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Apart from technology: understanding people's non-use of information and communication technologies in everyday life

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Abstract

Despite the high-profile nature of the current 'digital divide' debate, academic understanding of who is making little or no use of information and communication technologies (ICTs) remains weak. Indeed much of the discussion surrounding the digital divide has concentrated on the characteristics of those individuals who *are* using ICTs or, at best, simply pathologised the 'have nots' in terms of individual deficits. Yet developing a systematic and objective understanding of individuals' non-use of new technologies constitutes a major challenge for those seeking to map and understand the social realities of the 'information age'. The present paper, therefore, aims to develop a deeper conceptual understanding of people's non-use of new technologies: firstly, by considering established discourses of why individuals may be excluded or peripheral to ICT use; and then, via a critique of these positions, proposing an alternative framework of why people may not use ICT in their day-to-day lives based around individuals' 'reading' of technology.

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1. Introduction

The ability to use information and communications technology (ICT) is now assumed by most commentators to be a prerequisite to living and working in the

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‘information society’. Received wisdom has it that ICT is transforming all aspects of society—from education to civic involvement, employment to leisure. As the UK government has been prone to proclaim, using information technology is nothing less than “the indispensable grammar of modern life” [1]. This civic and societal imperative has given rise to prevailing political efforts within (over)developed countries to ensure that every citizen has a basic level of ‘universal access’ to information technologies and that disparities are reduced between those segments of society which are making use of ICT and those segments which are not. Indeed, there has been a burgeoning body of academic research over the past 10 years pointing towards the growing emergence of an ‘information apartheid’ [2] and a ‘digital divide’ [3]; popularly seen as occurring between technological ‘haves’ and ‘have-nots’ [4] or the ‘information rich’ and ‘information poor’ [5–7].

This contemporary recasting of the notion of a ‘knowledge gap’ fuelled by mass media [8] has prompted governments around the world to implement multi-billion dollar initiatives to counter these new inequalities of the ‘information age’. Yet, whilst the notion of the ‘digital divide’ has proved a “usefully alliterative slogan whose pan-political ambiguity lends rhetorical capital to whomever chooses it” [9], it remains a conceptually weak basis for researchers striving to develop a deep understanding of technology and society. As Webster [10] reasons:

to distinguish between the ‘information rich’ and ‘information poor’ both avoids precise delineation of who these are and fails to consider the range of different positions ... In short the model lacks sufficient sociological sophistication.

In particular, academic understanding of who is making *less* (or even *no*) use of information technologies remains weak. This paper therefore starts from an emerging consensus within the sociology of technology [11–13] that conceptualising non-users of technology as purely those who ‘have not’ any access to any technology is too crude an analysis. Recent developments in public and community provision of ICTs means that all but the most peripheral members of a society will have *theoretical* access to some forms of technology [13]. Yet, whilst the formal provision of ICT facilities in community sites such as colleges, libraries and museums means that all individuals living locally have potential physical access to new technologies, such ‘access’ is meaningless unless people actually feel able to make use of such opportunities. The logic of this argument can be seen in the increasing numbers of public payphones in UK towns and cities that have been recently converted to offer e-mail facilities alongside conventional telephony. Despite this formal provision it would be a nonsense to claim that every individual living in and around these towns now has effective and meaningful access to e-mail or, indeed, equitable access to e-mail when compared to individuals who use e-mail from their home or place of work. It is therefore important to acknowledge the importance of an individual’s ‘perceived’ (or effective) access in practice over the theoretical (or formal) access to ICT [14]. Any realistic notion of ‘access’ to ICT must therefore first be defined from the individual’s perspective.

Moreover, as Toulouse [12] observes, there are distinct types of access to tech-

nology; whether people have access at all and the hierarchy of access amongst those that do. Kanter's [15] broader view of an informational divide between 'cosmopolitans' and 'localists' reinforces this scenario, arguing that the 'three Cs' of competence, concepts and connections will underpin an ability to thrive in the global economy—with a relatively excluded class of localists curtailed by their embeddedness at fixed sites, "connections limited to a small circle in the neighbourhood and opportunities confined to their own communities" [15]. This theme has most recently been extended by Murdock [11] who argues for the identification of three groups of 'core', 'peripheral' and 'excluded' users (see Table 1).

