Régimenes de diseño, lógicas de usuarios

Regimes of Design, Logics of Users

Alex Wilkie

Goldsmiths, University of London

a.wilkie@gold.ac.uk

Resumen

Este texto es una versión editada del capítulo introductorio de mi Tesis doctoral "*User Assemblages in Design: An Ethnographic Study*" La tesis fue supervisada por Mike Michael y Bill Gaver, y evaluada por Lucy Suchman y Matthew Fuller. El grado fue otorgado por la Universidad de Londres en octubre de 2010. Este texto expone la importancia y pertinencia sociológica de la realización de una etnografía del diseño y los usuarios. Al hacerlo, esbozo los fundamentos de la tesis, a raíz de perspectivas en STS, el enfoque empírico utilizado, así como las preguntas de investigación formuladas. Por último, presento un resumen de la tesis, incluyendo un breve resumen de la principal contribución teórica de la misma, a saber, el concepto de *user-assemblage*, basado en la obra de Deleuze y Guattari, y que contribuye a los desarrollos post teoría del actor-red.

Palabras clave: Diseño centrado en el usuario; Teoría del Actor-Red; Etnografía

Abstract

The following text is an edited version of the introductory chapter of my Ph.D. thesis 'User Assemblages in Design: An Ethnographic Study'. The thesis was supervised by Mike Michael and Bill Gaver, examined by Lucy Suchman and Matthew Fuller. The degree was awarded by the University of London in October 2010. This text sets out the sociological importance and relevance for conducting an ethnography of design and users. In doing so I sketch out the rationale for the thesis, following perspectives in STS, the empirical approach I undertook as well as the research questions I pursued. Lastly, I present a chapter outline of the thesis including a brief summary of the major theoretical contribution of the thesis, namely the concept of the user-assemblage, which draws on the work of Deleuze and Guattari and contributes to developments after actor-network theory.

Keywords: *User-centered design; Assemblage, Actor-Network Theory; Ethnography*

Introduction

This thesis is an ethnographic study of the many ways in which 'users' are employed in the practice of user-centered design (UCD). I take the perspective of Science and Technology Studies (STS) to examine how users mediate the relations between the social and the technological during the application of UCD principles in the corporate setting of a multinational microprocessor manufacturer. Thus, it is a study of the routine and practical techniques by which designers enrol, mobilise and deploy users in order to assemble novel Information and Communication Technologies (ICTs). I explore how users are involved in the material, aesthetic and technical innovation practices of designers, which contribute to the production of social and technological futures. The central argument of this thesis is that users are assembled along with the new technologies whose design they resource as well as with new configurations of socio-cultural life that they bring into view. Accordingly, I examine how designers mobilise people who live in North America and the ROW (Rest Of the World) to envision users and collectives coping with chronic diseases, managing health and fitness regimes, coordinating family digital content, and how they are electronically sensed as they go about their daily routines. In doing so I also describe how design practices are allied with the application of social science within industry and

entangled in the economic strategies of a multinational semiconductor manufacturer and dominant ICT innovator.

In this chapter, I orient the reader toward the research in hand, its sociological relevance and the questions and associated arguments I develop in this thesis. In doing so, I demonstrate how this thesis connects to, and builds upon increasing engagements within sociology and social theory with design as an inventive practice concerned with the production of novel configurations of people and technology. Here, the growing prominence of design in the imagination of government and corporations, whether in relation to public service provision, democratic processes, policy futures or consumer markets indicates a key development in how science and technology permeate everyday life. I outline how this connects with longstanding debates within STS emphasising the role of the user in the construction of scientific facts and technological objects. Furthermore, I point to how my analysis of UCD contributes to a growing body of literature within STS concerned with how different, and often competing, social and technological futures are designed and managed in the present. In doing so I demonstrate how this thesis also contributes to emerging perspectives of UCD (e.g. Shove, Elizabeth, Watson, Matthew, Hand, Martin, & Ingram, Jack, 2007, p. 132) as a relational practice in which various kinds and forms of users participate in the making of complex artefacts and experiences endowed with qualitative and affective traits. I draw this chapter to a close by providing an overview of the thesis, outlining the content and the development of my research questions pursued through empirical argument and theoretical reflection.

This thesis entails three principal empirical tasks with which I open up a core set of research questions and arguments relating to the role of users in UCD. The empirical tasks are as follows: (1) to trace the diverse forms and uses of the 'user' in user-centered design processes; (2) to examine how, in design practice, different and multiple versions of the user are brought into being and managed in relation to the invention and development of ICTs; (3) to identify the conditions under which the multiple versions and meanings of the 'user' are accepted or discarded. In sum, these tasks structure my empirical work and provide a basis for my examination of the involvement of users in UCD practices and the construction of visions that are at once social and technological.

Two key and interrelated insights derived from STS set the context for my research questions. The first states that user involvement in user-centered and participatory design processes includes more than simply humans as 'active' participants (Callon, Michel, 2004, p. 4). This approach to user-involvement is what John Law calls 'materially heterogeneous' (1994, p. 2) and recognises the participation of both human and non-human actors in UCD processes. The second insight, based on developments in actor-network theory (ANT), is that users themselves are occasioned in the design process as social and technological *assemblages* that operate to serve and mediate multiple and divergent interests. Thus, in following STS scholars who have argued that technical objects are heterogeneously composed unities of interoperable elements, this thesis seeks to address how on the one hand the rhetoric of UCD maintains distinctions between the human and the technological whilst in practice it is unreservedly engaged in the production of complex entanglements of the two. At the core of such entanglements is the figure of the user as a pivotal actor in technological development that is literally and theoretically situated at the interface between the social and the technological.

Accordingly, the following research questions arise from the empirical tasks outlined above: (1) how and in what form are users enacted in UCD practice? (2) What and whose interests do users serve to mediate

and how? (3) What forms of prospective people-technology configurations emerge and are deemed eligible in UCD practice?

