The Sociality of Domestic Environments

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**Table of Contents**

Shaping the Home:  
Architecture, Technology, and Social Interaction  
Introduction (pp. 4-5)

ARCHITECTURE AND THE HOME (pp. 5-27)  
Learning from the use of buildings (pp. 13-17)  
From principle to practice: developing a pattern language (pp. 17-27)

TECHNOLOGY AND THE HOME (pp. 28-43)  
A post-revolutionary perspective on the home (pp. 29-38)  
Supporting innovation: developing the future through studying the present (pp. 38-43)

SOCIAL INTERACTION (pp. 43-65)  
Studying members’ meanings (pp. 44-53)  
Consulting members’ formulations of meaning (pp. 53-65)
Abstract. Deliverable 1.1 The Historical Shaping of the Home identified architecture, technology, and social interaction as constituent features of domestic legacy that are relevant to the design of computer-based technologies for the home. This chapter explores each of these topical constituents in turn, with an eye towards formulating one potential strategy whereby the three points of view may be combined in a constructive way for purposes of design. In particular, that strategy develops the notion of a pattern language for purposes of design. The pattern language framework places emphasis on the recurrent relationships that observably obtain between action and technology within specific environments such as the home. Thus, the framework seeks to ground design in an empirically available domestic legacy that consists of architecturally situated patterns of technology usage.

Introduction

Deliverable 1.1 The Historical Shaping of the Home identified architecture, technology, and social interaction as constituent features of domestic legacy, which are important to the design and uptake of novel technologies for the home.¹ The task in this deliverable is one of explicating various orders of practical and theoretical reasoning “at work” in contemporary architecture, the design of technology for the home, and the study of social interaction. The purposes of this task is one of developing a combinatory strategy towards the design of novel technologies that take account of and are predicated upon (or “informed” by) domestic legacy. We first review the domain of architecture, placing particular emphasis upon use evaluation and the notion of a pattern language developed by Christopher Alexander. We explicate the pattern language framework and identify particular methodological problems concerned with the observation of patterns. We then review the domain of

technology design within the context of the home where Alexander’s pattern language has been proposed as a useful vehicle for design, grounding design in patterns of technology usage in the home. Here we place particular emphasis on Alladi Venkatesh’s influential household-technology model, which seeks to identify actual patterns of technology usage. In considering Venkatesh’s work, we again identify particular methodological problems concerned with the identification of patterns.

While there is much to commend in Venkatesh’s work, a concern with the sociological functions of technology in the home glosses over actual patterns of technology usage. A more appropriate sociological method of observation is required to identify patterns and we turn then to a consideration of social interaction and the study of meaning, which drives technology usage. We explore in particular the ethnomethodological approach to the study of meaning, placing emphasis upon the “work” members accomplish through their situated formulations of meaning and the local work-practices whereby those activities are socially organized as routine day-to-day accomplishments. Members’ daily household routines consist of, and their study makes available to design, actual patterns of technology usage that obtain in the home. Thus, through a consideration of practical and theoretical orders of reasoning in architecture, technology design, and the study of social interaction, we elaborate a distinct methodological approach to the investigation of domestic legacy, and the identification of historically and architecturally situated patterns of technology usage in particular, that is rooted in the lived reality of domestic life.

ARCHITECTURE AND THE HOME

The contemporary domestic landscape is characterized by a wide variety of housing forms, ranging from through-terraces and back-to-backs, to converted agricultural and industrial buildings, to modern and post-modern urban and suburban developments, etc. Underpinning this environmental legacy is a slow but steady and ongoing process of evolution, which has seen the internal segregations of domestic space laid out by Victorian architects and builders collapse over recent years and be replaced by multifunctional internal configurations. Multifunctionality was initially championed by the “modernist” movement in architecture (and further developed by the Bauhaus school), although the movement’s ideas were not well received by the public as the social history of the high-rise flat and the reconfiguration of open-plan new town
developments stand testimony to. Indeed, public resistance was taken by design theorists and architects alike to signal the “failure of modernism”.2

Within the confines of the home the mark of modernism is characterized by the open-plan living space. Inspired by post-war optimism and the opportunity of widespread reconstruction, modernism was propelled by utopian ideals that sought to level the social hierarchies of gender and power that were seen to be embodied in the traditional home. For the modernists, the segregations of domestic space reflected segregations in the wider social environment - a hierarchy of rooms separating service staff from employers, males from females, for example. Open-plan was seen as synonymous with freedom and democracy. It was not seen as such by those who came to occupy the modern home however, who saw the openness of the modern plan as something to manage and control. Although prohibited by the many local authorities who owned the vast majority of modern homes, do-it-yourself structural changes were widespread. Walls separating living and eating areas were constructed, kitchens designed only for cooking were made into dining areas, cupboards and shelves were erected ad libitum – much to the resentment of architects. Nonetheless, residents continued to fashion the modern home in response to their practical day-to-day needs and formal systems of managing structural changes were rapidly implemented by a great many local authorities. The multifunctionality that constitutes contemporary domestic form is not so much a product of architectural innovation then, but of the appropriation and adaptation of the domestic space by its residents.3

The contemporary multifunctional home – whether it be a modernist home or an older dwelling – has largely been crafted by the daily needs of its inhabitants then, not by architects. It is the product of an ongoing process of evolution whereby inhabitants appropriate domestic space, old and new, and adapt it to their uses and requirements. The architectural historian Stuart Brand (1994) suggests that developing an appreciation of the evolutionary character of the home is central to understanding what the construction of “livable” domestic environments rely upon.4

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Between the dazzle of a new building and its eventual corpse … [is the] unappreciated, undocumented, awkward-seeming time when it was alive to evolution … those are the best years, the time when the building can engage us at our own level of complexity. How do those years work, actually?

For Brand, time provides the critical analytic focus for unearthing the factors at work in the evolution of the domestic environment. Over the course of its progression, time reveals that new usages emerge and come to reshape buildings. The old factory becomes redundant, its workers are laid off, nothing is left but a derelict shell. Then the economy prospers, speculative builders buy and renovate the factory, turning it into desirable waterfront apartments. The ground floor houses small arts and craft boutiques, restaurants, and other amenities. Elsewhere newer, more contemporary environments begin to emerge and the inhabitants of the apartments move on and up the social scale. The boutiques, restaurants, and bars relocate, following the market and over time the factory apartments are neglected and fall into disrepair. Eventually, the building is purchased by the local authorities and the factory is demolished to make space for new developments. This, from first drawing to final demolition, buildings are shaped and reshaped over time by changing social trends and uses.

Underpinning evolutionary trends and uses are number of discrete “building components”.5 Brand describes these components as the generic “six S’s”.

SITE – This is the geographical setting, … location, and the legally defined lot, whose boundaries and context outlast generations of ephemeral buildings.

STRUCTURE – The foundation and load-bearing elements are perilous and expensive to change, so people don’t. These are the building. Structural life ranges from 30 to 300 years (but few buildings make it past 60, for other reasons).

SKIN – Exterior surfaces now change every 20 years or so, to keep up with fashion or technology, or for wholesale repair. Recent focus on energy costs has led to reengineered skins that are airtight and better-insulated.

SERVICES – These are the working guts of a building: communications wiring, electrical wiring, plumbing, sprinkler systems, HVAC (heating, ventilating, and air conditioning), and moving parts like elevators and escalators. Many buildings are demolished early if their outdated systems are too deeply embedded to replace easily.

SPACE PLAN – The interior layout – where walls, ceilings, floors, and doors go. Turbulent commercial space can change every 3 years or so; exceptionally quiet homes might wait 30 years.

STUFF – Chairs, desks, phones, pictures; kitchen appliances, lamps, hair brushes; all the things that twitch around daily to monthly. Furniture is called mobilia in Italian for good reason.

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Each of these different components or “layers” of a building is subject to different rates of change, and in temporal order increase in speed from the outside in. Insofar as buildings are lived in and used, they are in various ways subject to continuous change, whether it be to the site through landscape gardening, for example, or to the structure in extending the kitchen, or altering the skin in putting a skylight in, or adapting the services in putting anew heating system in, or altering the space plan in opening up a segregating wall, or simply moving the stuff of the home around. Whatever the case, and no matter how radical or subtle, buildings are in a constant state of change, nothing is static, they are forever evolving as new social trends and uses emerge.

One significant current social trend is seeing the computer being increasingly appropriated and adapted for domestic uses. The computer is clearly relevant to two layers of domestic evolution: services and mobilia. It is, perhaps, in respect to the technological nature of future services in particular, and mobilia to some extent (at least in the sense of providing insights into the necessary infrastructure supporting the deployment of electronic mobilia), that we might expect architecture to have some contribution to make to the ongoing evolution of the home. Although architects are currently considering the nature and role of computer-based technologies in the built environment (e.g. Mitchell 2000), an appreciation of the evolutionary process of change is largely absent from the architectural literature however, and with that absence goes the potential contribution of architecture to the design of domestic

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technologies. The absence of such insights, and with them, potential contributions to the ongoing development of the home environment through the incorporation and adaptation of the computer, is attributed by Brand to a particular disciplinary bias, which underpins contemporary architecture’s internally recognized “crisis”.

THE CRISIS OF CONTEMPORARY ARCHITECTURE
At the core of the current crisis in architecture is the art-craft dichotomy. The professionalization of architecture, which began in the mid-nineteenth century, stands on the foundational distinction between art and craft and serves to distinguish architects from “mere builders” as it were. Builders are craftsmen; architects artists. Understood as art, architecture is characterized as an inherently radical enterprise, flouting convention, challenging expectations, and redefining style. The problem with the dominant artistic perspective, and source of the current crisis, is that art, while visionary in character, is essentially non-functional and impractical – which means that architecturally designed buildings, while visually impressive, tend to be non-functional and impractical. It might otherwise be said that architecture has cultivated a professional ignorance of the social uses of buildings; that everyday practicalities and evolutionary insights are overlooked in the noble pursuit of art. Dissatisfied architects go further, arguing that architecture does not simply ignore use but actively eschews any such consideration.

Awards never reflect functionality. I remember serving on a jury one time and suggesting, “Okay, we’ve winnowed this down to ten projects that we really like. Let’s call the clients and see how they feel about the buildings, because I don’t want to give an award to a building that doesn’t work.” I was hooted down by my fellow architects. (Herb McLaughlin cited in Brand)

The artistic perspective does not appeal to functionality or use to evaluate buildings, but is instead concerned with aesthetic qualities, particularly the visual. At the heart of evaluation is architectural photography and (purportedly) transcendental criteria of visual style. As Frank Duffy, President of the Royal Institute of British Architects (1993-95), puts it,

Architectural photography … is all about the wonderfully composed shot, the absolutely lifeless picture that takes time out of architecture – the photograph taken the day before the move-in. That’s what you get awards for, that’s what you make a career based on. All those lovely but

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empty stills of uninhabited and uninhabitable spaces have squeezed more life out of architecture than perhaps any other single factor. (ibid. emphasis added)

The timelessness of aesthetic qualities is assumed and underpins evaluation. Time is ignored then, and with it the evolution of buildings through their daily uses. The consequences of this ignorance are, first, that contemporary architecture has found itself (according to Duffy) “stuck in the skin trade”, and second, as such, become a marginal part of the overall construction process. Today a mere five per cent of all new buildings have an input from architects.

As a result of long-term engagement with artistic aspirations, architecture has today become a marginalized and relatively powerless profession in the construction industry, shaping little more than the impractically stylised and, in real time, ephemeral skins of buildings. When architects do get the chance to flex their muscles, the results are often less than inspiring from a functional point of view. As Brand describes matters,

In the 1980s, malpractice lawsuits against architects surpassed those against doctors. Architects are learning painfully in court what they did not learn in school or from their buildings about leaky roofs, feeble structure, shoddy materials, poor detailing, inept window design. The same harsh lessons are driven in by the providers of their expensive “errors and omissions” insurance.

For Brand, the hard lessons that architecture has been compelled to learn over recent years are the direct consequence of artistic aspiration, which not only ignores functionality but eschews anything more than a passing concern with it. Drawing on the writings of Judith Donahue (1989), Brand cites the work of Frank Lloyd Wright, widely recognized as the greatest American architect to date, as a paradigm case of the contemptible attitude adopted by the architectural profession to functionality, saying that Wright’s stock response to clients who complained of leaking roofs, for example, was “That’s how you can tell it’s a roof”.8 As a leading figure of architecture, Wright, like so many others, not only disregarded the concern with functionality but was scornful of it, preferring instead to place a professional emphasis on what, for all practical purposes, amounts to a concern with form over function. For example, Wright’s masterpiece, “Fallingwater” in Pennsylvania, a visually spectacular achievement, is plagued by leaks, damaging windows and walls

and undermining the structural integrity of the building. As Brand puts it, like so many other architectural masterpieces, Fallingwater “is indeed a gorgeous and influential house, but unlivable.” To be livable, buildings must be useable, and adaptable so that they continue to be useable, and that means that they must have functional integrity. The problem, at least for those who seek to reform the architectural enterprise, is one of how functional integrity is to be factored into the architectural process of design?

Two distinct processes of work characterize modern building programmes: one, a Japanese-style model, and two, an American-style model. The Japanese model is underpinned by a “design-build” approach that combines and coordinates all the services necessary to construction. Financing, site selection, building design (including architectural input), construction, interior design, furnishings, facilities, management, and maintenance are offered in a comprehensive package and the approach is, as Brand puts it, “murdering American and European competition”. The American model is underpinned by a “development” approach that is much more eclectic and entrepreneurial in style. Developers are parties who have money (that is the only necessary qualification) and manage construction, which proceeds through a contractual system of “bids” and time-clause “penalties”. The architect’s role in this melee is even less significant than in the Japanese model, becoming but a minor ornament of the culture, lucky if they get the chance to choose even the skin of the building.9 Brand suggests that insofar as architects do play a part in the either type of process, then their input tends to be dominated by two “instants” or “moments” in time: one, the “go ahead” moment, and two, the “hand over” moment. The go ahead moment relies on the presentation of a model and other renderings of the building to the client, who accepts (or rejects) the vision. The go ahead moment furnishes a tangible vision of the future, which the construction process sets out to realize. Having realized the vision in whatever ways, the hand over moment arrives where the responsibility for the building shifts from the architect(s) to the owner. The hand over moment is dominated by the “punch list”, which defines all the details that need to be finished before the job is done; a querulous, ill-tempered moment, which Brand tells us is often dominated by lawyers.

