SWITCHING ON TO SWITCH OFF: A ANALYSIS OF ROUTINE TV WATCHNG HABITS AND THEIR IMPLCATIONS FOR ELECTRONIC PROGRAMME GUIDE DESIGN

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1. INTRODUCTION

The burgeoning technologies that are emerging from the convergence of broadcasting, telecommunications and computing promise significant changes. Devices such as interactive-TV and TV-on-demand promise to provide those in the home with unprecedented access to information and entertainment. They also raise the prospect of altering the relationships between home activities and those traditionally undertaken elsewhere - work, shopping and play.

Until now, however, relatively little has been published about television viewing and interactive-TV in the system design literature. The disciplines that focus on the interaction between people and technology have been primarily oriented towards studying work and particularly office-based activities. Where domestic activities such as play and entertainment have been considered, solutions have generally been driven by technological advances rather than an understanding of the interactions between people and technology in the domestic context. Such an approach does not tend to consider why people use technologies such as TV and the relevance the technology has in people's everyday lives (Norman, 1999).

To counter the lack of in-depth social research into TV viewing in the home, a small number of studies have sought to use qualitative field studies to explore the relationships between technologies and people's daily lives (e.g., Black, Bayley, Burns, Kuuluvaineng & Stoddard, 1994; Logan, Augaitis and Miller, 1995; Mateas, Salvador, Scholtz and Sorensen, 1996). Despite their use of these explorative techniques, however, these studies have usually aimed

to elicit user requirements for specific technologies rather than gain a general understanding of how TV plays a role in domestic life. Thus, although they provide a reasonable basis for designing usable television user interfaces, these studies fall short of explaining what it is about television watching itself that influences how viewers interact with televisions.

In light of the above shortcomings, the research we report here is specifically targeted at investigating what we call the natural rhythms of TV viewing. By this we refer to the common, ordered and patterned use of TV in the home – to the taken-for-granted practices of what has come to constitute TV viewing. This inquiry is oriented towards how an understanding of these practices might be used to inform design and specifically the design of systems for programme selection and storage.

1.1 METHOD

The presented research has drawn on three methods for collecting data: focus groups, household interviews and ethnographic fieldwork. These activities were undertaken in serial order, with the focus groups providing a basis for the household interviews, and both the focus groups and the household interviews providing a metric for determining what to seek in the in-depth ethnographic research.

In total, six focus groups were held in three different regions across the UK. The topics raised and discussed in the focus groups included: typical evening viewing; programme choice; video use; and future technologies. The household interviews comprised of visits to twenty families and investigated the ways people view TV; gain information about programming; navigate their way around their systems; select programmes; and use and store videos. Both the focus groups and interviews consisted of people from a range of age groups and socio-economic backgrounds. People were also selected based on their adoption of existing technologies; including: terrestrial TV; PCs/interactive technologies; multi-channel satellite/cable TV.

The aim of the ethnographic fieldwork was to provide rich qualitative descriptions of how people go about choosing programmes and watching television in the context of their own homes. Specifically, eight households took part in interviews and diary keeping exercises to learn why and how people watch TV, and how TV is seen to fit into daily life and commonplace, domestic activities.

2. FINDINGS

2.1 TV Viewing

From the results of the data collection, it was no surprise to discover that for the majority of people, the television was a near-permanent companion. Indeed, across all social-economic groups it was seen as a near constant companion.

> In my household there is no difference... when I'm there, the TV is on. Even when I'm working in the house (and there's) a lot of background noise, I need it to be on...even when I'm in the kitchen cooking or washing up.   (Female, under 45)

This use of the TV, however, says very little about what television watching entails as a social activity. What it does indicate is that television is not viewed as something that is special or unique, so much as a natural and common feature of the home. This is important as it suggests that TV is not to be thought of as something akin to, for example, watching a video: that is to say a event unto itself. Even though the TV is sometimes precisely for that, the ubiquity of the TV makes it distinct. TV is bound up with the ordinary, natural rhythms of daily life in the household; it is, as they say, part of the furniture.