Although these examples could still be argued to be overly simplistic, they do provide a useful starting point in framing the areas of interest for the current paper. Thus in recognising the hierarchical nature of ICT access and use as well as the importance of context and outcome of use we should identify both 'peripheral' and totally 'excluded' users as being 'apart from technology' and therefore worthy of further consideration.

Much of the debate surrounding the digital divide has concentrated on the characteristics of those individuals who *are* using ICTs or, as we shall discuss below, simply pathologised the 'have nots' in terms of individual deficits. Yet as has been recognised by previous authors, developing a systematic and objective understanding of individuals' non-use of information technology constitutes a major challenge for those seeking to map and understand the social realities of the 'information age':

A systematic understanding of the dynamics of digital participation is not presently available. This is due to the immaturity of research on access questions and to the inadequacy of frameworks for measuring these dynamics [16].

Who are the people that resist a particular technology or new technology in general; how do they differ from other social groups; how large is this group, and where are they located within the structures of society? [17].

As yet, these questions have remained on the periphery of academic work on technology and society. Despite the endless futurology, pundit supposition and market research forecasting that surrounds information and communications technology we still know little about the patterns of non-uptake and non-use of new technologies. Are non-users, as is widely assumed, falling into existing and deep-rooted patterns

Table 1
Levels of ICT access and use (from Murdock [11])

'Core' users	Continuous and comprehensive use of ICT for information seeking, communication and origination/production of materials
'Peripheral' users	Spasmodic and limited use of ICT for information seeking, communication and origination/production of materials
'Excluded' users	Non existent use of ICT for information seeking, communication and origination/production of materials

of social and economic inequalities? What are the individual motivations and consequences of *not* using ICT in our supposed information society? With these questions in mind the present paper aims to develop a deeper conceptual understanding of people's non-use of new technologies: firstly, by considering established discourses of why individuals may be excluded or peripheral to ICT use; and then proposing an alternative framework of why different groups of people do not use ICT in their day-to-day lives.

2. Established discourses of excluded and peripheral users of technology

Before constructing our own framework of non-use of technology it is worth first considering existing explanations of non-users of technology that have become established over the last 20 years.

2.1. *Discourses of material and cognitive deficiency*

It is agreed by many authors that the most immediate influences on individuals' engagement with ICT are economic and material. On a day-to-day basis the economics of using ICT is a crucial and on-going mediating factor, with some commentators seeing the digital divide primarily in terms of people "tak[ing] individual responsibility for the economics of getting on-line" [18]. As Murdock et al. [19] argue, material resources and economic capacity play a central role in determining (i) whether people use ICTs and then (ii) the nature and subsequent patterns of that use—citing the example of the difficulties of using a word-processor without a printer or adequate monitor.

The economics of gaining access are, therefore, an obvious prohibitive factor to using ICT. The high cost coupled with a high technological 'churn' (i.e. constantly increasing specification) make many forms of ICT an uneconomic prospect for some people. Of course, for some technologists this economic argument "does not bear scrutiny" as "digital devices are not very expensive [nor] particularly costly when they are compared to other contemporary lifestyle items like music and hi-fidelity equipment or even mountain bicycles" [16]. The influential educational technologist Stephen Heppell [20] also reiterates the notion that the economics of using ICT are not an issue: "there is a much more egalitarian spread of computers at home than there ever was of encyclopaedias. We find more of a correlation with satellite dishes and there isn't the socio-economic skewing one might have expected".

Yet using technology, for most people, is a costly business. As Kling [21] observes, the total costs of ownership (TCO) of technologies such as computers has been shown to be a fraction of initial equipment costs—with training, upgrading and reconfiguration proving to be the major costs over time. Indeed, it has been estimated that the cost of purchasing a personal computer and relevant software is only 16 percent of the total cost of running a system. Thus, to disregard the economics of using ICT is, of course, to grossly underestimate the economic poverty that large segments of society are living in. A host of studies and official reports have high-

lighted income and socio-economic status as key underlying factors behind people's engagement with ICT. Bucy's [22] secondary data analysis of two state-wide surveys in the USA suggested that income continues to be an important social determinant of on-line access and that Internet use is lowest among members of lower socio-economic groups.