Just occasionally, the possibility of a third moment exists - post-occupancy or use evaluation. Post-occupancy evaluations are formal surveys of the occupants’ experiences of the building. Observers document how the building is used, comparing intended uses with actual uses. A wide range of users are considered in conducting such evaluations, not only including the users of particular “rooms” (offices, shops, restaurants, public spaces, facilities, etc.) but also those users who maintain the building: cleaners, service staff, security, building management, etc. Thus, the focus of evaluation is, in a sense, the working division of labour productive of the building’s use. Post-occupancy evaluations originated in the mid-sixties with a study of high-rise student dormitories at the University of California, Berkeley.10 As Brand describes it,

The study showed that large, showy lounges and recreation rooms were seldom used, that students were frantic for quiet and privacy to study in, that student rooms and desks were way too small, and that the rooms could not even be decorated by their reluctant occupants. Students were fleeing the dorms for any kind of private apartment or shared house in Berkeley. The design of dormitories improved as a result of the study.

Despite the clear usefulness of post-occupancy evaluations, such studies have not been taken up and championed by the architectural profession, within which they are considered to provide “negative feedback” by many.11 That is not to say that such studies are of little interest to certain sectors within the contemporary construction industry however. On the contrary, large client organizations such as hotel groups, fast food companies, global industries, and other large organizations who tend to develop similar types of building on a regular basis, have found a great deal of utility in post-occupancy evaluations, which they use to help refine and develop the functional integrity of the end product. Nonetheless, post-occupancy evaluation remains largely ignored in the field of architecture, where the design of unique “one-off” buildings is common and evaluation is constrained by contemporary construction processes. Nonetheless, and as the architect Ralph Tubbs pointed out, “analysis of requirements is the basis of all planning”.12 One of the primary challenges for contemporary architecture, if the profession is not to become an “irrelevance” as Brand puts it, consists of developing requirements that factor in the users of buildings

or perhaps more importantly, their uses of buildings, into the design and construction of livable spaces.

**Learning from the use of buildings**

The architect Christopher Alexander is at the forefront of efforts to rehabilitate the profession, placing an emphasis on exploring in practical detail what it is that makes buildings (and towns) livable.\(^\text{13}\) Like Duffy, Alexander is not concerned with the building as a timeless aesthetic entity but with its adaptability and adaptation over time. Alexander recognizes, and takes it as a fundamental phenomenon for architecture, that buildings and towns evolve over the course of their use. What is of interest to Alexander, then, is the fundamental character of use – what transcendental qualities does use consist of, how is use organized or structured, and how may architecture learn, quite literally, to build on evolved structures of use?

Those of us who are concerned with buildings tend to forget too easily that all the life and soul of a place, all our experiences there, depend not simply on the physical environment, but on the patterns of events which we experience there. (emphasis added)

At the core of Alexander’s work stands the notion of “patterns”. He observes that the world is a structured place, it consists of regularities, routine happenings, things that occur over and over again: patterns of events, and not only in nature. –

the same is true in any person’s individual life. If I consider my life honestly, I see that it is governed by a certain very small number of patterns of events which I take part in over and over again. Being in bed, having a shower, having breakfast in the kitchen, sitting in my study writing, walking in the garden, cooking and eating our common lunch at my office with my friends, going to the movies, taking my family to eat at a restaurant, having a drink at a friend’s house, driving on the freeway, going to bed again. There are a few more.

Alexander reasons that, like the world of non-human events, the world of human events is organized or structured in terms of patterns. As the sun rises each morning, people get up, shower, eat breakfast, and drive down the freeway to work, for example, where they together engage in other patterns of events, such as checking their mail, attending meetings, or going for lunch. Thus, while structuring our individual lives, patterns of events are essentially cultural or social in character: entire collectivities of peoples’ lives are organized through patterns of events, they bind

people together, giving distinct form to their lives, and even distinguish them from the members of other cultures (national or local). -

[Not only are] our individual lives are made from [patterns of events] … so are our lives together … they are the rules through which our culture maintains itself, keeps itself alive, and it is by building our lives out of these patterns of events, that we are people of our culture. (emphasis added)

Not only do patterns of events shape our lives, importantly for the architect, they are tied to particular spaces and constitutive of them: of buildings, business precincts, plazas, roads, towns, of concrete, material places. -

these patterns of events which repeat themselves are always anchored in space. I cannot imagine any pattern without imagining a place where it is happening.

And within any particular place the patterns of events from which it is composed in time are finite. –

what is most remarkable of all, the number of the patterns out of which a building or a town is made is rather small.

These observations, which are intuitively available to common sense reasoning, serve to identify the general character of the use factors that Alexander takes to be of relevance to architecture’s development, and to specify contemporary architecture’s foundational problematic. –

We know … that any town and any building gets its character from those events and patterns of events which keep on happening there the most; and that the patterns of events are linked, somehow, to space. (emphasis added)

How are constitutive patterns of events linked to material places? Just what is it that Alexander is suggesting should be taken into account by architects in the effort to reform the profession in considering the uses of buildings?

It is certainly not enough merely to say glibly that every pattern of events resides in space. That is obvious, and not very interesting. What we want to know is just how the [material] structure of space supports the patterns of events it does, in such a way that if we change the structure of the space, we shall be able to predict what kinds of changes in the patterns of events this change will generate. In short, we want a theory which presents the interaction of the space and the events, in a clear and unambiguous way.
The *prima facie* relevance of a theory of patterns is to support the design of livable material structures (apartment buildings, say) that are tailored to the patterns of events that go on in examples of such structures that are “more full of life than others”.

We know now, that every building and every town is made of patterns which repeat themselves throughout its fabric, and that it gets its character from just those patterns of which it is made. Yet it is obvious, intuitively, that some towns and buildings are more full of life: and others less. If they all get their character from the patterns they are made of, then somehow the greater the sense of life which fills one place, and which is missing from another, must be created by these patterns too.

Thus, the theory of patterns seeks to explicate material structures made up of patterns of events that have a positive life-giving character (livable environments, in contrast to unlivable ones, architecturally and socially construed), and to use the structures in which positive patterns occur as templates for (re)designing similar structures and patterns of events. In order to do that, the link between material structures and the patterns of events that take place within them needs to be articulated.

Alexander suggests that the link between particular material structures and constitutive life-giving patterns of events resides in the “relationships” that exist between the material elements that compose the structure and the specific patterns of events which tie those elements together as parts of a coherent whole.

For instance, the pattern of the freeway contains a certain fabric of events, defined by rules: drivers drive at certain speeds; there are rules governing the way that people may change lanes; the cars all face the same way; there are certain kinds of overtaking; people drive a little slower on the entrances and exists … The patterns of relationships we call a “freeway” is just that pattern of relationships required by the *process* of driving fast with limited access to and from the side roads: in short the pattern of events. (emphasis added)

What links material structures and patterns of events are the cultural or *social processes* whereby situated activities, such as driving on the freeway, are organized and conducted then. Material spaces are constituted in the ways in which people repeatedly do activities, such as driving, and thus utilise material places and their elements. At the same time, however, processes of situated action are reciprocally shaped by the elements that compose material spaces, making certain processes of action (certain fabrics of events, certain speeds, certain kinds of overtaking, etc.) possible. Place and action are *mutually constitutive* then, and Alexander’s task is one of identifying those material structures that make possible “fuller”, more enriched, or enhanced processes of action.
Given the mutually constitutive character of place and action, however, one cannot identify livable material structures independently of the patterns of events that take place there. Indeed, analytic focus on material structures “dissolves”, to be replaced by a fabric of mutually constitutive relationships that obtain between patterns of events and places, which give the livable/unlivable structure to a building or a town.

A modern metropolitan region … is made of industrial areas, freeways, central business districts, supermarkets, parks, single-family houses, gardens, high-rise housing, streets, arteries, traffic lights, sidewalks. And each of these elements has a specific pattern of events associated with it.

The analytic focus of Alexander’s pattern theory is, then, the fabric of relationships productive of place (be it a town or building) - the patterns of events and material arrangements that combine to make a place, such as a metropolitan region in the grouping and use of buildings, driving down freeways, going shopping, obeying traffic signals, or walking down sidewalks, etc. Such a fabric of relationships markedly contrasts, for example, with those found in a rural setting, or village. Analytic attention is not restricted to the “larger” or primary patterns which define particular places but also, and importantly, to the “smaller” fine-grained or component patterns that the larger patterns are composed of. –

The freeway, as a whole, does not repeat. But the fact that there are cloverleafs which connect the freeway to roads at certain intervals – that does repeat. But once again, the cloverleaf does not repeat. Each cloverleaf is different. What does repeat is that each lane forms a continuously curving off ramp to the right … Yet once again, the “lane” does not repeat. What we call a lane is itself a relationship of still smaller so-called elements – the edges of roads, the surface, the lines … each pattern is itself apparently composed of smaller things which look like parts … when we look closely at them, we see that these apparent “parts” are patterns too (emphasis added)

So the primary patterns of relationships that obtain between the actions and material arrangements which make up place are themselves made up of a host of component patterns of relationships, which lock together to form the whole.

It is this bundle of relationships which is essential, because these are the ones which are directly congruent with the patterns of events (emphasis added)

Primary patterns of relationships are made up of component patterns, and it is important to pay analytic attention to the components as they furnish the definitive,
real world, character of particular places in being congruent with the patterns of events that make up the place. In being congruent, attention to the components of patterns enables the analyst to learn from the particular arrangements and uses of buildings (and towns) and, thereby, to identify just what it is about a particular place that makes it livable. It might otherwise be said that attention to primary and component patterns of relationships that obtain between social processes of action and particular material arrangements supports the specification of functional requirements by grounding architecture in the everyday uses of material structures. Placing emphasis on positive life-giving patterns, the patterns theory provides, in principle, a model of requirements specification that feeds evaluation into the requirements analysis phase (or the work involved in getting to the go ahead moment), as it is predicated on the assessment of existing material arrangements and uses of place.

From principle to practice: developing a pattern language
To go beyond principle to practice, it is necessary to develop some means of identifying patterns and of making patterns publicly available or visible as it were. Alexander develops the theory of patterns into what he describes as a “pattern language” in order to do this. The elements of this language are the patterns of relationships that obtain between social processes of action and particular material arrangements. Each pattern assumes the character of a rule which, in describing some entity, provides instruction as what has to be done to generate the entity which it defines. Thus, and for example, the pattern “bike path” describes distinctly coloured and marked out surfaces that demarcate cycle lanes, which are level with road surfaces and run alongside raised pedestrian walkways. In reading the pattern (and Alexander’s description is obviously more detailed than the one provided here), the reader is instructed in what needs to be done to generate the pattern – to lay and mark out a distinctly coloured surface along the side of the road, for example. As patterns are composed of smaller patterns and combine to form distinct places, the overall array of patterns come to form a system of rules, or a language in the mathematical sense of the word. That is, in the sense of “a set elements and a set of rules for applying them”. Alexander also suggests that the pattern language is a language in the

natural sense of the word. That is, in the sense that just as we can combine the elements of our natural language (words) to form an infinite variety of sentences, then so too can we combine patterns to form an infinite variety of places. This is of course an analogy intended to demonstrate the flexibility of the pattern language framework and should not be taken literally.

To continue the analogy, however, the pattern language consists of more than a system of rules but also, of what might be described as a “grammar” for specifying rules. That is, for producing patterns and coherent sequences or “sentences” of patterns. That grammar consists of a number of formal elements: master sequence base maps, primary patterns, component patterns, pattern format, and pattern recognition.

1. Master sequence base maps. Alexander suggests that when we use a language we employ a network of interconnected elements and that we do so in a sequential manner, moving through the elements (the patterns, in this case) from the larger to the smaller – “from the ones that create structures, to the ones which then embellish those structures, and then to those that embellish the embellishments” (Alexander et al. 1977, xviii). This sequential order – large to small, small to smaller still – connects patterns together to form a network of interconnected elements, a language. What holds the network of elements together, making a coherent whole, are the “master sequences” of patterns (ibid. xxxviii) that define some distinct place, such as a metropolitan region, for example, which is composed of the master sequences: industrial areas, freeways, central business districts, supermarkets, parks, single-family houses, gardens, high-rise housing, streets, arteries, traffic lights, sidewalks, etc. These master sequences combine to form a “base map” (ibid. xviii) of patterns that define some particular place. As patterns exist at different levels then so too do base maps. The analyst may, then, produce a base map for a metropolitan region, or for the particular patterns that compose that pattern, such as an industrial area or central business district, or finer still, a workplace, supermarket, or family house. Base maps summarize and connect the definitive sequence of patterns that combine to make up some distinct place.

2. Primary patterns. Although base maps summarize and connect the definitive sequence of patterns that combine to make up some distinct place, they do not
describe those patterns. Each definitive pattern – each large or primary pattern – therefore needs to be described. Thus, in addressing metropolitan areas the analyst will have describe each of the individual patterns that make up the definitive master sequence: industrial areas, freeways, central business districts, supermarkets, parks, single-family houses, gardens, high-rise housing, streets, arteries, traffic lights, sidewalks, etc. In dealing with the constitutive pattern “arteries”, for example, the analyst will have to described how transportation is organized in the metropolitan area through material arrangements of transport areas: freeways, ring roads, interchanges, local roads, parking, and the web of public transport, for example, thus illuminating the arterial pattern of transportation in the metropolitan area. Primary patterns identify the components which the individual primary patterns that make up the definitive master sequence are themselves made up of.