Formulated as such, my research questions prompt me to follow a series of empirical and analytic directions in which I study the diverse identities, capacities and roles of users mobilised in design practice. In addition, I explore the varying relations between users, designed artefacts and designers' anticipation of future everyday practices. This brings me to a re-examination of critical questions concerning the politics of user-centered design. These, I am persuaded, concern the merger of the human and non-human where new actors are brought into being with specific characteristics, new capacities for action, new ontologies, new logics and rationales irreducible to categories such as person-user and technology (e.g. Berg, Marc, 1998; Foucault, Michel, 1975/1991; Hutchins, Edwin, 1996; Latour, Bruno, 1988b, 1991). Clearly, then, the contemporary application of UCD provokes questions that are familiar to STS (e.g. Berg, Marc, 1998; Garrety, Karin & Badham, Richard, 2004). And yet, at the same time the uptake of UCD principles and methods for the fashioning of consumer commodities, government services, the built environment, workplace infrastructure, and medical technologies suggests that these questions require reformulation and re-examination. In this context, the pervasiveness and agency attributed to design to change and inflect the material and qualitative circumstances of everyday life signals what might be characterised as a *regime of design* (Marres, Noortje, 2009, p. 126).

This thesis, then, examines users enacted in design processes as multiple in identity and composition and as such I investigate their various capacities to act, not limited to the representation of pre-existing persons and collectives. It is also about the extent to which the involvement and deployment of the user enables the enactment of futures within UCD, and how, as an upshot, people and technologies are made to count in the present.

Formative Preambles in Design and Sociology

This thesis has a back-story in my training and professional engagement as an interaction designer, beginning at the pioneering Computer Related Design masters programme at the Royal College of Art in the late 1990's. The research questions and arguments outlined above and discussed in detail in the thesis emerged, for me, out of the intersection of developments in the design of computer technologies and ongoing debates concerning the role of design and the designer therein: how, that is, interactive devices for use in everyday life should be brought into being in relation to the desires and needs of people. During this time I was witnessing the expansion of the Web as a site for commercial, cultural and political activity (e.g. Rogers, Richard, 2000) and the increasing inclusion of computational technology into the objects and spaces of everyday life, for example mobile computing and communications, domestic appliances and entertainment devices, interactive museum exhibits and so forth. Furthermore, the demands of my education and professional practice were that I, myself, design novel social and cultural applications for computational technologies afforded by such contemporary developments. Thus, I was trained and employed to participate as an interaction designer in the production of novel interactive technologies (including experimental search engines, data-base driven web sites, mobile phone software and data services, so called 'social software', wearable technology, trade show exhibits, online marketing, and workplace 'soundscaping' devices) in which various understandings of people, society and technology were made to matter. As I would later discover, my proficiency would prove to be instrumental

in identifying the topic of this thesis and gaining access to the field site where I conducted an ethnographic study of design practice.

One way to include people in the design process, and perhaps the most prominently advocated and commonly applied, is to identify and gain knowledge on who the prospective user might be and model the interactive, material and aesthetic qualities of the design on understandings of their circumstances and capacities. Although user involvement and participation in the design of technology has its roots in efforts to implement democracy in the workplace, as discussed in detail in the following chapter, its uptake in economic and public policy and its pervasiveness in corporate R&D and marketing activities is instrumental in rendering new relationships between, but not limited to: government and citizens, brands and consumers, patients and the provision of healthcare. Currently, the active and creative capacities of people-as-users are harnessed to inform, evaluate and stimulate people in affective relationships and economies.

There were, however, radical and competing versions of the putative user and their aesthetic experience, based by and large on particular disciplinary lineages in design that were converging in interactive design, for instance: industrial and product designers interested in the physical and embodied capacities of people; graphic designers concerned with people's symbolic and linguistic reasoning; as well as architects exploring users in social and spatial conditions. Although critiques of existing conceptualisations of people – as users – in design argued that people were reduced to 'cognitive clarity' (i.e. Dunne, Anthony, 1999, p. 23), the alternative models of users proposed seemed to me equally reductive. Here, for example, Anthony Dunne's commentary on human-factors and user-friendliness, as the generalisation and simplification of people and interactive artefacts in order to optimise and rationalise efficient interactions between people and computers, calls for an understanding of people as qualitatively social and cultural actors. However, the alternative models (see also: Margolin, Victor, 1997) in which people were conceived in equally humanist terms with innate faculties such as interpretive skills, psychological needs and desires seemed to mirror, if not extend, the very user-model being criticised. That is to say, Dunne offers an understanding of subjectivity that advanced an equally outmoded – essentialist and humanist view of users. In other words, Dunne views users as antecedent to and separate from technology despite post-structuralist trends within social theory, not least prior sociological developments within HCI itself. In addition, this view of users as qualitatively and psychologically complex, which designed artefacts supposedly respond to and enhance, inadvertently paralleled the contemporary role of design as understood and articulated in recent social theory. Here, design is viewed as an endeavour pre-occupied with enriching the qualitative experience of commodities – as engaging objects – for economic advantage. Such debates in design, however, did alert me to the emphasis placed on the user – a figure that lies at the nub of contested and divergent views on the role of design and designed artefacts so pervasive in everyday life.

Regimes of Design, Logics of the User

Meanwhile, social theorists were starting to acknowledge the critical role played by design and interactivity, pointing to their increasing importance in everyday life characterised by developments in science and technology. In the context of a renewed interest in contemporary forms of capitalism (e.g. Boltanksi, Luc & Chiapello, Eve, 2005) design is understood to play a critical role in the creation, production and staging of commodities (Callon, Michel, Méadel, Cécile, & Rabeharisoa, Vololona, 2002;

Thrift, Nigel, 2005, 2008), brands (Lury, Celia, 2004), services, and scientific knowledge in the public domain (Barry, Andrew, 2001) as well as its increasing prominence in economic policy. Central to such accounts is the role of innovation and creativity in producing *affective* objects and the active role of the people as a resource employed in such creative and inventive practices. One example of this is Nigel Thrift (2008, p. 39) who speaks of the design of consumer products as 'sensory design' where commodities are made to appeal to and entangle consumers via multiple material, visual and sensational registers. Moreover, Thrift (ibid. , p. 40) also recognises the increasingly important emphasis placed on 'user-centered innovation' in commercial product development. Interaction design, in this light, is redefined from a nascent discipline concerned with designing computer interfaces, to a contemporary design regime wherein commodities make available all kinds of sensual, material and semiotic interfaces between brands and consumers' everyday practices over and above instrumental and functional pre-requisites. On this score, the management consultants and experience economy boosters B. Josef Pine and James Gilmore (1999) narrate a plethora of experience commodities including Nike sneakers, Intel chips, the revamped Volkswagen Beatle, Harley Davidson motorbikes and soft drinks such as Coco-Cola as exemplars of commodities enriched with qualitative properties, experiences and service infrastructures. For Pine and Gilmore the aim of such commodity qualification is the maximisation of revenue and economic value and the chief instrument of experiential enhancements is design in its various specialisations.

