Programming Culture in the 2nd-Generation Attention Economy

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ABSTRACT
In this paper, we consider how the relationship between content providers and content consumers is modified by configuration (especially in the case of end-user programming) and by measurement (especially in the case of audience statistics). This allows us to bring together social, economic and cultural concepts that sound as though they should be related, but seldom are: the kind of programming done to a computer as related to the kind done by a broadcaster, and the kind of attention measured by an economist as related to the kind measured by a psychologist.

Author Keywords
End-user configuration, audience measurement.

ACM Classification Keywords
K.4 Computers and society, K.4.1. Public policy issues

INTRODUCTION

In a typical household, everyone is vying for attention. From a misbehaving child to a demonstratively affectionate parent, a crying infant or a provocatively dressed adolescent. Household members also guard their own attentional resources, trying to get time alone to attend to a newspaper, videogame, or soap opera. In contemporary media-saturated households, there are also external agents making demands on the attentional resources of family members. These include (obviously) advertising media in many forms, including many internet business models, but also more subtle appeals to various categories of "social good", including educational and cultural media content that is delivered by public service broadcasters.

In this paper, we consider how the technically mediated relationship of attention control and measurement between content providers and content consumers is changing. Traditionally, this is an arms-length relationship. Manufacturers and broadcasters deliver to consumers and audiences, who rely on survey and sampling methods to modify their offerings. However digital media allow both programme content and appliance behaviour to be modified directly by consumers. Our perspective on this process comes from the development of new programme material suited to this environment (Postgate) and the design of adaptable and configurable media technologies through end-user programming (Blackwell).

RECONFIGURING HOME TECHNOLOGY

In traditional computing, the ability to modify the behaviour of technical systems is described as "end-user programming," aimed at people who are not computer scientists, but usually focused either on the empowerment of business users (Nardi 1993), or the construction of future computer scientists through early programming education. In contrast to this research, we have taken special interest in the varieties of programming that take place in the home. Rather than viewing the home as an extension of professional behaviour (for example enthusiasts and hobbyists who use sophisticated professional tools at home), we focus on simple forms of programming that may improve quality of life for ordinary members of a household by giving them increased control over everyday technology.

Programmable Appliances

In focusing on domestic programming, we turn from large scale bureaucratic computer systems to the deployment of computers and embedded microprocessors in the home. These are programmable by the end-user, albeit in simple ways. However despite their simplicity, they still exhibit the characteristics of large-scale programming, by extending user control beyond direct manipulation, to abstract specification, multiple contexts and future events. As early as 1999, we catalogued the extent to which even "analogue" domestic audio appliances already supported abstract rather than direct manipulation functions (Blackwell, Hewson & Green 2003). In a comprehensive survey of a consumer electronics store, we found that small hifi systems included on average 10.8 controls operating on abstract internal state, rather than controlling sound reproduction. Today's digital media products such as recordable compact discs, personal video recorders, DVDs and MP3 players increasingly expose directory management and menu structuring facilities. In an ethnographic study of families' technology use, we found large numbers of appliances whose behaviour can be modified in some way by members of the family (Rode, Toye & Blackwell 2004).

Configuration as Attention Investment

In our analysis of programming as a domestic phenomenon, we have investigated the extent to which work-oriented behaviour models can be applied or adapted to the understanding of domestic technologies (Rode, Toye & Blackwell 2005). In previous research we developed a cognitive model of end-user programming (the Attention Investment model – Blackwell & Green 1999, Blackwell & Burnett 2002), that describes the creation of abstractions during problem-solving as an economic activity, accounted for in terms of the pursuit of efficiency in workplace tasks. In the domestic context, the attention investment model describes the choice between controlling some appliance by direct manipulation, or devoting some mental effort to automating its behaviour by programming it (Blackwell 2002).

Our new concern is with the relationship between the attention devoted to the technology itself (modifying its behaviour, customization etc), and the attention devoted to the programme content. This latter is also an attention economy, but one with significant financial, cultural and and social implications.