Whilst material resources are important factors many academics acknowledge that the difference between using and not using ICT is not merely a case of a simple 'equipment gap' [23]. As highlighted in the psychological and human–computer interaction literature there are also a range of individual factors centring around the cognitive and intellectual ability to use technology which are another set of enabling or disabling factors. Having the requisite skills and knowledge to use a technology are obvious factors—underpinned by an individual's experience of, and attitudes towards, using technologies.

Although not always conclusive [24,25], academic research has regularly highlighted a link between experience of using a new technology and attitudes towards it. Loyd et al. [26], for example, found a strong correlation between computer experience and affective attitudes towards computers, while other studies have also found a similar significant relationship between experience and both cognitive and affective attitudes [27,28]. From an intuitive point of view the link between technological experience and technological disposition would seem obvious, as the more a behaviour is performed the more that attitudes about it can be formed and reinforced. Todman and Monaghan [29] suggest that individuals' initial experiences with computers, if favourable, tend to result in more positive affective attitudes. This effect was demonstrated by Miller [30] who showed that primary school children's general attitude towards computers was significantly improved with only seven hours of tuition with the LOGO programming language.

Psychologists therefore point towards a range of cognitive and affective factors as important in determining an individuals' engagement with technology—such as perceived ease of use, self-efficacy, perceived behavioural control and perceived ability [31–33]. The complexity of the relationship between causal factors and attitudes is highlighted by the numerous other psycho-social factors that have also been found to correlate strongly with attitudes towards computers. The link between attitudes towards mathematical ability and attitudes towards computers has been explored by many studies [28,34,35]. Other studies have also revealed that peoples' creativity level, learning and social self-image and locus of control all significantly correlate their computer-related attitudes [36,37].

2.2. *Technophobia*

Following on from these general cognitive factors a distinct body of psychological work has emerged looking at individuals who make little or no use of technology. Constructs such as 'computerphobia', 'computer fear' and 'technophobia' now provide established accounts of individuals' reticence to use computers and other information technologies. Although exact definitions vary, the phenomenon of 'technophobia' is considered by social psychologists to encompass the fear and apprehension

felt by an individual when considering the implications of using technology, even when it poses no real or immediate threat. In other words, technophobia clouds an individual's perception of the technology in question, making it appear somehow 'not for them'.

The vast majority of research has concentrated on the phenomenon of a 'phobia' or anxiety causing people to avoid using ICT in settings such as the workplace, school or home [38,39]. Thus individuals' technological 'reticence' [40] has become framed in terms of an almost irrational fear and stress brought on either by a lack of experience or a seemingly deep-rooted adverse reaction to the threat that ICT poses to the user [41]. Such explanations are almost always based on the assumption that an individual's aversion to using computers is transitory and somehow 'treatable' [42].

Early studies in the 1980s estimated that 30–35 percent of all users experienced some degree of anxiety when they first used a computer. At the time some authors argued that technophobia differed little from the anxieties which have surrounded the introduction of other technologies throughout history—and that anxieties about using ICT would inevitably diminish as computers become more commonplace. Yet, two decades on, research suggests that technophobia remains just as relevant. For example, recent studies indicate that technological anxiety continues to correlate significantly with individuals' characteristics, most notably gender and age as well as more obtuse characteristics such as 'left-orientated parts of the population' [18].

2.3. *Ideological refusal*

A third popular explanation of non-use of ICT focuses on people's supposed misconception of the enhancing nature of technology. No technology has achieved *absolute* permeation within the adult population, with 'universal' technologies such as the television and telephone only having coverage of between 90 and 98 percent of the population. This has led some commentators to contend that in the long term, the only people not using ICTs will be 'information *want nots*'—refusniks who for ideological reasons choose not to engage with ICT despite being able to in practice [43]. This non-conformist thesis portrays non-use of technology as an act of opposition against technology—usually by those who can afford to do so:

The resistance against information technology is mostly local and a matter of 'intellectuals'; it is mainly informal, individual and passive, such as a refusal to work with computers [18].