Similarly, for Michel Callon, Cécile Méadel, and Vololona Rabeharisoa (2002), design now exists at the heart of economic activity. Here, the importance and prevalence of involving consumers in product development, whether through users, consumers or market research clouds normative distinctions between, for example, production and consumption, supply and demand. Not only that, but the 'positioning' of products, that is, their placement in the market in relation to competing commodities and brands, also structures and classifies the end user. In such economic activities, design is insinuated right across commercial organisations (Callon, Michel, et al., 2002, p. 212). Moreover, Callon et al. (ibid. , p. 213) argue that this economy of attribute matching, between product and consumer, is especially prevalent in the delivery of ICT mediated services. In this context, UCD allied with various forms of qualitative research, most notably ethnography in recent times, has become a key approach to commodity development in general (Barry, Andrew, Born, Georgina, & Weszkalnys, Gisa, 2008; Cefkin, Melissa, 2009; Norman, Donald A., 1988; Shove, Elizabeth, et al., 2007, p. 131; Thrift, Nigel, 2008, p. 47) and a widely accepted alternative to quantitative approaches in particular. Distinctive to design, then, is how it operates to bring together, or synthetize, different rationalities, for example qualitative market research, economic imperatives, as well as technological and material affordances in the production of commodities.

Rethinking Design with STS

My early encounters with STS, however, exposed me to very different accounts of conventional sociological registers such as 'society', 'people' and 'technology' that routinely operate in design discourse. Indeed, such distinctions are a central and contested topic of sociological and historical accounts of science and technology. With notions such as 'hybrid' (Latour, Bruno, 1993) and 'hybrid collectif' (Callon, Michel & Law, John, 1995), 'cyborg' (Haraway, Donna, 1991) and 'co-agent' (Michael, Mike, 2000b) I was persuaded that design, rather than making better technologies in order to meet the 'natural' qualities of humans or making technologies that impact and drive social relations is, in fact, a

practice in which people and technology are mutually reconfigured with new identities and new capacities. In short, humans and technology elaborate one another in practice. Two implications arise here: first, that humans and technology are mutually bound in defining one another and cannot be separated, purified (Latour, Bruno, 1993, p. 5) or bifurcated (Halewood, M, 2008, p. 2) into pre-existing and independent categories. What counts as the human or the technological are outcomes of design practice, not pre-conditions. Second, the building of new technologies is a thoroughly social process and vice-versa: technologies do not 'impact' society and people – both are mutually elaborated, hence terms such as technoscience (Latour, Bruno, 1988b, p. 29) and sociotechnical ensemble (Bijker, Wiebe E., 1999, p. 12), underscoring their co-dependency and reciprocal dynamics. This, it struck me, was especially germane for UCD and the stress it places on meeting human needs and delivering empowerment. Following such moves, and henceforth, I use the term 'sociotechnical' to rhetorically insist on such combinations at work within UCD.

STS analyses of the dynamics of technological development as social processes provide two important insights concerning technological development and the nature of technological artefacts. Both insights have profound implications for understanding design practice and understanding the material-semiotic resources and outcomes of design. In terms of design practice, STS taught me that technological objects emerge through the interplay of innovators, designers, institutions, stakeholders, users as well as technologies, discourse and practices. In other words, necessary to the doing of design is the doing of social and technical innovation, and the participation and association of heterogeneous actors: either human, in the form of urban planners, engine designers, inventors and industrial designers; or non-human, in the form of highway underpasses, diesel fuel, electricity, laboratory equipment or the properties of synthetic plastics. In short, design, as in science and engineering, where facts and machines are built, is a collective and constructive process. In this way the 'design' of an electric vehicle (Callon, Michel, 1986) necessarily includes the visions, competencies, efforts and co-operation of a host of parties with varying interests, including, but not limited to: an electricity supplier, a car manufacturer, a government ministry writing favourable legislation, an engine and transmission producer, batteries, electrons to produce electrical current and end-users mobilised through the issue of pollution.

The second insight is that technical objects themselves are networks composed of interoperating elements. When technological objects work, as assemblies, they operate as a single unit: a 'black box' (Callon, Michel, 1986, p. 29; Latour, Bruno, 1988b, p. 2), the contents of which remain unproblematic and out of sight. When artefacts break down, however, black boxes are opened and their inner workings are exposed and scrutinised. Furthermore, this approach to objects is also extended as a post-humanist and relational view of people. Like technological objects, people are also viewed as combinations of the human and the technological that combine in practice and in particular settings, something scholars interested in design have started to address (Berg, Marc, 1998; Danholt, Peter, 2005).

In sum, I am persuaded that these insights are crucial for understanding UCD. They insist that we pay attention to design practice, the objects of design practice, *and* users, as relational and heterogeneous. Moreover, insights from STS also point outside 'design practice' narrowly conceived, and its place within contemporary institutional, economic and policy settings. This stands in stark contrast to design literature which has been primarily preoccupied with historical meta-narratives and conditions such as 'modernism' (Mumford, Eric Paul, 2000; Pevsner, Nikolaus, 1960) and 'post-modernism' (e.g. Thackara, John, 1988) and their inter-relations (Whiteley, Nigel, 2002, pp. 246-307), the history, criticism and evaluation of cultural objects (Fuller, Peter, 1988; Woodham, Jonathan M., 1997), the meaning and function of the built

or designed artefact (Heskett, John, 1980), biographies of gifted individual designers (e.g. Frampton, Kenneth, 1980; Sparke, Penny, 2010), the social and cultural contexts and impacts of industrially produced artefacts (e.g. Forty, Adrian, 1986; Papanek, Victor, 2006; Pevsner, Nikolaus, 1960; Whiteley, Nigel, 1993) or the theories and discourse of designers (e.g. Banham, Reyner, 1962; Margolin, Victor, 1989) in how they conceive and frame the meaning of design and the designed artefact. There are, of course, exceptions and design scholarship has tentatively reached out to STS: for example the Design Issues symposium (Woodhouse, Edward & Patton, Jason W., 2004), following a project at the Rensselaer Polytechnic Institute to develop 'An STS Focus on Design'; and the 2008 annual International conference of the Design History Society, entitled 'Networks of Design' (Glynne, J, Hackney, F, & Minton, V), which addressed ANT in particular.