Our findings reveal that the natural rhythm of TV viewing is itself made up of pieces, or periods. From the earliest focus group interviews through to the ethnography, it was found that viewers tend to establish regular patterns of viewing. We found this to be especially the case on weekdays, during the late afternoon and evening. Daytime and weekend viewing were far less structured and were highly dependent on such things as weather and the season. Concentrating on this patterned weekday viewing, we found that most households had three distinct periods of television viewing: the 'coming home' period; mid-evening viewing; and later-evening viewing.

2.1.1 Coming Home Viewing

Coming home viewing normally began after work or school in the afternoon or early evening. The TV was turned on to unwind, to start the process of relaxing or as a form of distraction, undertaken alongside other activities. For want of a maxim, this behaviour could be described as 'switching-on-to-switch-off". Generally it can be characterised as highly disengaged viewing.

> As soon as I get in the TV is turned on, and we're not necessarily watching it but the TV is just turned on. We might be...on the phone to somebody, or our friends are round, but the TV's still on. I can't say there's a time when the TV's not on to be honest. That's it really.   (Male, West Midlands, under 45)

People were also very tolerant of what they watched during this period. For the most part, programmes were chosen in a highly unplanned fashion by 'surfing' through the channels until something appealing was found.

> ...I will turn the television on and just flick through the channels when I come in, and probably keep it on and wander around doing whatever I've got to do.   (Female, West London, 45+)

The participants in our research claimed that their main method for selecting programmes during this period was to channel hop – switching or 'surfing' between the channels searching for something that appeared interesting or familiar. The focus was on choosing something to watch now or possibly next (the latter achieved by catching programme previews or announcements). Notably, people made little to no use of programming guides.

2.1.2 Mid-Evening Viewing

The next period, the mid-evening viewing, would often run through dinner, and would last until about 8.30 to 9pm. In contrast to coming home viewing, this period had an order, with the planned viewing of certain programmes and with higher levels of engagement. During this period, household members chose programmes that they regularly watched, like soaps, sports, game shows or the news. Content providers call this 'viewing by appointment'.

These programmes would often be viewed communally and would also dictate when and where other household activities, such as dinner and homework, took place.

> Actually, if there is something very good (on), and I...want to watch it, I prepare dinner earlier so that we finish by the time the programme is on.   (Female, West London, 45+)
>
> I've got a through lounge so I always make sure that my dinner is prepared just before EastEnders comes on.   (Female, South-east London, 45+)

During the mid-evening period, where levels of engagement varied, viewers relied on their knowledge of the programming schedules to choose what to watch. Specifically, they relied on their daily or weekly routines to help them remember what was on. This habitual time-based selection (Brown, Gardiner and Turner, 1999) generally involved viewers knowing that particular types of programmes were on at specific times. Occasionally, viewers would also make mental or physical notes of the programmes they wanted to watch, such as subsequent episodes of a documentary series or drama. Both these methods allowed them to turn directly to the desired channels without the need for programme guides. Only after regularly watched

programmes had finished, did people during this period make use of programming selection methods like channel surfing or reading through programme guides.

2.2.3 Later-Evening Viewing

The third period, later-evening viewing, would often take place once the day-to-day chores in the house were completed and last until 11.00 or 11.30pm. For example, several parents who participated in the research project said they would only sit down in front of the television and think about what they wanted to watch after they had finished dinner and put the children to bed.

This viewing tended to involve a relatively high degree of engagement in most households. People seemed to have specific types of programmes they wanted to watch after this later-evening 'watershed'. Documentaries, current affairs programmes and dramas were particularly popular. It was evident that household members would often have their own individual preferences at this time of the evening. It is worth noting that we found it common for households to have several sets—on average an amazing 4.1 in a survey of 5000 people we undertook—and that this tended to reduce or eliminate any arguments about what was watched.

During the later evening viewing people participating in the research tended to use programme guides more often. Predominately, viewers would use paper-based guides; however, the use of onscreen guides occurred occasionally. The guides would primarily be used for short-term planning. To select a programme, people would glance across the guide, looking specifically at shows that were currently being shown or on next. As well as the guides, people also channel surfed, particularly when they did not have immediate access to a guide.

2.2 Analyses of the three types of viewing

From this description of the three distinct viewing periods, it is apparent that people watch television in quite different ways. These are based on the degree of engagement and the extent to which viewing is planned. Levels of engagement vary between the three periods starting low, then becoming variable and peaking in the late evening.