As this quotation intimates, technological refusniks are portrayed in an ideological light; resisting ICT in terms of implications for traditional patterns of work and life. Refusnik behaviour is also rationalised in more esoteric terms—especially with regard to aesthetics and humanist concerns. Sherry Turkle [44,45], for example, points to some people's rejection of the 'anti-sensual' culture of computing and the linear, logical and reductionist nature of the 'modernist computational aesthetic'. Other authors have pointed to the aesthetic paucity of the on-line experience as

opposed the offline ‘real world’ [46] and the restriction of the expression of self within the confines of the structure of their programming [47]. This humanist thesis is typified by Norman [48] who points to the clash between the ‘hard’ nature of machines and the ‘soft’ nature of the humans that are expected to use them. As Norman argues, the things that people are good at are the things natural to human kind, such as creativity, invention, empathy, and emotion. People adhering to these views and subsequently avoiding use of ICT are therefore deliberate non-users of technology.

2.4. *Diffusion theory*

Finally, one of the most influential explanations of people’s adoption of innovations can be found in the ‘diffusion’ literature [49–51]. Diffusion theorists point to a recurring ‘s-curve’ of expansion of technology use in society from initial groups of ‘early adopters’ through to the majority of the population at a later date. Such writers have identified a succession of phases in the diffusion of innovations throughout the twentieth century—pointing to an ‘inevitable’ progression from ‘innovators’ to those individuals who are ‘early adopters’, through to the ‘early majority’, the ‘late majority’ and eventually those individuals who are ‘laggards’ [49]. This model of progressive take-up of technology has proved especially popular in marketing and commercial settings leading to a variety of derivations; such as Mendoza’s [52] ‘skaters’, ‘striders’, ‘sprinters’, ‘strollers’ and ‘starters’.

According to diffusion theorists, societal use of an innovation is hastened by its relative advantage—i.e. “the degree to which an innovation is perceived as providing greater benefits than the previous idea that it replaces” [49]. From this perspective, new ICTs such as the Internet are seen to have a high degree of relative advantage, as Rogers [53] continues:

Compared to postal mail, email via the internet is faster, cheaper and quicker. Compared to books or other sources of information, the World Wide Web is a more convenient means of searching for information (that is, if an individual has access to a computer and modem).

This ‘natural’ diffusion (or ‘trickle down’) thesis can be seen as an elaboration of a technological determinist viewpoint that access to ICT inevitably leads to use. From a diffusion model perspective, non-users of technology are merely seen as ‘laggards’ [54,55] or even ‘defectors’ [56]. This somewhat negative positioning derives from the assumption that non-use and/or non-acceptance is an impediment to an innovation’s saturation in society. From the diffusion perspective, a ‘critical mass’ of users is needed for the permeation of an innovation to accelerate [50,57,58]. Thus, if individuals discontinue their use of an innovation this weakens the critical mass and eventually prompts an accelerated rate of defection [58]. Diffusion theorists therefore see non-participants primarily in terms of reducing the potential marketplace for ICTs—referred to as a problem of ‘discontinuance’:

The significance of the defections is that they slow the growth of the Internet community and hence limit the size of the electronic marketplace ... At some point it is possible that, in the developed countries, the majority of those not connected to cyberspace will consist of those who have been there and were not impressed enough to stay. This tends to lower the ceiling of the Internet sector of the electronic marketplace, unless the unimpressed can be won back [56].