Despite the strengths of sociological and historical accounts of technology, as a trained and experienced interaction designer two weaknesses troubled me. Firstly, STS's detailed examinations of technological development tended to underplay the role of design, reducing it to an adjunct of engineering. For instance, in the design of electric vehicles, the introduction of CAD software into the visual culture of engineers (Henderson, Kathryn, 1991), or the design of ICTs (Akrich, Madeleine, 1992a) STS had very little to say about the role and import of design as a discrete discipline with a legacy in the arts and crafts. Only recently has STS, and indeed sociology more broadly speaking, demonstrated a sustained interest in the role and practice of design in, for example, accounts of economic activity associated with product development (Callon, Michel, et al., 2002), architectural design (Yaneva, Albena, 2009) and product design (Molotch, Harvey, 2003; Shove, Elizabeth, et al., 2007; Verbeek, Peter-Paul, 2005). Noteworthy, here, is how Callon connects up STS, economic sociology and design as glossed above. The second weakness concerns design as an anticipatory mode of practice where efforts and activities are oriented towards future social change and times to come; that is to say, in providing histories of the present, STS, until recently, neglected the future as an empirical and conceptual possibility. In the following section I outline the relevance of growing interest in the social sciences with anticipation and expectations in the form of discourse and practices associated with prediction, risk and optimisation and how this relates to design practice, in particular UCD.

Expectations and Anticipation

As literature in the sociology of expectations shows, innovation and invention in science and technology are tightly bound up with and profoundly structured by efforts to know and manage the future, with times to come. On this score, scholars have started to address the temporal aspects of contemporary life, whether it be the hopes and expectations associated with novel scientific developments such as biotechnology and genetic engineering (e.g. Brown, Nik, 1998, 2003; Brown, Nik & Kraft, Alison, 2006; Brown, Nik & Michael, Mike, 2003), the institutional deployment of formal future forecasting techniques such as Foresight and Delphi (Brown, Nik, Rappert, Brian, & Webster, Andrew; De Laat, Bastiaan, 2000), the speculation and development of commodities for future use (Deuten, Jasper, J. & Rip, Arie, 2000), the financial commoditisation of the future (e.g. Beunza, Daniel & Stark, David, 2004; MacKenzie, Donald A., 2006, p. 13), or the identification and indemnification of risks and uncertainties associated with modern industrial society (Beck, Ulrich, 1992). Accordingly, the future and temporality are 'told, traded, tamed and transformed' (Adam, Barbara, 2005, p. 1). This burgeoning field of interest not only addresses the prevalence of discourses of risk, reflexivity and uncertainty in western societies in general but the way in

which expectations work in the present to actively shape sociotechnical futures that in turn shape the grounds and possibilities of the present (see Michael, Mike, 2000a).

Such work has struck me as particularly salient in relation to the study of design – a practice manifestly concerned with proposing, inventing and disseminating novel sociotechnical artefacts, inducing new everyday practices. As for this thesis, expectations are also constructed and negotiated though the figure of the user as, for example, deployed in policy discourse (Wilkie, Alex & Michael, Mike, 2009). In this respect, UCD is a particularly interesting practico-theoretical enterprise through which futures are modelled, contested and managed around competing versions of the putative user (ibid., p. 5). Here, for example, path-dependencies rhetorically constructed around technologies, such as microchip development typified by Moore's law, intersect and jockey with the figuration of futures in human-centered design discourse. In this way the application of UCD will also be explored in relation to tensions enacted in discourse and practice between expectations shaped by technological and social dynamics. Furthermore, my attention to design practice and its production of anticipatory and speculative objects, such as visualisations, personas, prototypes and mock-ups will add a material dimension to literature on expectations which has primarily addressed futures performed in discourse, broadly framed. Thus, in this thesis I explore how the various models of users deployed in UCD practice operate in the construction and management of sociotechnical expectations. Here, I examine the valence of the user in relation to how practices of knowing the future (epistemology) and equipping the future (ontology) are entangled and synthesised in the practice of design.

Invention, Innovation and Creativity

Three interrelated notions – invention, innovation, and creativity – lie at the heart of the contemporary concerns about the dynamics of technological development and design. This is evidenced, not least, by sustained policy preoccupation with stimulating the connections between 'creativity', industry and research in order to promote economic development. In the UK, for example, The Department for Culture, Media and Sport envisions the UK as the 'world's creative hub' and works in partnership with public and private organisations, such as the UK Design Council and NESTA (the National Endowment for Science, Technology and the Arts) to advocate the importance of design in industry. Here, the practice of UCD, as applied in corporations such as Intel, is viewed as essential, as the authors of a Department of Trade and Industry Report insist: "We urge all UK technology companies to put PCD at the heart of their R&D and innovation activities and promote a people-centred culture throughout their organisations." (2004, p. 5). This reflects broader international policy preoccupations with the economic harnessing of creativity by, for example, the United Nations (2008, p. 357).

With such notions too, I find recent STS accounts of invention and innovation particularly insightful and useful. In STS accounts, the dynamics of technological development are empirically detailed as distributed across the efforts, competencies and affordances of both human and non-human actors. Thus, invention is a collective (human and non-human) effort that is contingent, path-dependent and irreversible (Barry, Andrew, 2005, p. 54). This, as Andrew Barry argues, has the following implications. First, invention includes the active participation of materials and substances. Thus, the conventional understanding of society is broadened to include how non-humans operate in the dynamics of innovation. Design, like the natural and applied sciences, invents new composites where prior innovations are combined with novelty. Invention is therefore also about association. In this way the notion of invention

recasts the notion of innovation from a linear process of development (Godin, Benoit, 2006) to a repetitive process of iterative transformations that work to open up new possibilities rather than close-down the trajectory of development (Barry, Andrew, 2005; Barry, Andrew & Thrift, Nigel, 2007). This understanding of inventive practice and the dynamics of technological change points to how change is not a 'natural' progressive and sequential procedure that is correspondingly allied with the accumulation of knowledge (Lépinay, Vincent Antonin, 2007, p. 530).