Nonetheless, television viewing appears to be curiously "unplanned" Unplanned in the sense that though they might know what they are about to watch—say during the mid-evening viewing—they do not at any particular point settle down and plan that activity with reference to programme guides. There is nothing that one might call a rational decision making process.

Crucially, across all three viewing periods and apparent in the ordered sequence of methods was the aim people had to minimise the amount of effort needed to choose a channel. Those participating in the research indicated that they had 'thresholds' delimiting the effort they were willing to make to find and select programmes. In the research findings it was notable that these effort-thresholds varied depending on the contexts people were in. Viewers watching television in the early evening, for example, had relatively low thresholds because they were tired from work and simply wanted to relax and unwind. Later in the evening, they claimed they would be more critical about the programmes that were on and would be willing to exert more effort in choosing a programme. This variability on the effort made by TV viewers resulted in a range of programme selection methods, ranging from channel surfing to the use of the paper or electronic programme guides (EPG). The patterned and seemingly ordered use of these methods is discussed in detail below.

2.2.1 Programme Selection Methods

Throughout the data it was evident that viewers tended to use programme selection methods in a specific order (Fig. 1). Viewers began their search for a programme by channel surfing. If they failed to find anything using this method they searched—or waited—for a programme announcement to find out what was on next. If this second method did not achieve a result, or if the method was skipped, their knowledge of the weekly schedules or of upcoming programmes would be used. After attempting these three methods, the viewer would turn to either the paper-based or the onscreen guides. This order was not strongly fixed, and occasionally viewers would find themselves in situations where one or more of the methods were not appropriate.

Nonetheless, there seems to be a certain logic to these methods, reflecting in part the social context of viewing—when for example they come home and switch the telly on to 'switch off', as against switching on for viewing by appointment later on in the evening. At the same time these social contextual factors appear to be related to what one might call the cognitive load involved in using each type of method. For example, channel surfing was the first and most frequent method used because it was felt, by viewers, to be 'effortless' and require little thought. To understand why there was this perception of effortlessness, channel surfing must be considered in the context of television viewing. From such a perspective, channel surfing can be seen as part of viewing. It is inherently associated with the act of 'watching' television. When viewers turn the television on, they are immediately faced with a choice of channels and the act of watching necessarily involves navigating to the programme they wish see. The navigation, in this sense, is how they understand television to 'work': it is immediately 'at-

hand'. Through this understanding, they recognise that by moving (or surfing) through the channels they will see what is on. It could be said that channel surfing is afforded in the act of watching television.

Figure 1. The sequence of methods used to make programme selection

The other ways people select programmes require quite different interactional processes, each with increasing demands on the viewer. Although reading through a paper-based programme guide, for example, may not be taxing, it requires that the viewer step out of the act of watching television. In doing so, some of the affordances that were present in television watching are lost. Fortunately, reading and looking through information on paper is a familiar task for most people. Indeed, paper has been shown to have a number of properties that support reading and the navigation of information (Haas, 1996; Marshall, 1997; O'Hara & Sellen, 1997). Consequently, reading through a paper-based guide itself is not demanding.

Nevertheless, switching between the television and paper guide demands a transition in the way viewers think about choosing what to watch.

Switching to EPGs, such as Teletext and the OnDigital TV guide, appears to require a more significant transition. This explains why people in this research were not frequent users of onscreen guides and tended to use the method last. Not only is a transition necessary with onscreen guides, but the understanding of the workings of the process are also unfamiliar. Furthermore, the operations can interfere with how viewers understand the television to work; the buttons on the remote control, for example, no longer work as expected. Studying the use of several EPGs, Daly-Jones and Carey (2000) have confirmed that viewers find EPGs difficult to operate. Specifically, they found that viewers often made mistakes when using the remote control to access programme information. They also discovered that viewers had difficulty in getting into and out of the information services.

3. LESSONS FOR DESIGN

The programme selection methods described above have several implications for the design of next generation programming guides. These implications are discussed in the following sections.

3.1 Primary EPG

Our research into television viewing indicates that there is a common process people use to choose programmes. This process tends to be used in a set sequence that appears to be associated with people's perception of the effort needed to step out of the act of television watching. It seems that people choose information sources that require the minimum effort to make the transition from viewing to choosing a programme. They do this by using sources that are 'at hand' and that make the decision-making process simple.