3. Component patterns. Although primary patterns identify the components which the individual primary patterns that make up the definitive master sequence are themselves made up of, they do not describe those components. Each of the component patterns which a primary pattern is made up of therefore needs to be described. Thus, in addressing the arterial pattern of transportation in the metropolitan area, the analyst will have to describe each of the individual component patterns that make up that primary pattern: freeways, ring roads, interchanges, local roads, parking, and the web of public transport, for example. In dealing with the component pattern “local roads”, for example, the analyst will have to described how the local road network is organized in the metropolitan area through material arrangements of those transport areas: street grids, road crossings, and walkways, for example, thus illuminating the “local road” pattern of arterial transportation in the metropolitan area. Component patterns identify the individual elements of which individual primary patterns are made up. As primary patterns do not describe component patterns, then so too, component patterns do not describe individual components - street grids, road crossings, and walkways, for example – but identifies and connects components together as parts of a coherent whole – as parts of the primary metropolitan pattern “arteries”. Each of the components comprising the component pattern needs to be described in its own terms. Thus, in dealing with the component “road crossing”, the analyst will have to described how local roads are organized in the metropolitan area to permit pedestrians to cross: crossing areas are visibly marked, zebra crossings are
in place, or signalled crossings might be in place, wide roads may be broken by traffic islands, for example. Description of the components that comprise the component patterns illuminates the bundle of relationships or “building blocks” of which primary patterns are composed.

5. Pattern format. The pattern language is constituted in a particular format. Each pattern – primary or component – is presented in the same form in order to provide for the public availability and sharing of patterns.

First, there is a [pattern number, a title and a] picture, which shows an archetypal example of [a] pattern. Second, after the picture, each pattern has an introductory paragraph, which sets the context for the pattern, by explaining how it helps to complete certain larger patterns. Then there are three diamonds to mark the beginning of the problem. After the diamonds there is a headline, in bold type. This headline gives the essence of the problem in one or two sentences. After the headline comes the body of the problem. This is the longest section. It describes the empirical background of the pattern, the evidence for its validity, the range of different ways the pattern can be manifested in a building, and so on. Then, again in bold type, like the headline, is the solution – the heart of the pattern – which describes the field of physical and social relationships which are required to solve the stated problem, in the stated context. This solution is always stated in the form of an instruction – so that you know exactly what you need to do, to build the pattern. Then, after the solution, there is a diagram, which shows the solution in the form of a diagram, with labels to indicate its main components. After the diagram, another three diamonds, to show that the main body of the pattern is finished. And finally, after the diamonds there is a paragraph which ties the pattern to all those smaller patterns in the language which are need to complete this pattern, to embellish it, to fill it out. (Alexander et al. 1977).

An example of the format is provided below.
Introductory paragraph (context and relationship to other larger patterns). Under the impetus of PARALLEL ROADS (23) and NETWORK OF PATHS AND CARS (52), paths will gradually grow at right angles to major roads - not along them as they do now. This is an entirely new kind of situation, and requires an entirely new physical treatment to make it work.

Headline (essence of the problem). Where paths cross roads, the cars have power to frighten and subdue the people walking, even when the people walking have the legal right-of-way.

Body of the problem. This will happen whenever the path and the road are at the same level. No amount of painted white lines, crosswalks, traffic lights, button operated signals, ever quite
manage to change the fact that a car weighs a ton or more, and will run over any pedestrian, unless the driver brakes. Most often the driver does brake. But everyone knows of enough occasions when brakes have filled, or drivers gone to sleep, to be perpetually wary and afraid.

The people who cross a road will only feel comfortable and safe if the road crossing is a physical obstruction, which physically guarantees that the cars must slow down and give way to pedestrians. In many places it is recognized by law that pedestrians have the right-of-way over automobiles. Yet at the crucial points where paths cross roads, the physical arrangement gives priority to cars. The road is continuous, smooth, and fast, interrupting the pedestrian walkway at the junctions. This continuous road surface actually implies that the car has the right-of-way.

What should crossings be like to accommodate the needs of the pedestrians?

The pedestrians who cross must be extremely visible from the road. Cars should also be forced to slow down when they approach the crossing. If the pedestrian way crosses 6 to 12 inches above the roadway, and the roadway slopes up to it, this satisfies both requirements. A slope of 1 in 6, or less, is safe for cars and solid enough to slow them down. To make the ["knuckle"] crossing even easier to see from a distance and to give weight to the pedestrian’s right to be there, the pedestrian path could be marked by a canopy at the edge of the road.

A big wide with several lanes of heavy traffic can form an almost impenetrable barrier. In this case, you can solve the problem, at least partially, by creating islands - certainly one in the middle, and perhaps extra islands, between adjacent lanes. This has a huge effect on a person’s capacity to cross the road, for a very simple reason. If you are trying to cross a wide road, you have to wait for a gap to occur simultaneously in each of the lanes. It is the waiting for this coincidence of gaps that creates the problem. But if you can hop from island to island, each time a gap occurs in any one lane at a time, you can get across in no time at all - because gaps which occur in individual lanes are many many times more frequent, than the big gaps in all lanes at the same time.

So, if you can’t raise the crossing, at least use islands, like stepping-stones.

Therefore:

The solution. At any point where a pedestrian path crosses a road that has enough traffic to create more than a two second delay to people crossing, make a “knuckle” at the crossing: narrow the road to the width of the through lanes only; continue the pedestrian path through the crossing about a foot above the roadway; put in islands between lanes; slope the road up toward the crossing (1 in 6 maximum); mark the path with a canopy or shelter to make it visible.
Tying paragraph (connects pattern to other related smaller patterns). On one side or the other of the road make the pedestrian path swell out to form a tiny square, where food stands cluster round a bus stop - SMALL PUBLIC SQUARES (61), BUS STOP (92), FOOD STANDS (93); provide one or two bays for standing space for buses and cars - SMALL PARKING LOTS (103), and when a path must run from the road crossing along the side of the road, keep it to one side only, make it as wide as possible, and raised above the roadway - RAISED WALK (55). Perhaps build the canopy as a trellis or canvas roof - TRELLISED WALK (174), CANVAS ROOFS (244).

The pattern format and with it, the public availability of the pattern language, articulates generic socio/architectural problems and solutions. The patterns are generic in the sense that they articulate a generally applicable solution to this kind of problem (crossing the road in a busy metropolitan area, say).

Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over.

What is generalizable then, is the particular solution to a particular problem that occurs across particular environments. The particularity of generic solutions is central to the production and sharing of patterns that can be used by others in the design of particular places. Gross generalities are eschewed and emphasis is instead placed on the particular relationships that obtain between particular social situations and the particular material arrangements to which those situations are tied.
6. Pattern recognition. The formatting of patterns relies on the prior recognition of patterns. The recognition of patterns is an analytic exercise, which consists of identifying a relationship between 1) a socio/architectural context or situation, 2) a certain set of forces embedded in the pattern of events that occur in that context and which constitute the problem, and 3) a spatial configuration which allows those forces to be resolved, all of which are expressed by the pattern format. Alexander (1979) uses the example of Ostenfeldgaarden – an old Danish house built in 1685 – to elaborate the analytic exercise. He suggests that the house has some special architectural qualities – some particular positive life-giving properties. The problem is one of “pinning them down” and in such a way that the statement of those qualities is “precise enough to use them over and over again”. He suggests that the house is cosy and spacious but just what that means is rather vague, as such descriptions fail to specify the particular spatial relationships which go make up the cosy and spacious qualities of the house. In order to pin down just what is special about the house (or any other environment) it is necessary to specify concretely the particular spatial relationships that make up the environment and capture our attention, vague expressions of taste and style will not do.

In reconsidering the house, Alexander observes that the main living room of the house contains two alcoves placed along its outer edges which open into the room (i.e. are not separated or shut off from the room) and that each one is big enough to seat two people. Economic as it is, this concrete description specifies for the members of a culture the socio/architectural context of the pattern (domestic environment, living room) and the basic character of the pattern (seated alcoves placed along outer edges of living room). Having identified the context and basic character of the pattern, the analyst needs then to identify the problem which makes the pattern a solution, and a solution of a special kind at that. In the case of the alcoves, Alexander suggests that although family like to spend time together, which is one of the purposes of the living room, nonetheless they each engage in individual activities there: personal hobbies are conducted in the living room, homework, sewing, and the rest. In addition to its family function, the living room also serves as a place to receive and entertain visitors however. The contingent character of receiving guests means that the living room must be kept in a reasonable condition: hobbies, homework, sewing, etc., should not take over the room or turn it into a workroom. The living room is thus subject to a set of competing demands, or “forces” in Alexander’s terminology, which constitute the
problem. Those demands articulate the family function, individual function, and reception function of the living room.

In an ordinary house, with an ordinary living room, these three forces are mutually incompatible. The alcove brings them into resolution.

The alcoves are a solution to the problem in that they provide discrete spaces for the pursuit of individual activities and at the same time, in being connected to the living room, maintain the functional integrity of the living room as a place for family activities and the reception of guests.¹⁶

The identification of the problem and articulation of the solution relies on an appreciation of the “forces” at work in a particular place and that those forces consist entirely of the social organization of the environment in question: of the ways in which persons organize places for the doing of events. Thus the living room is organized by members for the doing of family activities, individual activities, and the receiving of guests, for example. The socially organization of place consists of the pattern of events (the doing of family activities, individual activities, and the receiving of guests, for example) that make up and give life to a place and it is with respect to the relationship that obtains between these patterns of events and material arrangements of place that Alexander says that patterns are “true” or “false” – i.e. are empirical statements of fact.

The statement that a pattern is alive, is thus not a matter of taste, or culture, or point of view. It establishes, instead, a definite empirical relationship between a limited context, a set of forces which occur there, and the [material] pattern which resolves those forces.

It might otherwise be said that patterns are “discoverable” things then - things that may be seen and recognized through observation. Observation precedes the identification of problems and solutions, though like the identification of problems and solutions, observation is an organized analytic activity. How is the observation of patterns – of the reoccurring relationships between socially organized patterns of events and material arrangements of place - organized?

Observation initially proceeds through the classification of particular material arrangements, such as entrances to buildings, in simple terms of “those that feel good”

¹⁶ In specifying solutions Alexander points out the necessity to specify the range of contexts to which the solution applies. Alcoves, for example, are not solution to families who live in igloos, for example.
and “those that don’t feel good”. Following the codification of material arrangements, observation proceeds through the search for common properties – for definitive or criterial properties that occur across the particular arrangements “that feel good” and which are missing from those “that don’t feel good”. Alexander suggests that criterial properties will be highly complex.

It will not be simple, like “all the good ones are blue, all the bad ones are not blue”. In the case of the entrance, for instance, it turns out, in my experience, that all the good ones have an actual place between the road and the front door, a place in which there is a change of surface; change of view; perhaps a change of level; perhaps you pass under a branch, or hanging rose, there is often a change of direction, and there is above all this actual place, halfway between the two, so that you pass first from the street to this place, and then again from this place to the front door.

Nonetheless, on identifying criterial properties the analyst may begin the search for the invariant that makes the good classes (of entrances, for example) solutions to a distinct problem. In the case of entrances, Alexander identifies the invariant at work in good classes as the “transition function”, which permits persons to “clean” off the “street mask” when entering a discontinuous zone (e.g. a house).

Observation is a constructive analytic exercise, characteristically predicated on the discretionary exercise of judgement (of “good” and “not good” classes in this case) and inference (of criterial properties and invariants) As a consequence of this analytic mode of observing the real world, a very common mode that permeates the human sciences as much as the arts, Alexander suggests that it is difficult to know “just exactly what the forces in a situation are”. Thus, this method of observation does not provide a “reliable way of knowing” what the social organization of place consists of concretely. A fortiori, and as Alexander recognizes, the method fails to establish the empirical veracity of problems and solutions.

What we need is a way of understanding the forces which cuts through this intellectual difficulty and goes closer to the empirical core … And we need a way of doing it which is more reliable than analytic formulation. Above all, we need a way of doing it, which is anchored in the empirical reality of what … actually happen[s].

Alexander’s solution to the problem of observation is peculiarly post-modern in flavour, given the logically coherent character of the pattern language framework that emerges despite his beguiling almost poetic if not mystical writing style.

To do this [i.e. anchor patterns in empirical reality], we must rely on feelings more than intellect … The pattern ALCOVE feels good to us, because we feel the wholeness of the system there. There is an intellectual formulation of the forces which alcoves resolve. For instance, they allow us to be private at the edge of a communal gathering, and, at the same time, remain in touch with
whatever is communal there. But what clinches it, what makes us certain that this formulation has some substance to it, is the fact that alcoves make us feel good. The conflict is real, because the alcove makes us feel alive; and we know the pattern is complete, because we can feel no residual tension there.

A more rigorous mode of observation – of identifying the forces at work in particular places and thus, of identifying real problems and solutions - is to proceed, then, through “intuition”. If the analyst is in doubt of his or her intuitions, then they can always ask someone else how a certain pattern “makes them feel”. Alexander suggests that this is not the same as asking someone their opinion, but of establishing the “extraordinary degree of agreement in people’s feelings about patterns”. While we would not dispute the fact that is in persons’ agreements that things become true or false,\(^1\) that does not mean that such agreements are correct. People once agreed (wrongly) that world was flat and that it was placed at the centre of the universe, for example. Agreement does not suffice to anchor patterns in empirical reality, in what actually happens, in socially organized patterns of events and their relationship to material arrangements of place. This is not to dispute the pattern language framework. It is only to say, and not insignificantly, that some alternate, more appropriate method of observation is required. A method that can identify empirically, and not through inference, the real world *patterns of relationships* that obtain between socially organized patterns of events and the material arrangements of place.