Such a view has radical implications, which have, in part, been programmatically addressed in scientific practice and technological development. As Bruno Latour (1988a) has forcefully argued, Pasteur neither discovered nor invented microbes. Rather, the interactions between Pasteur and all the resources and allies such as politicians, hygienists, laboratories, experiments, cattle and bacilli themselves worked to transform microbes from entities to qualified things with definite and stable attributes. Thus, to assign authorship to the figure 'Pasteur', or to credit the natural capacities of microbes, conceals all the complex interactions as well as the participation of numerous actors, both human and non-human. The implications of these arguments for design are plain to see, whether through the author function (Foucault, Michel, 1994/2000) that continues to operate with such figurative force in design discourse or accounts that attribute historical changes in aesthetic form to purely social change or outcomes credited to developments in technology and industry. Moreover, the recognition of non-human factors and distributed authorship in design provides a way to overcome debates concerning how to attribute agency in UCD. Inventive and creative agency, in this regard, is not attributed to nor concentrated in the individual designer, putative users or technology.

Doing Politics by Other Means

Last but not least, in this thesis I address how contemporary user-centered and participatory design practices re-connect with the doing of politics. The involvement and participation of users in the design of information and computer systems can be understood as a committed political undertaking in some approaches and as displaced or implicit within others. As I examine in detail in the literature review that follows, UCD's genealogy includes early efforts of instituting democratic workplace reform alongside the introduction of new industrial and organisational technology and work practices. Scandinavian 'Participatory Design', for example, included the fabrication and evaluation of material prototypes, which served to mediate negotiations between designers, users and stakeholders. Thus, the insight that the doing of politics is a pragmatic and material process involving non-humans is already ingrained into the imagination of participatory design and the nitty-gritty of its procedures. What counts here, however, is the application of different conceptions of people, mediated by users and formatted by the mode of politics being conducted. Bearing this in mind, UCD itself was originally advanced as a formal and experimental method for privileging intrinsic human qualities, such as goals and intentions, in the face of purportedly inhuman computer technologies. Latterly, these different approaches to user involvement converged, in part through the import of social theory, under the banner of UCD.

In the context of recent STS scholarship, in which politics is being thought anew in light of the recognition that non-humans – as material and semiotic actors – operate in the doing of politics, the practice of design, and UCD in particular, can be re-assessed as an enterprise through which dominant innovation actors, including multinational corporations, make eligible particular sociotechnical modes of being, at the expense of others. This attention to *being*, *agency* and the *material* is understood, following Annemarie

Mol (1999; 2003), as *ontological politics*. Here, the questions and problems shift from 'who' gets to be represented in deliberations over rightful outcomes, such as patients electing what counts as good care, employees contributing to the specification of their workplace technology, or for that matter consumer consultation in product development to critical questions addressing what new modes of sociotechnical life are brought into being and what unities and co-functioning of human-technology are eligible to participate in such futures.

Clearly, then, a study of UCD practice must confront how politics are locally and practically applied. In the above I have indicated how such politics link up with current concerns within the social sciences, for example contemporary concerns with economic life, developments in the politics of technology and the politics of anticipation (Adams, Vincanne, Murphy, Michelle, & Clarke, Adele E, 2009). Empirically, I address these issues through examining how multiple forms and modes of users are enacted in practice during the development of interactive consumer and medical technologies and during an industry conference in which differing accounts of users featured.

Thesis Structure

In the thesis, I develop the research questions and arguments introduced above through four substantive case studies drawn from my ethnographic fieldwork. In each case I consider different aspects of and intersections between user involvement, socio-material practices and expectation discourses. Each case study provides a different empirical object associated with and featuring user involvement, broadly framed. By way of preview, the case studies include: an ethnographic interview and related innovation meeting which were both part of designers' efforts towards inventing a new telemedicine technology; the role of a persona during the development of an information system for the kitchen; user involvement in the design of a prototype to encourage and manage fitness routines, and finally; an industry conference in which accounts of users mediate the doing of ethnographic user-studies in design. Prior to presenting the substantive material I examine the sociological context for this study and I provide and account for my theoretical and methodological approach.

In chapter two, I review how the user is variously conceived in both HCI and STS, given that both inflect and inform one another. Accordingly, this chapter is structured into two sections: a review of HCI and UCD literature tracing the various conceptions of the user in relation to the development of computer systems, and a more lengthy review of the various approaches to the user in STS literature. I summarise UCD as a practico-theoretical development within HCI where early 'cognitivist' models of the user have been challenged by 'sociological' and 'anthropological' approaches. Furthermore, I demonstrate how this move in the conception of the user coincided with a turn from workplace and organisational reform through the introduction of new technology to technological use in broader cultural settings. With regards to STS literature on the user I summarize five key approaches within the sociology and history of technology in which the role of the user is implicitly and explicitly examined in both the development and consumption of technology. The approaches include: (1) The Social Construction of Technology (SCOT) where the fate of artefacts is closely tied to the meanings attached to them by end-users; (2) the view that the capacities and identity of the putative user are semiotically inscribed into technologies during the design and development to be 'read', subsequently, by the end-user; and (3) studies inspired by and related to ANT in which the user is materially and semiotically entangled in and performed through heterogeneous networks of humans and non-humans during both the development and end-use of

technology; (4) the work of feminist scholars of technology who have brought attention to the underrepresentation and active involvement of women during the design, production and consumption of technology, most notably domestic technology, which points to other lacunae within user studies such as race; (5) the work of media and cultural theorists who have examined the way in which domestic users actively consume and culturally appropriate media and communication technologies and in doing so become linked up to ideological processes. In conclusion I expand on the conceptualisation of UCD as a mode of doing politics and as a form of socio-material experimentation, which serves to prepare the ground for the three key interconnected arguments that I pursue in this thesis.

In chapter three, I present my methodological framework for studying design practice and the enactment of users in the field. The chapter is structured in the following way. First, I introduce the organisational setting in which I conducted an ethnography of designers and users in order to ground my empirical work. Second, I discuss the key principles for conducting an ethnographic study of designers and the enactment of users within UCD processes. I identify correspondences between ethnographic accounts of users within STS (i.e. Akrich, Madeleine, 1992b; Woolgar, Steve, 1991) and draw out a set of key methodological assumptions for following designers' practice and studying the situated enactment of users encountered as multiple, heterogeneous and emergent. Finally, I present a detailed description of my fieldwork methods including participant observation, document analysis, photography and ethnographic interviews. Here, I discuss the methodological issues and challenges I faced in participating in and studying design practices and user involvement within the context of a multinational corporation.