3. Recognising the weaknesses of existing accounts

If we are to consider these existing accounts it is clear that most existing explanations of non-use of technology are based upon a number of widely held assumptions. Firstly ICT use is assumed to be an inherently desirable and beneficial activity for all individuals. Of course, as Lievrouw [59] argues, the whole notion of the information society is based upon an ideological belief in the positive and socially integrating power of technology alongside a prevailing ethic of instrumental rationality and strategically practised self-interest towards accruing such benefits. The discourse of the information society has therefore been framed popularly in terms of individuals resorting to their 'own devices' both in the sense of personal agendas, strategies, interests and interpretations, as well as in the form of the technological tools that help realise them. From this perspective to *not* use ICT is to choose not to be part of the information society—an irrational and ultimately disadvantageous position to adopt.

We can see throughout all the conventional accounts previously discussed that it is therefore considered 'normal' to use ICT and, conversely, non-use of technology is considered an abnormality. Yet as Bauer [60] has observed, this conceptualisation of 'normal' is a narrowly defined one:

'Normal' is best seen to indicate a state of affairs that is conducive to well-being in a specific environment. Different environments result in different (ab)normalities; hence the assessment of norms is relative to a certain environment, biological, psychological and social. It is inadequate to claim that [techno]-phobia ... is a universal psychological problem. All it measures is a deviance from the Californian way of life and the part that computer (non-)interaction may play in it. The exposure to a computerised world may be so intense in California that otherwise normal reluctance appears 'abnormal'. Indonesians have a different way of experiencing and dealing with computers, but are not necessarily in need of special treatment, albeit that according to Californian standards they appear to be. This difference is an interesting result but we need not pathologise it.

From this 'abnormal' perspective it is a short step towards the shared assumption that non-use of ICT is due to a deficit on the part of the individual concerned. The four discourses of economic and cognitive deficiency, technophobia, ideological refusal and diffusion are all fashioned around a deficit model where non-use of tech-

nology is due to shortfalls in cognition, personality, knowledge, resourcing, social situation or personal ideology.

Thus, to date, most academics have focused on non-use of ICT as a ‘problem’ which should be ‘solved’. As Bauer [61] observes, there has been a tendency for commentators to revert to a quasi-pathological model when describing people’s non-use of new technologies—presenting the ‘problem’ through the ‘clinical eye’ and in a profoundly negative manner. Moreover, this prevailing pathological approach denotes that the problem of non-use of technology has relatively straightforward therapeutic or technical solutions at the level of the individual. Similarly, from both a commercial and political perspective, diffusion theory is appealing in as much as it suggests that universal adoption of a technology will result from increasing public skills and knowledge about technologies and providing the most disadvantaged with public access. As we shall now go on to explore, viewing non-use of technology in terms of a deficit framework denies the individual any rational choice and free-will. Indeed, as Bruland [62] argues, we must consider the possibility that not using certain technologies for some individuals is a more nuanced matter: “[Non-use] could thus be seen as a positive part of a social selection process, not an obstacle to the inevitable march of technological progress”.

4. Re-considering the factors influencing individuals’ ‘non use’ of technology

It is at this point that we should recognise the need for a reconceptualisation of people’s non-use of technology if we are to develop a deep, objective understanding of why people do not engage with ICT in society. First and foremost it is essential to avoid an assumption about the ‘benefits’ of technology for individuals and, it follows, preclude the formation of a pejorative approach towards non-use of technology. It would also appear prudent to resist mono-causal explanations and focus on individual as well as collective influences. Indeed, what is missing from many existing accounts of non-use of ICT is a focus on the individual and granting to the individual of a degree of agency in their non-use of ICT.

From this perspective we approach non-use of ICT primarily in terms of understanding the information needs of the individual rather than the perceived information needs of society. This involves accepting that people are more than simply ‘end users’ with no role to play in the technological process beyond accepting ready-made technological artefacts, but exploring the processes underlying how technologies are consumed and used. Crucially, as Chatman [63] observes, any understanding of why an individual is not making use of ICT should start from a bottom-up perspective:

As a profession, [information/technology academics] are only beginning to serve the needs of other populations. The process of understanding begins with research that *looks* at their social environment and that *defines* information from *their* perspective (emphasis in original).