**TECHNOLOGY AND THE HOME**

Seen from a technological perspective, the digital age promises to radically transform the shape of social life in general and the home in particular. Debates as to the nature of the coming “digital revolution” vary but are often polemic. On the one side stand the technophiles and other, the technophobes. A tiresome and seemingly endless round of talk between the two “revolutionary” positions posits a) contrasting visions of a future in which technology works to either empower or enslave the global populace, and b) contrasting accounts as to the ways in which technology development should, therefore, be organized (through the free play of market forces or through government regulation, for example). An alternate “post-revolutionary” perspective side-steps such rhetoric and places emphasis instead upon the construction

of digital technologies, many of which do not actually exist yet other than at best as rather unstable prototypes in the research lab.

Furthermore, and in complete contrast to revolutionary points of view, post-revolutionary conceptions suggest that the home of the future will retain much of what is familiar today, which begs the question of radical transformation? As William Mitchell (2000), an architect with a passion for future technologies argues for example, the digital revolution will be constructed on top of the “residues and remnants of the past, like the neural structures over that old lizard brain of ours”. On a post-revolutionary view the digital revolution will be evolutionary rather than radically transformative in character then, building on the present and the past, which combine to form our current legacy. Just what the “digital evolution” of the domestic environment will look like is an open matter. Nonetheless, a post-revolutionary perspective outlines a cogent account of a technical framework that rejects polemic rhetoric and places emphasis instead on the very practical need to contend with the “messy, difficult, long-term task of designing and building [the] future” (ibid.). It is towards a consideration of that framework that we first turn our attention in this section of the report. Despite its cogency, the framework does not offer concrete visions of the home of the future other than in the most general technical terms. The role of Alexander’s “pattern language” in a design context is reviewed as a means of “imagining” the home of the future in concrete detail. Given the clear failings of that framework, we review in particular Alladi Venkatesh’s household-technology model as a means of observing and articulating the real world patterns of relationships that obtain between socially organized patterns of events and material arrangements of place.

A post-revolutionary perspective on the home

A post-revolutionary perspective locates the home of the future within a global digital infrastructure, which is envisioned to provide comprehensive geographical coverage. Multimedia applications running through “high speed pipes” capable of handling giga-, tera-, peta-byte capacities and more will connect geographically distributed sites together in an instant (Mitchell 2000). Connectivity to this “backbone” will be provided through a host of globally distributed “switching centres”. Located in major cities, switching centres will act as round the clock points of connection to the global infrastructure. “Local loops” or intranets will be connected to the switching centres
putting local populations in touch with the world at large. This post-revolutionary vision sees the creation of “intraurban networks” and the “network city” extending to incorporate “wireless backblocks” or rural areas. The home of the future will be located in a local loop or intranet from which the network city is composed. Privacy and security will be provided through the intranet’s “firewall”, which will allow people to configure their online environment and regulate access to the global infrastructure. Significantly, it is envisioned that the network infrastructure will be created by adapting existing satellite and cable-based infrastructures (telephone, television, and even power lines) as the cost of implementing a completely new and dedicated infrastructure would be very high and time-consuming. Evolution rather than revolution is key.

Within this global infrastructure the home will become a “smart place” where a “wireless” domestic infrastructure will allow physical actions to invoke computational processes in tangible objects and connect inhabitants to other smart places.18 This wireless infrastructure will act like an artificial nervous system, allowing inhabitants to control heating, lighting, security, other household management tasks, the use of media and communication technologies, and so on. It will work through development of a wire management system that allows artefacts to draw power in flexible rather than fixed ways and to communicate via wireless transceivers. On top of this internal system will run a host of applications and devices. These will include an array of tags, sensors, readers, and identification devices. These will respond to individual family members media preferences, allow inhabitants to control heating and lighting, be aware of (see and hear) family members’ presence and location in the home, and monitor media usage, for example.19 Computational processes will be embedded in wall-coverings, furniture, projection surfaces, and portable devices, including handheld and wearable devices. A diverse range of applications and application environments will communicate with each through “rhizomic software” and “virtual machines” that will provide uniform execution environments. All these things and more will combine to create a dispersed yet interconnected family of interactive computer-based devices and environments that are responsive to the demands of

18 http://bluetooth.ericsson.se
domestic life in the twenty-first century.20 A concern with wireless computing, portable and wearable devices, sensing and tracking technologies, virtual and augmented reality, etc., dominates current research in domestic technologies as it does in most other domains of technical development. Although research is burgeoning, just how or what ways these technologies are to become the delivery vehicles for a wide range of domestic services is, as Mitchell puts it, “still unimaginable”. We may have the technology, but we don’t know how to apply it. In other words, we don’t know how to construct the home of the future yet, largely because “advancing technology is outpacing people’s ability to deploy it”.21 The post-revolutionary vision, while much more pragmatic than its precursors, is far from complete then, indeed it might be said that is only in its infancy.

IMAGINING THE UNIMAGINABLE: A PATTERN LANGUAGE FOR SYSTEMS DESIGN

The evolutionary perspective furnishes, as yet, but a vision of the future. Like all visions it lacks concrete detail: it is, at best, at target or goal. Just how it might be realised is an open question? Just what steps will have to be taken to make it real are, in detail, at this point in time, unimaginable. Alternatively, it might be said that the evolutionary vision presupposes some degree of change in the organization of domestic activities, which as Junestrand et al. observe “is not fully understood by those involved in the design process”.22 To that it might be added that changes notwithstanding, the organization of domestic activities is not yet understood by those involved in the design process. Thus, not only are those embroiled in development confronted by a situation in which advances in technology are outpacing people’s ability to deploy it but also, and at the same time, they are confronted by a lack of knowledge of the organization of domestic activities which is the locus of change. The technical imagination finds itself suspended between potential futures and the unexplicated ways in which the home is currently organized. Some means of bridging that divide and imagining appropriate technological support for the organization of domestic activities in the future is required. The prima facie technical challenge is,

then, one of developing appropriate means of imagining the future home in concrete organizational detail. Accordingly, Junestrand et al. propose the development of a “design pattern language” to foster the technical imagination through grounding design in “concrete user situations”.

The notion of a design pattern language is drawn directly from the work of Christopher Alexander discussed in the previous section. Junestrand et al. place particular emphasis on the idea that a pattern “describes a problem which occurs over and over again … and then describes a core solution to that problem”. They take the notion of a core solution to mean that patterns provide “generic solutions in terms of systems theory” and that design pattern solutions may, therefore, be applied to all settings “like that” described by the pattern. The relationship between a pattern language and systems theory is further articulated in the design concepts of Simon (1981) and Dahlbom (1997). Following Simon, Junestrand et al. take it that design is a science though unlike the natural sciences the design process is not concerned with how things are but rather, with how things ought to be. The point is elaborated in consideration of Dahlbom who levels criticism at Simon, not for his spurious view of design as a science (rather than as a practical activity that incorporates science), but for failing to fulfil the scientific promise. For Dahlbom, design constitutes an archaeological science of the future. Whereas traditional archaeology creates a portrait of the past by collecting, piecing together fragments, and developing theories to account for earlier life-forms and cultures, the design archaeologist creates a portrait of the future by collecting, piecing together, and developing technological models that simulate life in future environments. Thus, Junestrand et al. tie Alexander’s notion of a pattern language to what life ought to be like in the future given “what is possible in design”.

Informing the production of patterns of what domestic life ought to be like in the future given what is possible in design, is a concern with the sociality of domestic space. Junestrand et al. suggest that the “public and private are no longer strictly separated” and draw the conclusion from ethnographic studies that domestic life is now characterised by a continuous flow “transactions and communications” which are

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interwoven with domestic activities distributed around the home. Drawing on ethnographic studies again, they also note that successful domestic technologies are “absorbed completely into the routines of home life”. Thus, the production of patterns should be informed by the uses of spaces and routine uses of technology therein in the effort to develop future technologies that may be absorb into the continuous flow of transactions and communications that characterise contemporary domestic life. Given the distributed character of domestic activities, Junestrand et al. suggest that the development of future technologies needs to be closely allied to the architectural design of the domestic space. Thus, pattern language solutions will be concerned to support the sociality of domestic activities through the spatial configuration of future technologies.

Junestrand et al. furnish a number of examples of their take on a pattern language in the development of the comHOME – a smart home of the future. Situated in a research lab, the comHOME consists of three rooms: a living room, a kitchen, and a combined home-office and bedroom. To explore the potential of a pattern language with respect to the design of video-mediated communication (VMC) technologies, four comZONES were set up with the express intention of “supporting fundamental home based activities”. The design problem was one of “how should VMC solutions be designed and integrated into a future home environment, with regard to the need for both private and public spaces in the home”. Below we consider an example of the pattern language which is concerned with the setting up of VMC technologies in the kitchen comZONE. Every pattern is structured in terms of a title indicating the character of the pattern and the solution; a picture of an archetypal example, an introduction situating the pattern in context; a headline stating the general character of the problem; a body of text describing the problem in detail; a body of text describing the solution; a diagram of the solution; and connections to other patterns.

The pattern for setting up comZONES in the kitchen is titled the “comTABLE”. The picture displays a several chairs placed round a table, one end of which may be folded upwards and contains an interface. The introduction situates the comTABLE pattern within sitting spaces such as the kitchen, communal eating places, and other existing patterns related to the kitchen. The headline articulating the general character of problem addressed by pattern suggests that “the activity of eating is important for the unity of the family or a group of closely related individuals, and for the social upbringing of children. Getting together for a meal is often difficult nowadays due to
the separation in space of individuals.” The body text underneath articulates the problem in more detail suggesting that the act of eating is a cultural activity full of rituals and common experiences that “everybody knows” and which are important to the cohesion of group life. Modern day living interrupts eating and with it the socialisation of family members and maintenance of family life. Parents work irregular hours, children study elsewhere, grandparents and relatives live at distance. The comTABLE is offered as a solution to the problems of socialisation and group cohesion occasioned by the physical separation group members, be they family, friends or colleagues. The comTABLE allows all the parties sat around a table to see another person located in another place. The representation of the remote other is natural size and when folded up of natural height. When not in use the table may be used as ordinary table. When switched on but laid flat, communication is disabled. Only when the screen is pulled up do communication channels become active. In active mode, the parties sat at the table can see, hear and talk to the remote other, and the remote other can see, hear, and talk those sat around the table. Thus, the comTABLE enables socialisation and group cohesion to proceed. The diagram of the solution displays the comTABLE in active and inactive positions. Connections link the pattern to lighting and image quality patterns.

While there are many things to commend about Junestrand et als. work on a pattern language – such as attending to particular cases in order to develop generalisations, recommending that attention be paid to the sociality of domestic activities and routine uses of technology, and placing emphasis on the spatial configuration of future technologies in the home – we have find this particular take on the notion less than compelling. Granting “intellectual exploration” of the very idea of a pattern language in design, and modest success in promoting spatial configuration in the design of the comTABLE for example, Junestrand et als. configuration of a pattern language appears to lack ecological validity.24 Lacks, that is, adequate reference to real domestic environments, particularly with respect to the sociality of domestic activities. In the above case, for example, we are told that eating is an important cultural or social activity organized through a host of rituals and common experiences that “everybody knows” and which are important to the upbringing or socialisation of

children and group cohesion. Where are those important rituals and common experiences in and through which socialisation and group cohesion is produced? Where is the socially organized work in and through which socialisation and group cohesion “get done” and patterns of everyday life come to be reproduced?

The sociality of domestic activities is not addressed in the description of the “problem”. Instead that work is glossed over, and it is (merely) asserted that persons not being present at meal times is damaging to family life, damage which the proposed solution promises to repair. Yet if we observe absences in the home around the evening meal, as this is often the only group meal of the day in many Western homes, we quickly recognise that it is more often than not for a purpose – dad’s working late, mum’s gone to aerobics, one of the kids is at cricket practice, and so on.

In other words, persons are absent from dinner because they are otherwise engaged, which begs the question as to how they are to be otherwise engaged and talk to the family, friends, colleagues, etc., at the same time? In practice, and as “everybody knows” through common experience, dinner talk with absent parties, and with it some of the constantly ongoing work of socialisation and group cohesion, is suspended until later when there is time to eat, chat, be appraised of, and respond to important group matters. Junestrand et al. patterns are not grounded in the organization of domestic activities then, at least not adequately so but only by passing reference, in this case, to socialisation and group cohesion; important matters which are used as a justification for technological intervention but which do not inform the design of technology as the work involved in socialisation and group cohesion is nowhere addressed by the pattern language. Such patterns as those embodied in the comTABLE are, quite literally, “made up” and that is no accident but a direct consequence of the ways in which Junestrand et al. tie the notion of a pattern language to design.

As noted above, Junestrand et al. tie Alexander’s notion of a pattern language, and with it various problems and solutions, to systems theory and thus, to what life ought to be like in the future given what is possible in design. The pattern language proposed by Junestrand et al. is concerned, then, not with what goes on in kitchens, living rooms, bedrooms, etc. and how those goings on are organized by parties to them, but with what ought to go on in kitchens, living rooms, bedrooms, etc., given technological possibilities. Contrary to assertions, design is not grounded in real patterns of domestic interaction, which constitute the sociality of domestic activities and concrete user situations, but in envisioned socialities and situations which are
narrowly circumscribed and constrained by the technical imagination. Ignoring the sociality of domestic activities, and architectural and technical legacies alike, design is free to impose a host of envisioned technologies on the home with minimal thought or reference to actual patterns of domestic life. In addition to the \textit{comTABLE}, Junestrand \textit{et al.} present us with the \textit{videoTORSO} and \textit{mediaSPACE}, for example, all variations on a theme providing audio/video communications via large screen displays around the home (Figure 11). Thus, a concern with domestic patterns in the future that pays little more than lip service to the present, and to the domestic legacy that current activities are embedded in and organized around, results in the production of revolutionary technologies which require major architectural and infrastructural changes, not to mention significant capital outlay excluding large sectors of the community at large.