In chapter four, the first empirical chapter, I examine the role of a non-user in mediating the expectations of the design team tasked with inventing and designing a novel mobile health technology to enhance the management of a chronic disease. I trace how user-involvement was enacted in the form of an in-home 'ethnographic' interview conducted with an elderly man suffering from diabetes amongst other health conditions. I examine how data derived from the interview was employed by the design team to evaluate product opportunities associated with interactive enhancement of diabetes. Two principle observations follow from this. First, that user involvement included obtaining a 'thick' account of a diabetic situated in his 'natural' setting, occasioned as local and messily heterogeneous. Second, through the visual and material ordering of data derived from the interview the design team disentangle and re-order workable aspects of sociotechnical practice elicited during the interview. Treating the interview data as a diabetic user-assemblage, I argue that the design team were able to put to use features of a non-user during their evaluation of diabetes and its technological enhancement as a commercial prospect.

In chapter five, I examine how the design team brought into being and employed a persona representing a middle-class housewife during the development of an interactive system for the kitchen. Here, the representational practices of the design team come to the fore in marshalling and combining pre-existing genderscripts (Oudshoorn, Nelly, 1996) as a means of including individual and collective users in their design activities. I demonstrate how this resources the specification, fabrication and demonstration of their vision of domestic computing to audiences whose continued support is crucial to the development of the technology. In contrast to conventional accounts of personas, wherein they are described as a-priori and discrete devices used to represent the requirements of a prospective user group, I argue that in practice the persona and the kitchen technology co-emerge. That is to say, both user and technology define one another through a process of iteration in which correspondences between the attributes of the persona and the features of the prototype are produced and managed.

In chapter six, I explore how multiple users resource the design and development of a prototype health and fitness technology. I approach the prototype as an assemblage of bodies, technologies and discourse that emerges out of collaborations between the design team and a research laboratory developing a novel mobile sensor. Heuristically, I organize the users involved in this project into two broad temporal categories. First, I define *distal-users* as figures that are explicitly articulated in the rational for the technology as representations of prospective users and user groups. Second, I define *proximal-users* as enactments of people (embodied and representational) mobilised in the present in order to discursively and materially format distal users situated in the future, including the designers themselves.

In chapter seven, I turn my analytic attention to the 'Ethnographic Praxis in Industry Conference' (EPIC) 2006. Here, I examine how the user served as a means for conducting ethnography-in-design as well as informing the conception and design of actual technologies, as discussed in previous empirical chapters. The central argument that I pursue in this chapter is how users *assemble* by way of various contradictory logics and tensions that exist at the intersections between ethnography and design. I address how empirical user-research in the design of ICT-related products and services is conducted under the auspices of 'ethnography' to meet the different demands of scholarly and commercial audiences and agendas. Accordingly, I analyse how users were discursively enacted as part of conference proceedings, including paper presentations and a workshop session. I identify and discuss three key interrelated tensions in conference participants' accounts of their work by which users emerge, including: (1) the interplay between realist reports of people and participants' reflection on the methods that are used to produce knowledge of users; (2) the relation between empirical analysis of users in their local cultural settings and the deployment of this knowledge to guide and manage future expectations more broadly; (3) the relation between, on the one hand, the study of particular socio-cultural-technical practices and, on the other hand, the use of abstract notions and concepts sensitising designers and organisations to sociotechnical life more broadly. To better grasp the multiple ways that ethnography and design relate I draw on the image of the *rhizome* (Deleuze, Gilles, 1993, p. 29; Deleuze, Gilles & Guattari, Félix, 1988, p. 6) and employ the notion of the *ethno-user assemblage*. I describe the various engagements between ethnography and design as rhizomatic entanglements of practice and knowledge out of which different models of the user emerge. I conclude this chapter by reflecting on the nature of the user and consider the relevance of this chapter to the thesis as a whole, before moving on to the thesis conclusion.

In the final chapter, I conclude by summarising the main points of my empirically derived arguments and consider the implications for STS, the practice of user-centered and participatory design. Here, I return to sociological matters raised in this chapter. I argue that the contemporary application of UCD necessarily includes users as socio-material assemblages that are synthesised in practice. As such, users make available relational prospects between everyday practice, varying conceptions of people, emerging technology and corporate strategy. Thus, I detail how *design regimes* work by virtue of the discursive and material enactment of users throughout the design process. In so doing I return to the question of the politics of user involvement. I use the notion of user-assemblage as an analytic device to heuristically characterise different modes of user involvement to consider the assembling of new capacities for action to the exclusion of others. Accordingly, each chapter serves to examine in detail the various enactments of users and socio-material micro-politics at play in UCD. This includes the design of prospective everyday sociotechnical practices that are materially anticipated and envisioned, the disciplinary and career interests of innovations actors, as well as the strategies of an incumbent microprocessor manufacturer where such micro-politics are translated into the encoding of billions of microprocessors.

References

Adam, Barbara (2005). *Futures Told, Tamed and Traded*. Retrieved 17th December 2010, from Cardiff University: http://www.cardiff.ac.uk/socsi/futures/ESRC%20PF%20Futures%20TTT.pdf

Adams, Vincanne, Murphy, Michelle, & Clarke, Adele E (2009). Anticipation: Technoscience, Life, Affect, Temporality. *Subjectivity*, 28(1), 246-265.

Akrich, Madeleine (1992a). Beyond Social Construction of Technology: The Shaping of People and Things in the Innovation Process. In Meinolf Dierkes & Ute Hoffman (Eds.), *New Technology at the Outset: Social Forces in the Shaping of Technological Innovations* (pp. 173-190). Frankfurt & New York: Campus Verlag.

Akrich, Madeleine (1992b). The De-Scription of Technical Objects. In Wiebe Bijker & John Law (Eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (pp. 205-224). Cambridge, Mass.: MIT.

Akrich, Madeleine (1995). User Representations: Practices, Methods and Sociology. In Arie Rip, Thomas J. Misa & Johan Schot (Eds.), *Managing Technology in Society: The Approach of Constructive Technology Assessment* (pp. 167-184). London and New York: Pinter Publishers.

Banham, Reyner (1962). *Theory and Design in the First Machine Age*. London: The architectural press.

Barry, Andrew (2001). *Political Machines: Governing a Technological Society.* Continuum International Publishing Group - Athlone Press.