With this in mind it is perplexing how most authors have failed to acknowledge the

fundamental importance of the relevance and utility of using ICT to individual's life and situation as under-pinning non-use of ICT. At a basic level of definition technology is medium of human action—facilitating (and sometimes constraining) human actions [64]; in short helping humans to do things. Using technology can therefore be seen as “human agents appropriat[ing] technology by assigning shared meanings to it, which influence their appropriation of the interpretative schemes, facilities and norms designed into the technology, thus allowing those elements to influence their task execution” [64]. Although the ‘user’ needs to be able to exert a degree of control and choice over the technology and its content—it is the meaning, significance and utility of the potential technology use which is the crucial underlying factor for the individual concerned [65].

A concept which can be applied here from diffusion literature is that of ‘relative advantage’ [66]—i.e. an individual's perception of whether adopting an innovation is worthwhile or not in terms of economic and/or personal cost. In a similar vein Wilson [67] proposes the importance of ‘situational relevance’—i.e. the applicability of a course of action to individual concerns or interests. Another cognate concept is that of ‘sense’—with only things that make sense to an individual in terms of their lived experience or lifeworld then being able to be seen as relevant and useful:

An application of relevance in an everyday context therefore means that which will be of interest is that which is useful in response to some concern or problem. Moreover, understanding the concept of relevance provides insight as to why potentially helpful sources might be ignored: because people who are experiencing a precarious existence do not see a generalised view of many sources provided by outsiders intended to respond to their situation. Even if a source is perceived as potentially useful, it will not do much good to the individual if that source is not legitimised by contextual others [63].

Thus, as Balnaves and Caputi [68] reason, it therefore follows that where the impact, meaning and consequences of ICT use are limited for individuals then we cannot expect sustained levels of engagement:

The concept of the information age, predicated upon technology and the media, deals with the transformation of society. However, without improvements in quality of life there would seem to be little point in adopting online multimedia services.

In particular, this notion of meaning can be seen as being at the heart of whether an individual makes use or does not make use of ICT. For example, Balnaves and Caputi [68] point towards understanding the *relevance* of access to technology and information from the point of view of the individual, and, in particular, the relevance of the consequences or potential consequences of engagement with ICT for people. On the one hand relevance can refer to activities which are merely ‘fun’ and pleasurable. But, on the other hand, the consequences of engaging meaningfully with ICT can also be seen in terms of the effect on individuals’ ‘social quality’—i.e. socio-

economic security, social inclusion, social cohesion and empowerment [69,70]. Thus the impact of ICTs could be seen in terms which reflect the extent to which technology use enables individuals to *participate* and be part of society, i.e. the extent to which “ICTs enhance our abilities to fulfil active roles in society, or being without them constitute[s] a barrier to that end” [71]. It follows that the already strong or weak across all these domains have less compunction to be using ICT. If one of the perceived benefits of using ICT is to ‘increase a sense of community’, ‘trust’ and ‘interaction’ between people—why would people already established and ‘strong’ in these areas necessarily turn to ICT over and above their already successful sources of community and interaction? Similarly, those who are lacking in the life-domains outlined above are likely to be lacking for a variety of deep rooted social reasons—which will persist even if opportunities now exist via ICT.

Before this argument appears to be overtly individually determined it is important to stress that this ‘making sense’ of technology is obviously structured. Indeed, Neice [16] argues that for many people ICT use is heavily mediated by the institutional contexts in which they find themselves in. He describes ‘institutional mediation’ of technology in terms of “the extent to which [ICT] access is reinforced for some individuals, groups and social strata by institutionally enriched and supportive contexts” [16]. This is especially important in terms of the ‘technical intermediation’ of institutions such as the workplace, the school and the home as well as the wider political-economic intermediation of governments and IT companies. For many people there are, therefore, key institutional conditions of interacting with technology:

In many organisations individuals may have little control over when or how to use technology, and hence little discretion over which meanings and elements influence their interaction with it [64].

Those who are operating in places where [ICT] access is an important functional element are likely to benefit from the skills and training which are available and that are in turn reinforced by institutional intermediation. Similarly, the physical qualities of institutional connections, e.g. bandwidth, speeds of connectivity links ... are likely to be superior in contexts where institutional intermediation prevails [16].