This process raises several important implications for the design of EPGs. Perhaps the most significant implication for EPG design is that people have a preference for information sources that do not distract from the act of watching television. This suggests that an EPG will only be a viable solution if it can limit the disruption to people's sense of what television watching is about. To do this the transition from viewing to the EPG must not be perceived by viewers to be cognitively taxing. One design requirement could thus be that EPGs make use of the same perceptual modality people use to watch television. That is, the EPG should display programme options not as text but as images maintaining the visual-spatial modality. This could be achieved by displaying thumbnail images of the possible programme options.

Another way of reducing the cognitive demands associated with using an EPG would be to simplify the decision making process. As noted earlier, people already do this by limiting the number of channels from which they choose to about five. They also only choose from the programmes that are on now-and-next. These strategies could be supported through an EPG's interface. The programmes that were on now-and-next could be displayed as thumbnails for a viewer's five favourite channels.

An example of an EPG interface incorporating these design suggestions is presented in the Primary Programmes Guide Figure 2. The underlying idea to this design is that is provides viewers with quick and easy access to the information they refer to most frequently. It is thus referred to as the primary EPG.
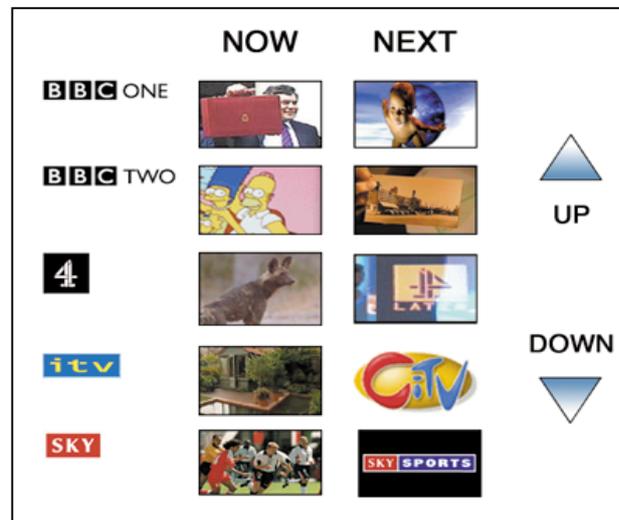

Figure 2. Primary Programmes Guide.

It should be noted that this interface is only an initial indication of how a design might actually operate. Specific usability tests would need to be undertaken to evaluate any design suggestion derived from this exploratory research. For instance, further research would need to be done to determine how people should access the Now-and-Next EPG. Allowing viewers to switch to the EPG through a single button press on their remote controls, for example, would be in keeping with the aim to minimise effort. However, this design suggestion cannot be substantiated with the existing data.

3. 2 Secondary EPG and reviews/editorials

Although people predominately use information sources to choose programmes that are on now and next, there are of course times when sources are needed for more detailed programme information. For example, viewers might want to find what is on later in the

evening or may wish to get further information on something they are currently watching. They might also want to read editorial pieces or reviews associated with programmes they believe might be interesting. To provide a solution for this, a secondary EPG must be considered that augments the primary system described above.

Several findings from our research into television viewing can be used as a starting point for the design of this secondary EPG. People's comments about existing paper-based guides, for example, suggest that extensive programme listings should still facilitate quick and easy access to information. People liked the way they just had to glance at an entire day's programme schedule in the paper guides to find out what was on. The channel-time layout frequently used in these guides appeared to afford this 'glanceability' because people needed only to interpret this familiar and easily understood technique for displaying information. If an EPG displayed programme information in a channel-time matrix it too would presumably take advantage of people's ease of interpreting information displayed in this way. Of course problems arise with this design suggestion. The limitations of resolution and screen real estate, for instance, constrain the amount of information that can be displayed. Solutions designed to display channel-time matrices taking these constraints into account would need to be carefully evaluated before there could be any certainty of their success.

It is not so clear how an EPG could be designed to accommodate people's access to programme reviews and editorial. Magazine or newspaper guides are not considered by viewers to be extremely successful at displaying this type of information. People often have difficulty finding specific reviews or editorial using these guides because the organisation of the information is not "transparent". The techniques used to display the information are also not consistent between guides making it difficult for people to establish familiar patterns of use. Paper-based guides thus provide few clues for how an EPG might enable access to reviews and editorial.