\textbf{SMART HOMES}

The revolutionary perspective characterises the vast majority of research, academic and commercial, on what has been called “smart homes”. Under the auspices of technology-driven approaches, the home of the future is configured as an “intelligent” environment. Thus, the home of the future is construed of as a place that senses the presence of family members and disarms security alarms in response to that recognition. Lights are automatically turned on in rooms as people enter and off as they leave. Personal selections of music are automatically played in particular rooms according to particular member’s preferences when they enter. Networks of sensors monitor the well-being of family members located in the home and in other connected environments. Underlying systems warn of impending problems, remind members of
important routines, and even call emergency services when troubles arise. The home of the future also supports energy management and household control, promising to provide large savings in household bills.

Driving these and a multiplicity of similar visions of the future are a host of emerging technologies. Technologies such as “smart floors”, which track any member’s location and launch appropriate application responses by analysing the placement of footfalls. Smart floors are covered with sensor tiles, with each tile having four “load cells” at every corner that measure the force of the user’s foot as they walk over the tile. The underlying system matches the user’s footfall signature with pre-programmed signatures and, on identifying a particular member, launches appropriate computer actions (such as turning the alarm off, playing a particular piece of music, or turning a particular TV channel on). Alternatively, location may be tracked through installing a network of cameras and microphones throughout the home, which relay recordings to a nearby network of computers. Thus, in addition to their footprint signatures, member’s voices, expressions, and physical movements may trigger appropriate computational processes.

Emerging technologies may also be used to make certain parts of the home intelligent spaces, using audio, visual, and gesture recognition technologies in combination with virtual technologies to create smart places for the performance of particular sets of domestic activities. Interaction with smart places and intelligent buildings may be further supported through the development of wearable computing devices providing context-sensitive functionality. Thus, domestic life in the future is situated in an array of computing devices located in the fabric of the building, its internal spatial arrangements and components and even the clothing of its inhabitants.

Such an approach or orientation to the domestic environment is characterized as “technology-driven” as it places technology not people at the centre of design. It is wholly concerned with what is technological possible. Such an approach to design, which underpins the majority of work on domestic technologies, might be described has having a “year zero” mentality. It approaches design as if the home was being

25 http://www.cc.gatech.edu/fce/smartfloor/index.html
26 “‘Smart Rooms’ - Computer Augmented Environments”, http://whitechapel.media.mit.edu/vismod/demos/pfinder/
27 http://www-white.media.mit.edu/vismod/demos/smartdesk/
completely rebuilt, and pays little attention, as such, to constructing the future on top of the present. And not without consequence. -

As with any new technology the initial market [for smart home technologies] is the wealthy. In order for your home to be completely wired so that it can know which room you are in at any point will be very expensive. Initially computer augmented environments will create a disparity between the rich and the poor. The hope is that over time it will generate the same interest such as televisions and VCR’s of the past, and personal computers of today, that it will become a consumer product and found in homes all across the country. Just as the personal computer revolutionised its market by creating a new space for software, monitors, keyboards, chips, etc., smart rooms could possibly revolutionise the motion sensor and digital display markets. Yet the idea to have every family have smart rooms could be unreasonable because it would involve redoing the house - the idea may never be economically feasible (unattributed quote, MIT “Smart Rooms” webpage)

The danger of ignoring our domestic legacy is prescient, yet technology-driven approaches plough on regardless in the “hope” that everything will pan out in the end. Such reasoning, however, arguably ignores one crucial innovation phenomena, namely that people focus on their own activities, not on technologies (Keeley 2001).

What this means is that concentrating on technological possibilities is not enough if usable technologies are to be developed for the home. Like any ensemble of practical actors, home dwellers are not concerned with technology per se but with what may done with the technology and how? As Keeley puts it,

What matters for real people are the quotidian details. How will we get the kids ready for school? What are we going to make for dinner? How will I handle that party coming up? How to help the kids with their homework? Oh, it’s time to mow the lawn, pay the bills, or put out the garbage. So, the locus of innovation needs to change. Instead of developing gizmos, [we] need to design products that fit into [our daily] activities and solve the problems that get in our way, irritate us, or waste our time.

In technologically-driven orders of design there is what might be called a professional ignor-ance of “quotidian details”, of the daily events, situations, and activities that take place within the home. Sheer innovation takes precedence, yet it is the quotidian events, situations and activities that comprise domestic life that innovative technology is ultimately intended to fit into and support. There is, then, something of an inherent tension, a paradox, built into technology-driven approaches to design.

As Keeley suggests, that contradiction may be addressed by attending to “quotidian details”, to everyday life, thus predicating the development of domestic

29 http://www.stanford.edu/~mdutt/cs147_final.htm
technologies on the practical events, situations and activities that constitute the
domestic legacy. Technology-driven approaches may argue that they are deeply
concerned with quotidian details but this demonstrably is not the case. In technology-
driven orders of work, quotidian phenomena observably figure only as resources in
design reasoning, more often than not being used to justify the design of smart rooms
that sense and respond to the presence of members, for example. Little thought is
given to the adequacy of such conceptions in the first place. Do members want smart
rooms that play music when they enter, that turn the lights and TV on, etc? There is,
of course, now way of knowing because everyday life in the domestic realm has not
been consulted. Arguably there is a need then to treat the domestic environment as a
topic as well as a resource in order that the quotidian details of domestic life might be
appreciated in design and appropriate technologies may be developed that are
compatible with the practical events, situations and activities that characterize
“quotidian life in the home”.

Supporting innovation: developing the future through studying the present
Recognition of the need to attend to the quotidian details of domestic life in
undertaking technology development has slowly been gathering momentum over
recent years. The HomeNet field trial was one the most notable early attempts to get to
grips with the primordial challenge of how to make or devise electronic artefacts and
services that add value to our domestic lives.31 HomeNet provided forty-eight low to
middle income families with a computer, a high-speed modem, extra phone lines and
free internet accounts in order to consult domestic activities concerning internet use
and inform the development of appropriate technology services. The project was
highly political in character, as it was expressly concerned to introduce the viewpoints
of typically under-represented, even excluded, user groups into the technology debate.
The guiding assumption at work here was that such groups may have different needs
than the wealthier classes and that the take-up of new technology may be promoted in
developing an appreciation of those needs as the technology becomes cheaper and
filters down into the wider market.

Consultation was performed through the longitudinal analysis of internet traffic, analysis of various questionnaires, analysis of the project’s newsgroup archive and a log of help requests, and through interviews with the participants. The products of analysis were a range of predictors concerning demographic patterns of internet usage amongst various socio-economic groups. Thus, and for example, it was concluded that

The *HomeNet* study shows that once financial barriers are lowered, lower-income, less-educated people are as likely to become enthusiasts. However, race and gender remain associated with internet use; males (especially teens) and whites are the heaviest users.

Or again,

Teenagers were often also the heaviest users in their families while becoming sources of expertise within the household and catalysing internet use by other family members … the family dynamics that characterize teenagers’ interactions within families influence the diffusion of home computing.

Although producing a body of generic findings that were “sufficient for marketing purposes”, Kraut *et al.* felt that the *HomeNet* trial was “unsatisfying from a scientific perspective”.

What is it [for example] about teenagers in general – white teenage boys in particular – that makes the internet so appealing to them? … One possibility is that our sample, selected to target teenagers’ families, might have wanted internet services mainly to give their college-bound children a step up (many of the seniors did, in fact, go to college). That goal could have affected family use … Or it might be that internet content, which was mainly constructed voluntarily by young white males, is mainly attuned to the interests of young white males. Or is it that young white males can get more of the necessary skills and technical support from their peers?

The nub of the matter is that the study didn’t tell them. Thus, Kraut *et al.* found the *interactional dynamics* of domestic uses of technology utterly puzzling yet it was, and is, just this phenomenon that is crucial to the further development of future technology services as it evidently provides the motivation and context for technology adoption and usage. It might be said that the source of this problem is a problem of the method of consultation. Consultation in the *HomeNet* trial was not direct but conducted through the aggregation of statistical results, documentary traces, and *post hoc* accounts. The interactional dynamics of domestic technology usage were never inspected as the methods employed ruled such an exercise out. As a consequence, knowledge of the interactional dynamics of domestic technology usage is substituted for knowledge of generic demographic patterns of domestic technology usage, which are of some utility to marketing but not to design.
An alternate approach towards consulting the domestic environment, and the interactional dynamics of domestic technology usage in particular, is articulated by Alladi Venkatesh.\textsuperscript{32} Venkatesh situates the consultation exercise within the context of “production and consumption”. On this view, the interactional dynamics of domestic technology usage are located in the production and consumption processes of the home. This orientation to the domestic environment sees certain household activities as production activities – the making of a family dinner, for example – and other connected activities as consumption activities – such as eating the family dinner, say. The two types of activity combine to form distinct production and consumption processes within which domestic technologies are embedded. Production and consumption processes are said to be “socially organized”, at both a macro level, being related to the wider social order of civil society, and at the micro level, in terms of the particular domestic order of the home. Thus, the interactional dynamics of domestic technology usage are said to be socially organized in terms of particular domestic configurations of production and consumption and wider social trends.

If we are to appreciate the quotidian dynamics of domestic life, including those implicated in technology usage in the home, the task becomes one of identifying the production and consumption processes of the home and the socially organized interaction dynamics of embedded technology usage. Venkatesh suggests that in order to do this it is critical to identifying actual “patterns of use” through ethnographic inquiry.\textsuperscript{33} Identified patterns of technology usage are to be articulated through a distinctive analytic framework, which is intended to sensitise designers to the social organization of domestic technology usage.\textsuperscript{34} Underpinning the framework is the notion that attention to current patterns of use will serve to ground innovation and the design of new technologically-mediated production and consumption processes in the lived reality of domestic life. Thus, the framework is intended to support the design of “relevant” and “appropriate” domestic technologies through building the future on top of the present.


Venkatesh’s framework construes of the home in terms of “two main interlinked components”. On the one hand is the “social space” in which household activities occur, and on the other is the “technology space” in which household technologies are embedded and used. Venkatesh suggests that the social space is structured, following the sociologist Talcott Parsons, in “functional” terms of a division of labour and attendant roles, and the “sub-environments” (i.e. discrete spaces) in which particular domestic activities take place. “Function” here refers to the ongoing production and maintenance of social cohesion or order, domestic and civil. The technical space is structured in terms of a system of tools, the configuration of tools in specific sub-environments, and the socially organized uses of specific technologies in the performance of domestic activities. The connection between the two components of the model is articulated through specifying the human interaction that takes place in the social space and with the components of the technical space.

Importantly, what constitutes “technology” in this model is not simply a computer but the wide range of artefacts and material arrangements that are deployed in the course of the performance of domestic activities. As Venkatesh and Nicosia describe the matter,

> our household-technology model looks at a whole range of technologies, giving us the opportunity to examine computers in relation to other technologies ... in order to understand the adoption/use issues of computers, one must view the total technological space of the household. Otherwise, very little insights will gained by looking at computers alone. (emphasis added)

Adopting a wide focus to the study of the home, Venkatesh and Nicosia found that the computer was far from the most functionally important domestic technology, sociologically construed. Such mundane technologies as the refrigerator are crucial to domestic life, however, as members rely upon food for their continued well-being, for example. Similarly, telecommunications enabling contact with other family members and friends, or for use in emergencies, have a high functional priority in the domestic environment. Or again, taking the children to school, going to the doctor’s, getting the groceries, and the doing of a wide range of other family-relevant activities rely on the use of some form of transportation. In examining the functional value of actual patterns of technology usage, Venkatesh observes that most domestic technologies are

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geared towards the production rather than the consumption process. This, he suggests is a major finding for design, the implication being that there is a gap in the market (as it were) for technologies that support production processes in the household, particularly technologies adding value in terms of the achievement of functional goals, performance efficiencies, time savings, and reductions in manual labour.\(^{36}\)

In reporting on the domestic relevance, ordering, and practical significance of technology usage, Venkatesh and Nicosia observe that

> technologies are not passive objects in the technological space, they are live, full of meanings for the members of the families who use them.