It is therefore possible to extend Silverstone et al.’s notion of the domestication of technology within the ‘moral economy’ of institutions such as the household [72]. Authors such as Silverstone, Haddon and Hirsch have shown how the roles and meanings that people give ICTs are shaped by the way that they organise their lives. A key stage in the domestication process is the *appropriation* of technology by the consumer—where the individual attempts to objectify the technology (i.e. give it a physical, symbolic and social place) and incorporate into the everyday life of the household. Silverstone therefore describes how people go through an ongoing series of conflicts, negotiations and compromises over the location, ownership and control of technologies—as the technology is ‘placed’ or ‘positioned’ into the already exist-

ing set of rules, routines and ways of doing things. Although the concept of domestication was initially suggested with regard to the household and family it can be extended to other institutional contexts such as the school or workplace [16] and an argument can be made to extend the metaphor further into the level of the individual user. Indeed, with mobile ICTs increasingly less ‘fixed’ to the confines of institutions (be it fixed in terms of physical connection to power supplies and network connections or fixed in terms of ownership) it can be argued that technologies go through a process of domestication into the ‘moral economies’ of people’s lives as well as across all the institutional settings that they are brought into. Therefore each individual will be constantly negotiating the ‘proper placement of technology’ into their lives according to a range of personal and institutional factors.

5. Towards a multi-layered model of non-use of ICT

Suggesting that people’s non-use of technologies is a complex, fluid and ambiguous issue guided by ‘goodness-of-fit’ with their lives may appear common-sensical—but is at odds with the bulk of technological thinking over the past 20 years. This paper has attempted to argue that use or non-use of technology moves far beyond the conventional determinist standpoints of the individual either solely acquiescing to the technological imperative or solely taking strategic choices. Instead we should recognise that technology has a duality in that although it is the product of human action and agency it also assumes structural properties [64]. Thus individuals’ non-use of technology is enabled and constrained by structures which themselves are the result of previous agency. In identifying the factors underlying individuals’ non-use of technology we need to recognise both these structures and agency. As Orlikowski [64] observes, developing an understanding of agency in the use of ICT has, until recently, eluded many studies: “[utilisation] researchers are less inclined to focus on the human agency that initially produced the technology, and tend not to recognise the ongoing social and physical construction of technology that occurs during its use”. Moreover, “human agency is always needed to use technology and this implies the possibility of ‘choosing to act otherwise’” [64].

This paper has therefore highlighted a need to move away from explanations which are rooted in a determinist perspective where ICT use is seen as inherently beneficial and technology ‘rejecters’ are, therefore, deficient for not subscribing to the inevitable ‘information revolution’ and focus on the contested nature of technology. As Heller [73] argues, at best, technology offers a number of ‘options’, or ‘choices based on particular contingencies’, which determine the variable impact of technology on people. Thus individuals’ interactions with ICT are not as simple as the ‘user’/‘non-user’ dichotomy constructed by much of the previous literature. As Rolfe contests, “research should not attempt mono-causal or simplistic explanations for responses to [technological] change but uncover and assess the relative importance of the many, often conflicting, influences” [74]. Thus, as Facer and Furlong [75] reasonably point out, at the heart of the non-user debate is the notion of choice. Whilst some individuals are able to actively choose not to use ICT others have little choice whether they

make use of ICT or not. This tension between structure and agency, of course, lies at the heart of most contemporary sociological debates [76]. It is clear, therefore, that an individual's non-use of technology is bounded by their access to the 'opportunity structure' of ICT—as it is to the moral economies of the institutions in which potential access exists.

It is therefore possible to adopt an alternative, anti-essentialist view of individuals' non-engagement with ICT. From this perspective, technology has no essential properties. For example, ICT is not inherently beneficial and non-users are not automatically at fault for avoiding use. Instead, technology can be seen as text; a notion which intimates that the nature and capacity of technology is, in principle, interpretively flexible throughout all stages of development and use [77,78]. As Woolgar reasons:

This version of 'taking social dimensions into account' offers the opportunity for giving a new focus to analyses of the problem of the user. When construed as a text, technology is to be understood as a manufactured entity, designed and produced within a particular social and organisational context. Significantly, this is often done with particular readers in mind—it is fabricated with the intention that it should be used in particular ways. On the consumption side, the technology is taken up and used in contexts other than, and broadly separate from, its production [79].