Another difficulty with designing EPGs for this purpose is that it seems people do not base their choice of programmes on the reviews and editorial they read. It may be that the reading of reviews or editorial materials is part of the separate guide-browsing activity. It is not entirely clear what people get out of this activity. Not having a full understanding of this makes it difficult to know how to design an EPG the meets people's needs in this context. It may be that part of the appeal of the activity is based on sitting back with the newspaper or a magazine and that an onscreen system could not provide the necessary affordances to be used in this way.

4. CONCLUSIONS

Numerous EPGS are available on the marketplace at the current time, bundled up with various set-top offerings. Our sponsor, who has some indirect commercial interest on the impact of these EPGs, wants to know what might be the kind of design principles that good EPG design is based upon, and wishes to test these against those used in practice. Our research shows not only that there might be cognitive loads that need to be borne in mind in EPG design, but also that these demands are related to the context of viewing; especially the three forms of viewing habits we describe. All current EPGs appear to be designed without reference to either the problem of cognitive load or this social context of use. Instead, they would appear to be designed on the basis of various rules of thumb developed on web-based information provision. This may well account for the low levels of regard that these EPGs are held in by the public at large, and indeed our sponsor's scepticism about them.

Of more importance, we believe, than the failures of the current crop of EPGs, is the approach to understanding user needs that we have presented. It is our view that good design should not only be based on the traditional techniques and concepts of cognitive psychology—such as notions of load and capacity—but should also take into account the kind of sociological materials that we have presented here, in this instance related to socially constructed habits and routines.

In addition to this interdisciplinary approach, we also believe that one should design for current practices in the first instance rather than for some posited notion of future user behaviour. In this case, though EPGs are expected to radically alter viewers watching habits—especially when combined with local storage devices—it is our view that those changes are less likely to happen if the initial form of EPGs is so alien to current practice that users find them all but irrelevant to their current viewing habits. If EPGs were designed for how people currently behave, they could not only find acceptance but might also be designed to lead users towards new forms of viewing in a gradual way. When they first use EPGs, users can get familiar with their particular interaction modalities, they can learn what the guides afford in terms of new ways of navigating to programme choice, and so on. At a later date, new releases of EPGs can then move them further away from their original viewing habits toward new viewing patterns; these may be unlike the three fold form we have described.

This might seem a pedantic way of designing for the future. It may be viewed as counter to the tradition of innovation and radicalness that pervades research in the digital technology

domain in particular. In these settings, one often hears the phrase, "Users don't know what they want because they can't see the future". But at the DWRC, we have found that taking users current practices seriously has led us to uncover importance issues that can be of huge importance in ensuring that new services, products and technologies can be successfully introduced in the first place. We have focused here on home entertainment, but our research has also looked at many other areas too, especially in the mobile domain. We hope to have given some clue as to why this approach has enabled us to provide value and insight.

REFERENCES

Black, A., Bayley, O., Burns, C., Kuuluvaineng, I., & Stoddard, J. (1994). *Keeping Viewers in the Picture: Real-World Usability Procedures In The Development of a Television Control Interface*. Paper presented at the CCHI '94.

Daly-Jones, O., & Carey, R. (2000). *Interactive TV: A new interaction paradigm*. Paper presented at the CHI 2000, The Hague, Netherlands.

Haas, C. (1996). *Writing technology: studies on the materiality of literacy*. Mahwah, N.J.: L. Erlbaum Associates.

Logan, R. J., Augaitis, S. R., & Miller, R. H. (1995). *Living room culture - An anthropological study of television usuage behaviors*. Paper presented at the Human Factors and Ergonomics Society 39th Annual Meeting.

Mateas, M., Salvador, T., Scholtz, J., & Sorensen, D. (1991, April 13–18, 1996). *Engineering Ethnography in the Home*. Paper presented at the CHI '96.

Norman, D. (1999) *The Invisible Computer*, MIT Press, Boston, USA.

O'Hara, K., & Sellen, A. (1997, 22-27 March 1997). *A comparison of reading paper and on-line documents*. Paper presented at the CHI '97, Atlanta, GA.