Unfortunately, the household-technology model does not inform us as to just what that live body of meanings, which motivates and incorporates technology usage into the milieu of domestic activities, consists of concretely and it fails to do so as a direct consequence of replacing members’ meanings with *analytic formulations of functional value*. In other words, in failing to explicate members’ formulations of meaning, the household-technology model does not describe and (thus) make observable the interactional dynamics - the actual patterns of technology usage - that constitute and display the lived reality of domestic life. What the model does do, and commendably so, is articulate a coherent approach towards observing patterns in placing emphasis on the *ethnographic study* of the quotidian details of domestic life, the wide range of technology uses within the ongoing and unfolding flow of domestic activities, and the relationship of technology to the interaction implicated in the daily production of “life at home”. Thus, the household-technology model provides an

\(^{36}\) We must, of course, be careful when talking of the home in terms of production and consumption. The home is not at all like the workplace, however, and it is not concerned with the delivery of a product as such. Insofar as the notion may be invoked, then it might be said that in contemporary society, regardless of the type of domestic unit, gender, sexual orientation, race, creed, physical ability, age, or whatever else, persons embedded within the home are widely concerned with the ongoing production, management, and care of normal, natural human beings and human environments. We take that to be a primordial, self-evident and common concern for a great many people. The products of domestic life are exceptionally valuable products then, whose rationalities of production, efficiencies, labour costs, material needs, and the rest, cannot be adequately appreciated in terms of workplace criteria of production. Nonetheless, and with appropriate caution, the notion of production is of some value here, drawing our attention to the wide variety of socially organized processes involved in the daily production of normal, natural human beings and human environments; processes within which new technologies will be embedded and should, as such, be responsive to. Indeed, it might be said that the production, management, and care of normal, natural human beings and human environments should constitute the primary locus for design, although just what that might mean concretely is not a settled matter but will the outcome of empirical inquiry.
observational framework that compliments Alexander’s pattern language for the
identification of the finite patterns of relationships which obtain between action
(social space) and domestic space (technical space). While articulating a cogent
observational method, the household-technology model nevertheless fails to specify
what just what patterns of relationships are in the home, and what they consist of in
socially organized details of interaction and technology usage, as a result of an
approach to analysis that places an emphasis on the functional value of domestic
technologies. While accepting the basic tenants of the household-technology model
(placing emphasis on the ethnographic study of the quotidian details of domestic life,
the wide range of technology uses within the ongoing and unfolding flow of domestic
activities, and the relationship of technology to the interaction implicated in the daily
production of “life at home”) there is, then, a need for a different analytic approach
capable of handling in observable and reportable detail the interactional dynamics of
technology usage within the domestic environment, the essential sociality of which
merits a turn to social interaction perspectives on the home, and its resident
technologies.38

SOCIAL INTERACTION

Venkatesh and Nicosia’s observation that technologies are not passive objects in the
home, but “full of meanings” for members’, is astute and apposite. Technologies
come to be appropriated by members and be assimilated into the daily milieu of
domestic activities through the meanings members’ come to attach to them. The use
of desktop computers in the home, for example is motivated and regulated by the
meanings members’ attach to it - that the computer is an “educational” or
“communication” tool or something that the kids “waste time” on, for example. It is

37 It should be noted that insofar as the household-technology model compliments Alexander’s pattern
framework, then it changes the focus for purposes of system design from material arrangements of
place to technological arrangements of place broadly conceived.
38 The household-technology model is predicated on Talcott Parsons’ “social action” model, which
exacted considerable purchase in the social sciences during the 1950s and 60s. Today, however,
Parsons’ framework has fallen into professional disrepute, largely for political rather than analytical
reasons. Parsons’ “functional” model of social action was largely criticised for its conservative
character, something that did not sit well with the calls for radical social change that characterised
social science in the 1970s. While not treating Parson’s directly, general analytic inadequacies of his
model of social action, and Venkatesh’s household-technology model, are addressed in the following
section.
not that the computer either assumes one of these meanings or the other but rather, at
different times for different members it assumes all of these meanings, and its use is
thus woven into and regulated within the milieu of domestic activities: into the doing
of homework, sending an email to granny, playing games and being turned off to stop
the playing of games, etc. Members come to adopt technology and organize its use
through the meanings they attach to it then in the course of conducting their daily
affairs. Those meanings are constituted in, and at the same reflexively constitute, the
interactional dynamics of technology usage. In its use in the “doing of homework”,
for example, the meaning of the desktop computer as an “educational tool” is
constituted by members and drives their interactions with it, recurrently so such that
certain patterns of technology usage emerge in the home. In substituting members’
formulations of meaning for analytic formulations of meaning regarding the
sociological value of technology, Venkatesh’s household-technology model fails to
identify the interactional dynamics and emergent patterns of technology usage in the
home. This failure leads us to consider an alternate approach to the sociological study
of meaning in a domestic context.

**Studying members’ meanings**

Although the home is of crucial significance throughout our lives there has, until quite
recently, been little in the way of detailed empirical research of living domestic
environments. Contemporary approaches to the study of meaning in a domestic
context locate meaning in members’ lived experiences of domestic life. While they
are, in our opinion, right to do this, we have certain reservations about the way in
which members’ experiences are located by many sociological analysts and (thus)
about the ways in which meaning and with it, technology usage, is accounted for by
such approaches. Following the feminist and post-modern turns in the social sciences,
which have eschewed “scientific” methodologies of investigation on the basis of their
“malestream” and “authoritarian” character (Nicholson 1989), inquiry into members’
meanings proceeds through considerations of such things as their autobiographies,
testimonies, personal histories, memories, and other forms of “reflexive” account

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39 Historically, the home has been considered universal to all cultures and its study has traditionally
belonged to the domain of Archaeology, which is mainly been concerned with the history and
development of human material culture.
In the context of feminist and post-modern inquiry, reflexive essentially means “self-reflective”, and so the meaning of the home is established through consideration of members’ reflections on their experiences of the domestic space and its organization. While we might take issue with the self-reflective notion of reflexivity, as the accounts it generates are essentially and without remedy post hoc in character, of more concern is what is done to these formulations of meaning in analysis. Specifically, what concerns us is the practice of treating members’ formulations of meaning – be they of a self-reflective or interactionally reflexive character – as resources which may be used to construct professionally reasoned and, for the analyst, ostensibly reasonable formulations of meaning. Under the auspices of feminist and post-modern inquiry, we are presented with accounts of the meaningful character of domestic life that are twice removed from the lived experiences that constitute members’ daily life, and which implicate technology in the nexus of domestic praxis. The lived experiences of members’ are removed once by themselves in their self-reflective formulations of meaning and removed again by sociological analysts in treating members’ formulations as resources with which to construct professionally defensible formulations of meaning. Thus, the meaningful character of domestic life, which drives technology adoption and usage, is glossed over and replaced by or substituted for remote analytic formulations of meaning (such as Venkatesh’s formulations of functional value).

An alternate approach to the study of lived experience and the production of meaning is offered by phenomenology/ethnomethodology. From this point of view, the home is an active environment which consists of ongoing processes and events that shape people’s experiences. The primary interest here is to identify the dynamic processes and courses of events that transform the bricks and mortar building into an

41 The self-reflective notion of reflexivity contrasts with the interactional notion of reflexivity we employ, which is concerned with the in vivo production of meaning and thus with the actual interactional dynamics of technology usage. Self-reflective formulations of meaning “miss” those dynamics for although such formulations are rightly treated as features of meaningful activities, circumstances and events, they do not describe the activities, circumstances, and events of which they are a feature. Instead, and at best, self-reflective formulations of meaning make only passing reference to the activities, circumstances, and events from which they emerge. Thus, the interactional dynamics whereby meanings are generated are “missed out” of self-reflective accounts (Czyzewski 1994).
object that is experienced as a “home” (and not an “office”, say) in the everyday sense of the word. In particular, this perspective focuses on the home’s significance as a common-place or widely known, and taken for granted arena for action. The common-placeness of the home provides for the intelligibility of members’ reflections, indeed those reflections presume the common-place character of the home yet rarely make mention of it. Instead, we are offered accounts that emphasize the “continuous play of difference” between family compositions, gender relationships, sexuality, personal identities, and the rest.42 While not denying differences in the social organization of domestic life, we draw attention to the fact that the intelligibility of new and old “diasporas” of home alike trade on the presumption of a social environment known in common, the common-place character of which is all too often ignored.43 What is this common-place, widely known, and taken for granted environment? What does it look like? What processes and events is it recognizably composed of? How are members involved in these processes and events? These and a host of other common-place phenomena on which post-modern accounts trade yet ignore, shape members’ experiences of the home and constitute the original locus of meaning.44

Meanings specifically emerge from temporal processes implicated in members’ assimilation the home, of the ways in which the make the home responsive to the demands of life, which shape post hoc reflections. Housework, maintenance, decorations, furnishing, and other investments of time, money, and energy, all bear witness to people’s need and efforts to assimilate the bricks and mortar building and turn it into a meaningful place readily recognizable as “home”. In contrast to continuous plays of difference, the phenomenological perspective places emphasis on the underlying permanency and continuity of the home as a common-place environment widely known and taken for granted by members as a direct result of their ongoing efforts to assimilate the bricks and mortar building in which they live. Whether or not a family is composed of a heterosexual couple and children, gays or lesbians, English, Chinese, Afro-Caribbean, or Asian members, able or differently-
abled people, etc., all eat, sleep, relax, entertain, do daily chores, raise children, have disputes, fall out, make up, and get on with their lives in common-place ways. Indeed, it is in the course of conducting the everyday business of “getting on with life” that the home comes to be assimilated and constituted as a common-place environment widely known and taken for granted by members. It is in the context of the common-place activities (positive and negative alike) that getting on with life consists of, that members’ experience the home and come to attribute meanings to the environment, its members, and the things it comprises, including technology. These activities constitute the domestic legacy and tie that legacy and potential futures together. As a consequence of substituting members’ formulations of meaning for remote analytic formulations, these common-place activities remain to be addressed by professional social science.

ADDRESSING COMMON-PLACE ACTIVITIES

It might otherwise be said that the effect of the standard methodological research practice of substituting members’ formulations of meaning for professionally defensible formulations is to produce a significant gap in the professional literature. As Heritage puts it,

[This gap] consists of all the missing descriptions of what [common-place] activities consist of and all the missing analyses of how practitioners manage the tasks which, for them, are matters of serious and pressing significance.

The late Harvey Sacks is reported to have described this gap as consisting of the “missing interactional what” of organizational studies (be they of the home, the workplace, the musical ensemble, whatever). In substituting members’ formulations for remote analytic formulations, the interactional dynamics and emergent patterns of

49 Garfinkel, H (unpub. manu.) “About the missed orderliness of ordinary activities”, University of California Los Angeles: Department of Sociology and Anthropology.
technology usage are glossed over, passed by, and otherwise ignored by a great many professional accounts then. Thus, and as Button puts it,

Instead of examining what it is about human activity and human interaction that makes technology the recognizably distinct phenomena it is understood to be by those who design it, make it, use it, write and talk about it, an analysis of the posited shaping forces [including such things as formulations of functional value] can end up taking precedence, and technology itself can thus become merely another incidental arena in which to observe them at work. 50

In other words, the interactional dynamics of technology usage “vanish” from view to be replaced by abstract “shaping forces”. Instead of engaging in the methodological practice of substitution, we might instead take the methodological step of making members’ formulations the principle object of analysis insofar as it is within this nexus of live meanings that technology indisputably comes to be adopted and woven into the fabric of daily life. Thus, we might make the methodological election to investigate the relationships that obtain between action and technology as those relationships are made available in members’ formulations of meaning.

Formulations are accounts or descriptions. They may be produced in the course of reading or hearing a text or, as is more often the case, in the unfolding flow of conversation. When we talk of members’ formulations it is their conversational formulations that we are particularly, though not exclusively, concerned with. Our first methodological policy is to attend to the talk that takes place within the home then. In attending to talk it is observable that, along with whatever else may be happening, one of the things that conversationalists are doing is articulating what it is that they are doing, what is going on, what project of action they are together engaged in. 51 This practical course of articulation is what the notion of a formulation specifically refers to – it is the object of our attention to conversationalists’ talk as it displays the interaction being engaged in by the parties to the talk. Gubrium and Holstein provide us with a readily intelligible example.

Committal Judge: They care about you at the hospital, Conrad. Those people really do. They can give you the kind of love and attention that you seem to be missing when you’re living on your own. You don’t have a family to love you, so it might be best to take what you can get.

Patient (Conrad): You can’t tell me they care about me like my people. I got people at Briarwood [boarding home], man. They care. They’re my family, man, my people. We’re all in the same boat out there. We got each other, man, just like a family. Why can’t you just let me stay? 52

In this brief exchange we can see a number of formulations: formulations that announce an intention to place Conrad in hospital care; formulations that justify that intention by citing grounds that Conrad has no one to care for him; formulations that counter the grounds cited, which cast Conrad’s fellow boarders as family, as carers; formulations that make a plea against the decision in question. Formulations are recognizable features of conversation then, both for parties to the talk and (and as we have just seen) for parties hearing the talk at other times and in other ways (via a text as above, for example). As Garfinkel and Sacks put it,

formulating is an account-able phenomenon. This is to say that (a) it is a phenomenon that members make happen; that members perform. (b) It is observable by members. (c) In that members can do the phenomenon and observe it, it is reportable … It is not only because members can do formulating and observe it that formulating is reportable [however]. In that members are doing and observing formulating being done, it is reportable; or in that members do formulating and observe that it was done, it is reportable.

As analysts, we can listen to members’ talk then and observe and report their formulations. We can observe and report members’ formulations not because of some special analytic skill but an ordinary one, because we too are members of society who conduct our practical affairs through formulations. We do and recognize formulations all the time. There is no time out from doing and recognizing them. Doing and recognizing formulations is a fundamental feature of our ordinary everyday competence. Indeed we display (or fail to display) our competence through doing and recognizing formulations. As competent members of society and various fields of practical action from which it is composed, we are masters in doing and recognizing formulations, hence the fact that we can hear and subsequently analyse formulations being done by others here and now and at other times and in other ways. 53


53 Obviously there are members of society who, in various ways, cannot do formulations competently. The variety of the ways in which persons cannot do or recognize formulations competently provides grounds for formulations by competent members of a host of categories of ordinary exceptions, such as “child”, “special educational need”, “illness”, “disease”, “mental disorder”, “deviance”, and the rest.
Importantly, and as the above example makes plainly evident, formulations do “work”, or more precisely, members accomplish “work” – i.e. their practical activities – through doing and recognizing formulations. Through the formulations of the committal judge, the patient, and other parties to the committal process, committal decisions are made, for example. Thus, members’ formulations make practical activities visible in real world details of members’ interactions. While formulations do work they are not the work, however, but make the work observable and reportable. Formulations involved in committal decisions make observable that decision-making consists of the work of making a case for a committal, of countering the case, and of making pleas, for example. However, and this is important to recognize, each of these work activities could be accomplished through an endless variety of formulations, some of which may do the work better than others. Analytic attention is not to be accorded to members’ formulations per se, then, but to the work accomplished by members over the unfolding course of doing and recognizing them. It might otherwise be said that while members’ formulations are the principle object of analysis, the work they accomplish is the primary object of analysis.