Barry, Andrew (2005). Pharmaceutical Matters: The Invention of Informed Materials. *Theory, Culture & Society*, 22(1), 51-69.

Barry, Andrew, Born, Georgina, & Weszkalnys, Gisa (2008). Logics of Interdisciplinarity. *Economy and Society*, 37(1), 20-49.

Barry, Andrew, & Thrift, Nigel (2007). Gabriel Tarde: Imitation, Invention and Economy. *Economy and Society*, 36(4), 509-525.

Beck, Ulrich (1992). *Risk Society: Towards a New Modernity*. London: Sage.

Berg, Marc (1998). The Politics of Technology: On Bringing Social Theory into Technological Design. *Science, Technology, & Human Values*, 23(4), 456-490.

Beunza, Daniel, & Stark, David (2004). Tools of the Trade: The Socio-Technology of Arbitrage in a Wall Street Trading Room. *Industrial and Corporate Change*, 13(2), 369-400.

Bijker, Wiebe E. (1995/1999). *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge, Mass.: MIT.

Boltanksi, Luc, & Chiapello, Eve (2005). *The New Spirit of Capitalism*. London; New York: Verso.

Brown, Nik (1998). *Ordering Hope: Representations of Xenotransplantation – an Actor/Actant Network Theory Account*. Lancaster: Lancaster University.

Brown, Nik (2003). Hope against Hype: Accountability in Biopasts, Presents and Futures. *Science Studies*, 16(2), 3-21.

Brown, Nik, & Kraft, Alison (2006). Blood Ties: Banking the Stem Cell Promise. *Technology Analysis & Strategic Management*, 3(4), 313-327.

Brown, Nik, & Michael, Mike (2003). A Sociology of Expectations: Retrospecting Prospects and Prospecting Retrospects. *Technology Analysis & Strategic Management*, 15(1), 3-18.

Brown, Nik, Rappert, Brian, & Webster, Andrew *Foresight as a Tool for the Management of Knowledge Flows and Innovation* (Formakin): Science and Technology Studies Unit, The University of York, UK.

Callon, Michel (1986). *The Sociology of an Actor-Network: The Case of the Electric Vehicle Mapping the Dynamics of Science and Technology*. London: Macmillan.

Callon, Michel (2004). The Role of Hybrid Communities and Socio-Technical Arrangements in the Participatory Design. *Journal of the Center for Information Studies*, 5, 3-10.

Callon, Michel, & Law, John (1995). Agency and the Hybrid Collectif. *The South Atlantic Quarterly*, 94(2), 481-507.

Callon, Michel, Méadel, Cécile, & Rabeharisoa, Vololona (2002). The Economy of Qualities. *Economy and Society*, 31(2), 194-217.

Cefkin, Melissa (Ed.). (2009). *Ethnography and the Corporate Encounter*. New York, Oxford: Berghahn Books.

Danholt, Peter (2005). *How Is User-Centered Design Interested in Users? A Posthumanist Approach*. Paper presented at the IRIS - Reaching Out, Proceedings of the 28th Information Systems Research Seminar in Scandinavia (IRIS), Kristiansand, Norway.

De Laat, Bastiaan (2000). Scripts for the Future: Using Innovation Studies to Design Foresight Tools. In Nik Brown, Brian Rappert & Andrew Webster (Eds.), *Contested Futures: A Sociology of Prospective Techno-Science* (pp. 175-208). Aldershot: Ashgate.

Deleuze, Gilles (1993). Rhizome Versus Trees. In Constantin V. Boundas (Ed.), *The Deleuze Reader*. New York, NY: Columbia University Press.

Deleuze, Gilles, & Guattari, Félix (1988). *A Thousand Plateaus: Capitalism and Schizophrenia*. London: Athlone.

Deuten, Jasper, J., & Rip, Arie (2000). The Narrative Shaping of a Product Development Process. In Nik Brown, Brian Rappert & Andrew Webster (Eds.), *Contested Futures: A Sociology of Prospective Techno-Science* (pp. 65-86). Aldershot: Ashgate.

Dilnot, Clive (1984a). The State of Design History, Part I: Mapping the Field. *Design Issues*, 1(1), 4-23.

Dilnot, Clive (1984b). The State of Design History, Part Ii: Problems and Possibilities. *Design Issues*, 1(2), 3-20.

Dunne, Anthony (1999). *Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design*. London: RCA Computer Related Design Research.

Forty, Adrian (1986). *Objects of Desire: Design and Society, 1750-1980*. London: Thames and Hudson.

Foucault, Michel (1975/1991). *Discipline and Punish: The Birth of the Prison* (Alan Sheridan, Trans.). London: Penguin.

Foucault, Michel (2000). What Is an Author? In James D. Faubion (Ed.), *Michel Foucault: Aesthetics, Method, and Epistemology* (Vol. 2, pp. 205-224). London: Penguin Books.

Frampton, Kenneth (1980). *Modern Architecture: A Critical History*. London: Thames and Hudson.

Fuller, Peter (1988). The Search for a Postmodern Aesthetic. In John Thackara (Ed.), Design after Modernism: Beyond the Object (pp. 117-134). London: Thames and Hudson.

Garrety, Karin, & Badham, Richard (2004). User-Centered Design and the Normative Politics of Technology. *Science Technology Human Values*, 29(2), 191-212.

Glynne, J, Hackney, F, & Minton, V (2008). *Networks of Design*: Proceedings of the 2008 Annual International Conference of the Design History Society (Uk) University College Falmouth, 3-6 September.

Godin, Benoit (2006). The Linear Model of Innovation: The Historical Construction of an Analytical Framework. *Science Technology Human Values*, 31(6), 639-667.

Halewood, M (2008). Introduction to Special Section on an Whitehead. *Theory, Culture & Society*, 25(4), 1.

Haraway, Donna (1991). *Simians, Cyborgs, and Women: The Reinvention of Nature*. London: Free Association Books.

Henderson, Kathryn (1991). Flexible Sketches and Inflexible Data Bases: Visual Communication, Conscription Devices, and Boundary Objects in Design Engineering. *Science, Technology, & Human Values*, 16(No. 4), 448-473.

Heskett, John (1980). *Industrial Design*. London: Thames & Hudson.

Hutchins, Edwin (1996). *Cognition in the Wild.* London: The MIT Press.