Thus applying this metaphor of 'technology as text' thereby "sets the frame for an examination of the processes of construction (writing) and use (reading) of the machine, the relation between readers and writers is understood as what it is for and what it can do" [80].

We can see from this perspective that individuals 'read' ICTs from a variety of perspectives bounded by a number of structural factors. Of course, the reasons underlying individuals' non-use of ICT can often be tacit, clandestine, unconscious or parochial in motive [60]. Some underlying factors may be within the capacity of the individual to change and other underlying social and economic forces will fall beyond individual intent [81]. For some people non-use of ICT is primarily bound up with structural circumstances which prevent them from otherwise making use of ICTs which are relevant and useful to their lives. In other cases, non-use of ICT could be seen as a 'tactic of resistance', described by de Certeau [82] as an ordinary practice that enables disenfranchised and oppressed people to realise their variety of voices, maintain communities, and achieve practical kinds of power. Not using ICT is one way that individuals can assert some control over their lives—in the same way that for some people there is a symbolic value to using ICT [76].

It is also important to acknowledge that people can move between not using ICT and using ICT throughout their lifetime—and also that use and non-use of ICT will vary from technology to technology. One could be a regular user of a mobile phone yet never use the Internet or a personal-computer for example. Murdock [11] points towards the notion of a technological 'career'—emphasising the changing nature of people's relationships with and use of technology. As Kingsley and Anderson argue

this change can work in both directions, with users deciding to cease using ICT as well as non-users being ‘converted’ into users:

Enthusiasts may like to think that once a person encounters the Internet, he or she will be launched on a life long love affair. Once experienced, Internet access is something the user will never want to be without. There is, however, growing evidence of a large body of ex-Internet users who have decided they can forego the pleasures of cyberspace [56].

Above all, commentators on technology and society should avoid the temptation to assume that technology is always (a) available and (b) a ‘good’ thing. For many authors, the imperative is towards “giving people the information tools they need to participate in the decision-making structures which affect their daily lives. It means helping people use these resources to deal with their everyday problems” [83]. But for some people ‘dealing with everyday problems’ does not and will not involve personal use of ICT. There is a danger that academic researchers and technologies operate in a wish-fulfilment ‘information society’ that does not exist beyond their rarefied, technology-rich work and domestic environments. Middle class commentators often forget the fact that technology is not as societally ubiquitous as it may be in their lives. As these two studies of how low-income urban families and rural school children engage with ICT both concluded:

It is clear that computerisation, telecommunications and mass media applications are dramatically under-represented in distressed urban areas. This especially true in areas where personal computers are a rarity. In middle class communities, residents are accustomed to seeing lasers scan their supermarket purchases and watching the output appear on a LCD screen. There are no supermarkets in most low-income, inner-city neighbourhoods. In some predominantly black communities, only one in four households has a telephone line [84].

It is clear that computers do not have the high status attributed to them in the wider economic and social community. Far from being seen as the key to successful participation in the ‘real world’, many of these [low ICT using] children argued that computer use, quite simply, was not relevant to their day-to-day activities [75].

Understanding the economic, material and individual psychological factors behind non-use of ICT is not sufficient: “knowledge of the dynamics of everyday life is indispensable to understanding the processes of acceptance of ICTs” [85], however unpredictable, differentiated and sometimes irrational these everyday life experiences and practices may be. Thus, in focusing on non- and low-use of technologies we must begin to recognise the importance of the social. As Bruland concludes, resistance to technology is by no means irrational or conservative and “can really only be understood in terms of the interaction between the technology and its social context” [62]. Focussing on the social and technological non-placement of technologies into

people's everyday life should now form a central tenet of research into technology and society.

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