Members’ formulations are not incidental to the settings they occur within, nor to the circumstances and events they elaborate. In formulating a case for hospitalisation, countering the case, and making a plea against such a decision, members’ formulations elaborate a recognizable setting – a “committal hearing” - for example: a legally accountable and defensible setting for the making of non-voluntary hospitalisation decisions. Members’ formulations are tied to the settings, circumstances, and events they make observable then. It might otherwise be said that members’ formulations are “organizationally embedded” (Gubrium and Holstein 1993). Thus, in attending to the work accomplished by members over the unfolding course of doing and recognizing formulations, the analyst makes observable the organizational context of members’ activities - the situational character of the setting the work takes place in, the circumstances the work occurs in, and the events that compose it. As Garfinkel and Sacks put, in attending to members’ formulations the analyst makes visible the “essentially contexted character of the action of formulating”. By this they do not simply mean to point out the organizational

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character of the work but also, and as a feature of the organizationally embedded
class of members’ formulations, that there exists specific institutional practices
whereby members’ “make up” or construct and thereby organize the work made
visible through their formulations. In doing formulations with regard to non-voluntary
hospitalisation at a committal hearing, for example, the work of the setting is
organized through specific practices of constructing a case, countering a case, making
a plea, and the rest. These actions are essential to the defensible doing of the work,
they are tied to a discrete organizational context, they are done in hearing after
hearing, they produce different results, and guarantee the production of different
results, and in respect of their reoccurrence in the setting assume the status of specific
work-practices.

Members’ *setting specific work-practices* (the specific work-practices that are
tied to the committal setting or the home setting, for example) are the *objective of
analysis.* That is to say that the point and purpose of analysis is to explicate, by
attending to the work made visible through members’ formulations, the work-
practices whereby practical activities are organized in members’ interactions.
Notably, these work-practices are “*equipmentally affiliated*” (Garfinkel 1996) or
material in character, which is to say that they consist of the use of artefacts from pen
and paper, to hammers, machinery, computers, and the rest. The work-practices
implicated in the accomplishment of a committal hearing incorporate a host of
documents, forms, and test procedures, for example, each of which are used in the
common-place accomplishment of the committal process, for example. As attention to
members’ formulations serves to make their work-practices visible, those work-
practices will serve to make *technology usages* visible in observable details of
members’ quotidian interactions then. And as work-*practices* are by common
definition “habitual”, “repeated”, “regular” courses of action done time and time
again, it follows that explication of members’ work-practices in the home
environment will make observable the recurrent ways in which domestic technologies
are implicated in domestic life. In other words, explication of members’ work-
practices will make observable the real world, real time interactional dynamics of
technology usage and with that, the empirical *patterns of relationships* that obtain
between action and technology in the home.

These work-practices and empirical patterns of relationships are not available to
theoretical models as the substitution of members’ formulations for analytic
formulations theorizes them “out of existence” (Garfinkel and Sacks 1970). This loss of real world organizations of action and technology usage is a consequence of drawing a distinction between common sense knowledge and scientific knowledge, which sees the substitution of members’ setting-specific formulations for professionally reasoned ones which seek to comply with the canons of generic representational theorizing (Garfinkel 1996); hence electing to start our study of the home from a historical rather than a scientific point of view. If we are to have any chance of explicating the finite patterns of relationships that actually and observably obtain between action and technology in the home, we must attend to members’ work-practices. Scientific methods make that very difficult if not impossible to do, for as a matter of practice scientific methods substitute members’ formulations, and with them their work-practices, for professionally defensible ones.

Instead of consulting members’ work-practices through scientific practices we are required, then, to learn what those practices are “by consulting members” (Garfinkel and Sacks 1970). Whatever “method” we employ to locate members’ work-practices must satisfy this constraint. Consequently, we make the methodological election to attend to members’ formulations, thereby consulting members directly and in observable and reportable details of their daily interactions. We do not employ members’ formulations to accomplish empirical description of organizational phenomena (such as patterns), however, or to achieve the justification and test of

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55 This, of course, leaves us open to the criticism that our approach and its findings are not “scientific” – i.e. that our approach lacks rigour (exactness or accuracy) and that our findings are (therefore) highly subjective. This assumes that the only way to produce knowledge in a rigorous way is to employ what are largely “positivist” methodologies, which place an emphasis on “discovering” and “explaining” phenomena through the use of standardized methods of measurement and theory construction. While we acknowledge the legitimacy of such approaches, we point out that they are not the only ways in which rigorous knowledge may be produced. Positivist models of inquiry assume that like the natural sciences, theories are required to render observable phenomena intelligible – the light of a firefly is an observable puzzle that requires a theory to explain its occurrence and within appropriate disciplinary ways (in details of the phenomenon’s chemical, biological, or evolutionary organization, for example). This mode of reasoning, while valid for the natural sciences in that the intelligibility of its phenomena are not given immediately to observation, assumes that the organization of human activities (social, psychological, political, or otherwise) is similarly not immediately observable. Members’ activities and the settings in which they occur are already organized and intelligible for them however, as made observable in their formulations. There is, then, no need to develop standardized measures to inspect members’ activities and settings nor to construct theories explaining the organization of members’ activities as their formulations make a world of organized settings and activities available to rigorous analysis. See Sharrock and Anderson (1991) for a thorough treatment of the issue within the context of the social sciences.

hypotheses, or to construct models, theories, and the rest. Members’ formulations are recommended instead

as resources with which the social sciences may accomplish rigorous analyses of practical actions that are adequate for all practical purposes (ibid., emphasis added)  

Members’ formulations are not, as we have said above, ends in themselves but means to an ends. As “pragmatic moves in temporal orders of actions” (Lynch 1993), they allow us inspect the work of a setting and explicate the specific material practices through the accomplishment of which that work is socially organized in members’ interactions. This formulation may be restated in terms of a sequential order of methodological policies providing for the explication of empirical patterns of relationships that obtain between action and technology in the home.

1. Attend to the talk that parties to activities in the home engage in.
2. Describe, through ordinary practices of textual transcription, the formulations members’ produce and recognize in their talk together.
3. Describe the work accomplished by members through those formulations of meaning.
4. Describe the work-practices whereby that work is observably organized by members’.
5. Explicate the patterns of relationships that obtain between action and technology as made observable by members’ actual work-practices.

Consulting members' formulations of meaning

It is one thing to recommend consulting members’ formulations as a means of explicating empirical patterns, another to do it. How is consultation to be done? By what approach or “method”?

ETHNOGRAPHY

Following Venkatesh, we advocate an ethnographic approach be taken towards investigating the home and consulting members’ work-practices. Ethnography is a

56 Including the practical purposes of design.
traditional social science research method, emerging from anthropological considerations of the “tales of faraway travellers” which, as Malinowski described it, transformed a sensational, wild and unaccountable world of “savages” into a number of well ordered communities, governed by law, behaving and thinking according to consistent principles.

Ethnography, as originally developed by Malinowski, was a discipline directed towards the direct empirical study of those “well ordered communities”, particular the ways in which they were well ordered or organized in the practical day-to-day activities and interactions of their members.

By the end of the 1920s the approach was adopted for domestic employment by members of the Chicago School of Sociology. The shift to domestic employment followed the initiation by Robert Park and Ernest Burgess of a wide-ranging programme of research into the social organization of urban life in Chicago. Gathering a rich seam of data on a wide variety of topics, Park outlined the ethos of the research programme to his graduate students as follows.

You have been told to go grubbing in the library, thereby accumulating a mass of notes and liberal coating of grime. You have been told to choose problems wherever you can find musty stacks of routine records based on trivial schedules prepared by tired bureaucrats and filled out by reluctant applicants for aid or fussy do-gooders or indifferent clerks. This is called “getting your hands dirty in real research”. Those who counsel you are wise and honourable; the reasons they offer are of great value. But one more thing is needful; first-hand observation. Go and sit in the lounges of the luxury hotels and on the doorsteps of the flophouses; sit on the Gold Coast settees and the slum shakedowns; sit in the orchestra hall and in the Star and Garter burlesque. In short, gentlemen, go get the seat of your pants dirty in real research. (Cited in Prus 1996)

Park’s injunction to “go get your hands and the seat of your pants dirty” – i.e. to conduct research through first-hand observation - quickly proved itself to be a fruitful means of developing a rich portrait of the social organization of urban life.

Ethnography enjoyed considerable success in domestic sociological employ until the 1940s, when the urge to professionalise the social sciences saw a rejuvenation of positivist methodologies. The approach was subsequently assigned a minor role in social research, largely being confined to conducting “pilot surveys” prior to issuing questionnaires. The work of the late Herbert Blumer highlighted serious problems

with the survey approach to social research, and, again under the auspices of the Chicago School, ethnography enjoyed a return to prominence.\textsuperscript{59} The 1980s saw ethnography being utilized in systems design. Following the pioneering work of Suchman (1987) in human-computer communication, interest developed in the approach as a method of requirements analysis (Luff \textit{et al.} 1993).\textsuperscript{60} The changing character of systems usage – which saw demands for the computer to move from the research lab into the world of work and support a vast array of ordinary human jobs – propelled interest in the approach, particularly in light of the recognition by system developers that the success of design has much to do with the social organizational context into which systems are situated and used (Grudin 1988; Goguen 1993).\textsuperscript{61}

Systems are used within human environments which are, whatever technological characteristics they may possess, essentially social in character. Placing emphasis on the observation of practical activities and interactions as they occur within their natural settings (on the street, shopfloor, in the office, or kitchen, etc.), ethnography promised to lend itself well to the effort to bring a social perspective to bear on system design. Without promising to solve the “wicked problems” that beset design, the main virtue of the approach lies in its ability to make observable the real world sociality of a setting.\textsuperscript{62} As a mode of social research, ethnography is particularly concerned to produce rich portraits of the practical activities and interactions of social actors within specific contexts. Ethnography is a naturalistic method in that it relies upon material drawn from the first-hand experience of a fieldworker immersed in the daily activities and interactions that constitute a setting’s “work”. The purpose of immersion in this horizon of ordinary human jobs is to enable systems designers to develop a concrete appreciation of 1) the work of a setting, and 2) the ways it in which it is organized by parties to it in their interactions (within which future systems will


be embedded and transform but rarely dispense with). Ethnography is a resource in design intended to assist developers in 3) conceptualising appropriate technical solutions that meet the practical day-to-day demands of the setting’s work then.

**ANALYTIC ORIENTATION**

The conceptual function of ethnography in design suggests that the approach is not so much a “method” as a form of analysis. As Shapiro puts it,

> While “ethnography” as a term strikes a useful contrast to traditional methods of requirements capture, within sociology and anthropology themselves it denotes rather little. It marks a distinction between quantitative and qualitative approaches to social science and carries with it a commitment to a period and degree of immersion in the social setting being studied that is sufficient to reach a qualitative understanding of what happens there. These are important matters, but beyond this, ethnography can be put to the service of virtually any theoretical school: there are, for example, functionalist, structuralist, interactionist, Weberian and Marxist ethnographies.

The term ethnography denotes neither a unified method nor a coherent school of thought. Rather, and as Shapiro makes clear, the term ethnography is a gloss on various and different analytic orientations or frameworks. In turning to ethnography, then, systems designers are turning to a varied and competing array of analytic frameworks, not all of them theoretical in character (i.e. not all of them positing models explaining the social organization of various phenomena). One such framework is the ethnomethodological one which has, to use a phrase of Shapiro’s, “dominated” ethnographic research in a design context in light of Suchman’s work. As Shapiro puts it in accounting for the framework’s purchase in design,

> ethnomethodology sets for itself a strict agenda which separates it in certain ways from most mainstream social science. It insists on a rigorously descriptive rather than theoretical program, or an explanatory one (in the sense that most social sciences would understand it). This lends it its strength in producing rich descriptions of work-in-context.

Ethnomethodology rejects theory as it has no work for theory to do (what is written here is an exercise in practical not theoretical reasoning – we offer no model of the world but corrigible observations with which to conduct our reasoning about the world). Ethnomethodology has no work for theory to do for as noted above, members’ activities and the settings in which they occur are already organized and intelligible to

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members as made observable in their formulations. Unlike the objects of natural science, these formulations are immediately available to the analyst as he or she is also a member of society and various fields of practical action from which it is composed.64 There is, then, no need for a theory of members’ activities as there is nothing that requires explanation – members’ activities and settings are already organized and intelligible for them and the analyst, insofar as he or she is already a practitioner in or is otherwise prepared to learn of members’ crafts. We do not need a theory to understand the organization of members’ activities and settings then, but rather, need to explicate members’ activities and settings and with that, the social organization of their activities and settings, as made available by their formulations. The explication of members’ social organization of their activities and settings provides ethnomethodology its purchase in design, making available in real observable details, the work of a setting and its organization in details of daily work-practice. In such details designers may grasp “what is really going on” in a setting, “what is really the problem” about doing the work, and what order of instruments might therefore be devised to support the accomplishment of these quotidian accomplishments and organization of activities.65

The work of explicating members’ work-practices, and with that the patterns of relationships that obtain between action and technology, consists of the describing just how and with just what materials parties to the work construct, assemble or put the work together in the unfolding flow of their daily interactions. Focus on the unfolding flow of interaction brings the emphasis to bear that the home (or any other domain) is an ongoing and developing project constructed through the concerted activities of the parties to its daily work. It may seem strange to conceive of the home as an ongoing and developing project of work. However, as noted above, the characterisation of “work” refers to the practical activities that go on in and make up the setting. The

64 Naturally the availability of members’ formulations to the analyst presupposes that the analyst is competent in the field of practical action under study. While many fields of practical action are available to the analysts as a competent member of society, others (such as quantum physics, astronomy, or jazz, for example) may require special training. In order to see the work that members’ formulations do, the analyst may, then, be required to learn of the practical craft they elaborate. This, of course, is the point and purpose of ethnographic inquiry – to learn of, and convey to designers, the craft or skill human jobs of work consist of and the work-practices that craft is composed of and organized through.

home is not a work domain in the sense of a commercial organization, then, although commercial activities may get done in the home, but in the sense of the home being composed of and constructed through members’ concerted practical activities: getting up and ready for work in a morning, making breakfast, taking the children to school, cleaning the home, making lunch, receiving guests, making dinner, doing homework, watching TV, going to bed, etc. These practical activities, and more, compose the “work” of the home and it is in this sense that we speak of the daily work of the home. We observe too that practical activities in the home are not immutable. The home is a continuously though gradually changing environment, being shaped by the composition of household members and their needs (e.g. by the needs of families with young children, or teenagers, or by the needs of parents when children leave home, or by the needs of young people living together, or old people, or people with special needs, etc.). Thus, it might said that the home is shaped by the “stage and state of life” its members are engaged in negotiating. Stages and states of life are ongoing, unfolding, and flow from one another as developing courses of action and it is in this sense that we speak of the home as an “ongoing and developing project”. Naturally the work of that project will be different according to the stage and state of life any particular household’s members find themselves in and, as constituent features of that stage and state, according to the physical and material circumstances of life within which their daily work is situated.