Latour, Bruno (1988a). *The Pasteurization of France*. Cambridge, Mass.: Harvard University Press.

Latour, Bruno (1988b). *Science in Action.* Cambridge, Mass.: Harvard University Press.

Latour, Bruno (1991). Technology Is Society Made Durable. In John Law (Ed.), *Sociology of Monsters: Essays on Power, Technology and Domination* (pp. 273). London: Routledge.

Latour, Bruno (1993). *We Have Never Been Modern*. Hemel Hempstead: Harvester Wheatsheaf.

Law, John (1994). *Organizing Modernity*. Oxford: Blackwell.

Lépinay, Vincent Antonin (2007). Economy of the Germ: Captial, Accumulation and Vibration. *Economy and Society,* 36(4), 526-548.

Lury, Celia (2004). *Brands: The Logos of the Global Economy*. London: Routledge.

MacKenzie, Donald A. (2006). *An Engine, Not a Camera: How Financial Models Shape Markets*. Cambridge, Mass. ; London: MIT.

Margolin, Victor (1997). Getting to Know the User. *Design Studies*, 18(3), 227-236.

Margolin, Victor (Ed.). (1989). *Design Discourse: History, Theory, Criticism*. Chicago; London: The University of Chicago Press.

Marres, Noortje (2009). Testing Powers of Engagement: Green Living Experiments, the Ontological Turn and the Undoability of Involvement. *European Journal of Social Theory*, 12(1), 117-133.

Michael, Mike (2000a). Futures of the Present: From Performativity to Prehension. In Nik Brown, Brian Rappert & Andrew Webster (Eds.), *Contested Futures: A Sociology of Prospective Techno-Science* (pp. 21-39). Aldershot: Ashgate.

Michael, Mike (2000b). *Reconnecting Culture, Technology and Nature: From Society to Heterogeneity*. London: Routledge.

Mol, Annamarie (1999). Ontological Politics. A Word and Some Questions. In John Law & John Hassard (Eds.), *Actor Network Theory and After* (pp. 74-89). Oxford; Malden, Massachusetts: Blackwell Publishers/The Sociological Review.

Mol, Annemarie (2003). *The Body Multiple: Ontology in Medical Practice*. Durham, N.C.; London: Duke University Press.

Molotch, Harvey (2003). *Where Stuff Comes From: How Toasters, Toilets, Cars, Computers, and Many Others Things Come to Be as They Are*. New York ; London: Routledge.

Mumford, Eric Paul (2000). *The Ciam Discourse on Urbanism, 1928-1960*. Cambridge, Mass. ; London: MIT Press.

Norman, Donald A. (1988). *The Design of Everyday Things*. London: MIT.

Oudshoorn. Nelly. (1996) *Genderscripts in technologie. Noodlot of uitdaging*, Inaugural speech University of Twente.

Papanek, Victor (2006). *Design for the Real World: Human Ecology and Social Change*. London: Thames and Hudson.

Pevsner, Nikolaus (1960). *Pioneers of Modern Design: From William Morris to Walter Gropius.* London: Penguin Books.

Pine, B. Joseph, & Gilmore, James H. (1999). *The Experience Economy : Work Is Theatre & Every Business a Stage*. Boston: Harvard Business School Press.

Rogers, Richard (2000). *Preferred Placement : Knowledge Politics on the Web*. Maastricht: Jan Van Eyck Akademie.

Rommes, Els, van Oost, Ellen, & Oudshoorn, Nelly (1999). Gender and the Design of a Digital City. *Information Technology, Communication and Society*, 2(4), 476-495.

Shove, Elizabeth, Watson, Matthew, Hand, Martin, & Ingram, Jack (2007). *The Design of Everyday Life*. Oxford: Berg.

Sparke, Penny (2010). *The Genius of Design*. London: Quadrille Publishing Ltd.

Thackara, John (1988). *Design after Modernism: Beyond the Object*. London: Thames and Hudson.

The Department of Trade and Industry (2004). *Innovation through People-Centred Design - Lessons from the USA*. Report of a Dti Global Watch Mission. London: Pera Innovation Limited on behalf of the Department of Trade and Industry.

Thrift, Nigel (2005). *Knowing Capitalism*. London: SAGE Publications.

Thrift, Nigel (2008). *Non-Representational Theory: Space, Politics, Affect*. London: Routledge.

United Nations (2008). *Creative Economy Report 2008: The Challenge of Assessing the Creative Economy Towards Informed Policy-Making*: United Nations, United Nations Development Programme & United Nations Conference on Trade and Development.

van Oost, Ellen (2003). Materialized Gender: How Shavers Configure Users' Femininity and Masculinity. In Nelly Oudshoorn & T. J. Pinch (Eds.), *How Users Matter : The Co-Construction of Users and Technologies* (pp. 67-80). Cambridge, Mass. ; London: MIT.

Verbeek, Peter-Paul (2005). *What Things Do : Philosophical Reflections on Technology, Agency, and Design*. University Park, Pa.: Pennsylvania State University Press ; [London : Eurospan distributor].

Whiteley, Nigel (1993). *Design for Society*. London: Reaktion.

Whiteley, Nigel (2002). *Reyner Banham: Historian of the Immediate Future*. Cambridge, Mass: MIT Press.

Wilkie, Alex, & Michael, Mike (2009). Expectation and Mobilisation: Enacting Future Users. *Science Technology Human Values*, 34(4), 502-522.

Winner, Langdon (1986). *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. Chicago; London: University of Chicago Press.

Woodham, Jonathan M. (1997). *Twentieth Century Design*. Oxford: Oxford University Press.

Woodhouse, Edward, & Patton, Jason W. (2004). Design by Society: Science and Technology Studies and the Social Shaping of Design. Design Issues, 20(3), 1-12.

Woolgar, Steve (1991). Configuring the User: The Case of Usability Trials. In John Law (Ed.), *Sociology of Monsters: Essays on Power, Technology and Domination* (pp. 57-99). London: Routledge.

Yaneva, Albena (2009). *The Making of a Building: A Pragmatist Approach to Architecture*. Oxford: Peter Lang AG.

Formato de citación

Wilkie, Alex (2011). Regimes of Design, Logics of Users. *Athenea Digital*, *11*(1), 317-334. Disponible en http://psicologiasocial.uab.es/athenea/index.php/atheneaDigital/article/view/842