an expensive and time-consuming approach. It requires only short periods of study. Furthermore, in advocating the exploration of topics seen in the breach through quick and dirty study rapidly followed by further technological exploration, it is a strategy that puts technology at the centre of things. It is a strategy in which technological innovation is driven incrementally through the development of technology and the subsequent study of its essential social properties, and so provides for the development of future technologies that are well grounded in and responsive to the social circumstances of their use. It is a transformative strategy which provides a socio-technical model of innovation where technological research drives sociological inquiry of the interactional work implicated in the use of technology, and the accountable structure of interactional work, in turn, drives technological development. There is no attempt here to "reach" out to the parties involved in development and "meet" at a design, no compromise of ethnomethodology's strong programme of research here, but instead, the incremental technical exploration of the essential social properties of the innovative design spaces constructed by designers and others. This model is not used to negotiate, reformulate, or specify requirements, then, but to propel exploration of novel design spaces through continued technical development addressing the social topics seen in the breach (Crabtree 2004).

INVENTING THE FUTURE: A HYBRID APPROACH TO INNOVATION

The incorporation of ethnomethodology in professional systems development prompted the call for the approach to move from design critique to design practice and the invention of the future. In various ways, this has resulted in the development of a variety of hybrid forms that compromise ethnomethodology's strong programme. These mixing pot hybrids seek to combine a softer, more user-friendly version of ethnomethodology with other approaches from various disciplines. While having some degree of success in an academic context, these hybrids have had only marginal impact upon product-based development whose needs they have been configured to meet. It has been suggested that a concern to fit ethnomethodology into product-based development life-cycles is a primary source of the difficulties encountered in moving ethnomethodology from design critique to design practice, however. The point of creating a hybrid discipline is not simply to take part in design but, pace Button and Dourish (1996) "to forge more foundational relationships,

and then approach design from a new position". Such a position is one that intends to open up the design space and propel innovation by exploring the social through technological development.

Rejecting the need to link ethnomethodology to product-based design (on the basis that the vast majority of ethnomethodological studies are carried out in research rather than product development settings), it becomes possible to devise a hybrid methodology that supports the invention of the future (in contrast to the construction of the future). This socio-technical model provides an iterative structure for the constructive involvement of ethnomethodology in processes of innovation in foundational IT research, the results of which may subsequently be subject to the rationalities and constraints of product development. The model is characterised by the following features:

1. Let designers build whatever they want with whomever they want, subject to their own constraints.
2. Deploy the objects of design in real world settings.
3. Treat deployment as a breaching experiment.
4. Explicate the accountable structures of practical action made visible in the breach.
5. Explore the topics identified in the breach through the study of perspicuous settings.
6. Use the studies of perspicuous settings to flesh out abstract design concepts.
7. Deploy the new design solution in real world settings and study its use.
8. Repeat the process until the research agenda has been satisfied for all practical purposes.

This hybrid model allows ethnomethodology to do what it does best – i.e., to study the social organization of practical action and practical reasoning – and not concern itself with the production of technical specifications. What does it mean for ethnomethodology to don the practical mantle of design then? If this paper has achieved anything then it is hoped it will be the recognition that design practice is not simply about product development; that design practice also involves fundamental research. The suggestion of this paper is that it is at the level of IT research rather than product development that the ethnomethodology-design relationship may best be configured. Donning the practical mantle of design consists, then, of taking research seriously. More specifically, it consists of taking technological concepts and visions of the future seriously; of exploring them concretely *through* design; through studying technological instantiations of abstract design concepts as potter's objects; through consulting perspicuous settings to further

explore topics seen in the breach and to flesh out underlying technical concepts. This, of course, raises the issue of how design might adopt the analytic mentality of ethnomethodology. The suggestion here is that the relationship might be fostered by moving the deployment of novel technologies out of the research lab and into *in real world settings* where their accountable use might be studied, and that the organizational topics identified in the breach, in turn, be *pursued through new technological configurations that are intentionally constructed to explore them.* Exploiting breaching experiments and consulting perspicuous settings in an iterative process of innovation moves us beyond reflecting on the potential value of ethnomethodological principles and insights to provide ethnographers and designers with techniques and resources with which to approach IT research from a new position where the exploration of the social and the technical are irremediably intertwined, or hybridized in a strong sense of the word.

ACKNOWLEDGEMENT

This research was funded by the Esprit Long Term Research Project 25377 eSCAPE. The author wishes to acknowledge the invaluable contributions of all the partners: AIG at The University of Manchester, ZKM in Karlsruhe, SICS in Sweden, and the Sociology and Computing Departments at Lancaster University. eSCAPE deliverables are available online: www.mrl.nott.ac.uk/~axc/homepage/publications.htm

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