In considering the many and varied stages and states of life in the home, we encounter the following grossly observable fact: that the domestic environment is ostensibly organized by members in terms of daily routines, which are tied to the particular stages and states of life they elaborate. Routines are the outcome of meeting the demands placed on household members’ by the stage and state of life they find themselves in. They enable mundane yet essential activities to “get done” in a timely and effective manner, time and again, day after day. Parents must go to work, for example, much as children must go to school, and members organize these and a host of other daily accomplishments through constructing routines. Notably, the construction of routines enables household members to coordinate and (thus) conduct

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66 Commercial organizations are also constructed through members’ practical activities, though those of the workplace are obviously very different to those of the home.
67 These routines will, of course, be culturally bound – i.e. they will be not necessarily apply across different cultures or societies.
their daily activities in an orderly rather than a haphazard way. In getting up in a morning, household members may take the same routine turns in using the bathroom for example, thus ensuring that they get to work on time. Routines are also interwoven with the use of technology: the technologies of the bathroom (showers, razors, toothbrushes, etc) and the kitchen (toasters, kettles, radios, etc.) are implicated in daily routines of getting up and getting ready for work, for example. In this respect it might be said that routines articulate primary patterns of relationships that obtain between action and technology in the home. And, furthermore, that in details of the work-practices from which they are constructed, routines articulate component patterns of relationships that obtain between action and technology in the home. In getting ready for work, for example, practices of using toasters, kettles, radios, etc., make observable what the components of the routine consist of as an organized job of work. Thus, routines not only articulate primary patterns but component patterns and in real world details of their composition. Further still, just as technologies are distributed around the home, it might be similarly observed that routines are distributed around the home: around the bathroom, the kitchen, the living room, the bedroom, etc. Routines are tied, then, to the specific “sub-environments” that comprise the home. If we are to explicate the actual patterns of technology usage that obtain in the home, we need not make an analytic separation between action and technology, pace Venkatesh, but instead describe the routines that occur in specific sub-environments. Domestic routines are constitutive of the home as a discrete social institution – the home is recognizably made up of them, composed of them, organized through them – and they are made available through members’ formulations, which as embedded features of the routines’ daily work therefore elaborate them. The routine character of domestic life allows us to specify a number of other, complimentary methodological policies for the study of the home.

6. In order to explicate patterns, conduct ethnographic study of the home environment through immersion in the milieu of domestic activities that comprise the daily work of the setting.
7. In the course of immersion attend to distributed daily routines within which members’ formulations are embedded and elaborate. These routines consist of and display primary patterns of relationships that obtain between action and technology in the home.
8. In order to explicate primary patterns carefully describe how and with what materials members construct and coordinate their routines as made available in unfolding flow of their formulations.

9. In order to explicate component patterns carefully describe the material work-practices implicated in the construction and coordination of routines.

MODE OF ANALYSIS

It is, of course, one thing to advocate explicating the daily routines of the household as a means of explicating empirical patterns, another to do it. How are daily routines to be explicated? We could say through attending to members’ formulations, as they are embedded features of daily routines, but that raises the issuing of how members’ formulations are to be attended to? Once again we could say by listening to members’ talk in the home and again it could be asked how? By what approach or method of analysis are we to listen to members talk, attend to their formulations, explicate the daily routines of the household, the work-practices those routines are constructed and coordinated through, and, ultimately, extricate the patterns of relationships that obtain between action and technology in the home from amidst all these goings on?

In the first instance we may capture the “goings on” of the home through the use of video. Situating video cameras in the home allows us to record naturally occurring activity while avoiding many of the ill effects of intrusion that may be attributed to the immersion of an analyst (an outsider) in such a private setting. The video material we employ in our study of the home was gathered under the auspices of the ESRC funded Virtual Society? programme.68 Specially adapted miniature digital cameras were placed in sixteen volunteer households and used to record everyday domestic interaction. Several key areas of the home (the kitchen, living room, and study where available) were “wired up” to facilitate continuous video and audio recording and constitute the locus of our current inquiries. Advances in video technology have extended the possibilities of video techniques. Previous attempts at using such methods have suffered from the limitations imposed by the available audio-visual technology, which meant that the technique was of limited utility. Previous work has also largely been restricted to TV media and spatially bounded by a single room. New technologies allow a departure in scale and sophistication, then, making interaction in

68 http://virtualsociety.sbs.ox.ac.uk/projects/morrison.htm
and across multiple sites or sub-environments directly observable, not to mention economically viable to observe.

Up to five miniature, low-light, variable focus remote cameras and video recorders were installed in key areas in each home and up to eight hours of video footage per day, per camera installation, was recorded. Recording equipment was installed in each of the households for a minimum of ten consecutive days per year over two-years. Camera positions and appropriate times for recording were decided following discussions with the families in their homes and with their agreement. In both practical and procedural terms family members provided invaluable help. In many respects household members acted as adjunct researchers, determining when and where observations should be made. A member of each family was nominated “technical assistant” in order that videotapes could be changed daily. As the location of cameras was determined by members’ intimate “insider” knowledge of the setting, then so too, in their capacity as technical assistants, members’ decided on appropriate times for scheduling recording. The family member responsible for these technical arrangements also ensured that VCRs were operating properly, and that the recordings were of reasonable audio and visual quality. In addition to these activities, each household took part in individual and family wide interviews and viewings to explore ambiguities in the recordings and foster our understanding of their daily activities. Thus, in situations where the meaning of domestic activities was unclear, clarity was established through collaborative examination of the video materials in question.

The volunteer families came from a range of socio-economic brackets, although neither exceptionally poor nor wealthy families were included in the study (as none volunteered). The result of the “video ethnography” resulted in the capture of some 6000 hours of household activity, which is free from intrusion and bias to a remarkable degree. All but one of the families conducted their affairs without undue concern as to the presence of the video, being concerned to get their activities done rather than worry about what was going onto the video. In practical day-to-day details of “getting activities done”, video ethnography furnishes investigators with fine-grained and phenomenally intact \textit{in vivo} recordings of everyday family life. Incorporating the use of state of the art digital cameras and video recording techniques, new electronic devices allow the researcher to make a break with traditional ethnographic procedures, which rely on participant observation techniques that are often charged with introducing bias into the study of naturally occurring
interaction. In contrast to a mass of notes, anecdotes, vignettes, and disembodied conversations, video footage becomes the primary resource enabling direct investigation of the domain. Importantly, and in the manner of Sacks’ concern with audio recordings, video has the virtue that it is a “good enough” record of what actually happens in the home (and elsewhere), it can be replayed and so it can be studied in an extended way over a period of time, and others can look at what the researcher studies and make of it what they will should they disagree with the findings. Thus, not only can the researcher inspect the domestic environment in interactional details of actual lived events, anyone else can go and see whether what is said about those events by the analyst is actually so, and that, as Sacks reminds us, “is a tremendous control on seeing whether one is learning anything”.

The approach we take to “learning anything” or extricating findings from the video footage is descriptive rather than theoretical in character. Specifically, we seek to furnish “thick descriptions” of the actual interactional events that have been recorded. Thick description stands in contrast to “thin description”, signifying the difference between mere behavioural accounts that describe only what can literally be seen and those characteristics which identify the action as the action it recognizably is for members. As Ryle puts it,

[the] thinnest description of what the person is doing, e.g. pencilling a line or dot on paper … requires a thickening, often a multiple thickening, of a perfectly specific kind before it amounts to an account of what the person is trying to accomplish, e.g. design a new rigging for a yacht.

In order to get beyond the thinnest level of description of what members’ are doing (e.g. pencilling a line or dot on paper) we are obliged to thicken the thin features captured on tape (audio and video alike) and we may do this by attending to and describing the “accomplishment levels” whereby the action in question comes to assume its meaningful character in situ as just this or that action (e.g. designing a new rigging for a yacht).

The prima facie accomplishment level made available by audio or videotape is 1) a grossly observable layer of conversational formulations. This constitutes the starting point for thick description of the actions that are occurring on the tape. The analyst’s

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first task is to describe those conversational formulations as they are hearably produced and recognized by parties to the talk (as questions, answers, objections, challenges, agreements, and the rest). While special methods of description may be employed (Jefferson 1978; Jordan and Henderson 1995) they are not required as “there is no room in the world for formulations as serious solutions to the problem of social order” (Garfinkel and Sacks 1970), which is to say that formulations do not in themselves make available the craftful ways in which members’ organize their actions so that they assume the recognizable and sensible character that they do (as actions clearly implicated in designing a new rigging for a yacht, for example, in contrast to designing a home).71 In order to do that, the analyst need attend to a second accomplishment level and describe 2) the work performed by members’ formulations, a feature of naturally occurring interaction that is often partially eclipsed through the use of specialised methods of description, which focus on the way in which members’ organize their formulations through various “turn-taking” mechanisms at the expense of the work done by members through taking-turns (Lynch 1993; Garfinkel 2001).72 In the case of committal hearings we have seen, for example, the work accomplished through members’ formulations: work of making a case for non-voluntary hospitalisation, countering the case, and making a plea. Describing the work performed through members’ formulations makes available for description a third accomplishment level which consists of 3) the reoccurring courses of practical action or the work-practices whereby members’ organize their actions so that they assume the recognizable, meaningful character that they do. A fourth and final accomplishment level is made available by members’ work-practices which is the primary object of this particular research, namely 4) the patterns of relationships that obtain between actions and domestic technology as constituted in the recurrent courses of action through which members’ organize their actions so that they assume


the recognizable, meaningful character that they do: as actions implicated in “getting ready for work”, “taking the kids to school”, “watching TV”, and the rest.

The notion of thick description of accomplishment levels is not to be taken as a claim to have furnished a complete and exhaustive description of all the factors involved in the social organization of domestic environments and technological usages. As Ryle reminds us, “there is no top step on the stairway of accomplishment levels”, hence there is a possibility to extend any description, infinitely. For purposes of our research, we believe that description of the four orders of accomplishment level we have outlined above are practically adequate however, as they serve to make visible just how and with just what material technologies domestic activities are “put together”, constructed, and otherwise organized in the real world, real time actions of members. Thick description of these accomplishment levels are adequate, then, as they make available for consideration in design the “missing interactional what” of organizational studies and with that, the patterns of technology usage that actually obtain in the home.

It should also be said that the notion of thick description articulated here contrasts with the popular misreading of Ryle’s work offered by Clifford Geertz. Geertz suggests that attention to the fine-grained or “microscopic” details of everyday life presents a major methodological problem for ethnographic inquiry in the effort to move “from local truths to general visions”. According to Geertz, it is nonsense to say that

localized, microscopic studies [are] really dependent for their greater relevance upon such a premise – that they capture the great world in the little

Geertz’s solution to the problem of generalization is to substitute the local and microscopic for a grand theory that seeks to “inscribe generic conceptual structures of signification” upon everyday settings. Seeking to emulate the natural sciences, Geertz is concerned to identify universal generalizations that obtain across cultures or societies. Not being unduly concerned to emulate the natural sciences, insofar as they deal with entirely different objects to the social sciences that require different methods

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of study, we prefer instead to adopt Alexander’s notion of generalization, which generalizes patterns within specific cultural contexts. Any claims to generality are, then, firstly made across a single culture (British culture in this case). Furthermore, and secondly, as Alexander points out, the kind of patterns with which we are concerned obtain between particular social situations and the particular material-technological arrangements to which those situations are tied in and through action. Gross generalities of the type that Geertz, and the social sciences in general pursue, are eschewed then. What is generalizable are the particular patterns that obtain within the particular domestic situations that “make up” home life in recognizable detail within a particular cultural context. We assume that it can be the same for other researchers working in different cultural contexts and the possibility exists, that given such research, commonalities may be found. Whether common patterns exist or not will be an outcome of empirical research from the ground up, however, not of theorising the issue from the top down.

Cultural and cross-cultural research goals might be achieved by attending to the molecular sequences of interaction recorded on videotape. In real world, real time detail these sequences display the actions whereby members construct their daily routines and coordinate their activities in and across the various sub-environments that comprise the home, and which “latch together” in temporal order to compose the domestic environment as a common-place whole. The routine character of the sequences of interaction captured on tape display and preserve the natural history of domestic life and make that legacy available to design in terms of generic empirical patterns of action and technology usage. The analytical task is to describe these sequences in details of the accomplishment levels outlined above. It is towards the task of explicating empirical patterns that we turn our attention in the next deliverable (Equator D1.3 Patterns of Technology Usage in the Home).

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