MEASURING HOME AUDIENCES

Media enterprises must be able to measure their audiences, in order to support the economic environment that funds large scale content production in a sustainable way. However when users are able to configure either their technology or programme content, the consequences for audience measurement have significant implications for content producers and the relationship between them and their audiences.

Technology configuration

Attention devoted to the configuration of new technologies can lead to changing conditions under which programme content is distributed and consumed. Principal among these effects are time shifting of linear broadcasts, device shifting of material from one access device to another and pico distribution between end users outside of traditional distribution models. In theory these changes should mean that the attention invested by audiences results in a higher aggregated amount of attention devoted to the content, because flexibility increases opportunities for consumption.

However traditional methods for measuring broadcast media audiences only account for linear distribution at fixed times and to a fixed range of access devices. Unless audience measurement can be extended to consumption that results from end-user configuration the aggregate increase in attention cannot be translated into economic terms. This issue is particularly important given that the cost of production may increase because of the potential for end-user configuration either due to investment in additional distribution technologies or increases in rights payments.

In updating audience measurement frameworks two key problems that need to be addressed are the measurement of consumption over an extended period of time rather than within a specified broadcast window and consumption that results from distribution not initiated by content providers.

A solution to the first might come from structural changes to the business environment within which large scale content producers operate; an example might be that consensus shifts from measurement occurring at a given time to measurement being understood over given periods – release date, week 1, month 1, year 1, cumulative total. The choice of periods has some significance, but it is the existence of a consensus amongst actors that is most important to sustainability of the current content production environment.

Distribution between end-users of broadcast content is made possible through the digitization of material and the configurability of devices. Examples might include the exchange of video content using a USB key or the exchange of an audio broadcast using a Bluetooth connection between mobile devices. This type of distribution can be seen as positive for content producers because it increases the attention expenditure of audiences with little incremental distribution cost. It is even possible to argue that distribution that results from a form of personal recommendation means that the content itself will be more valued by the end user. In order to benefit from this type of distribution, broadcast content providers need to establish appropriate measurement infrastructure. Quantitative measurement is complicated by the absence of a direct network connection between the end users involved and the content producer, however useful models exits from more traditional content industries. The concept of ‘footfall’ in front of billboards or the concept of ‘hand on’ in the case of magazines. Given that pico distribution results from a transaction between a content producer and a known end user the basis for survey based methodologies exists.

Another reaction to non-linear consumption and pico distribution is to alter programme content itself. This does not modify audience measurement techniques but instead attempts to account for deficiencies in current methodologies. Ways in which programme content can be changed include the use of product placement or ‘idents’ at the beginning and end of a programme. This ameliorates the effect of programming to avoid commercial messages by integrating those messages more closely with editorial material. It is conceivable that more effort will be made to ensure that commercial material is valued by end users so they are happy to consume it alongside editorial output. There is also the development of new broadcast formats that are designed to aggregate audiences around a specific (and currently measurable) broadcast window. The final of a reality TV contest might be available to view on-demand but the nature of the ‘event’ means that most end users would prefer to experience it live. In this sense it is an entertainment format that is designed to mimic the characteristics of traditional community experiences such as sports fixtures.

Programme configuration

One of the techniques used to create the new formats described above is the ability of end users to configure programme content; in the case of a reality TV final various return paths are used to alter the editorial outcome of the show. The configuration of programme content by end users is accelerated by digital systems and can take many forms. The example above, along with others such as text messages sent to a radio station or videos sent to a news broadcast use individual configuration to create a consolidated, shared experience. The content producer acts as an editor. Other forms of end user configuration include interactive features that allow a more personalized experience to the creation of new programmes by audiences using material sourced from content producers. Here the traditional content producer acts as a catalyst for subsequent creative activity. As described above programme configuration represents attention expenditure by audiences. This occurs in addition to the attention traditionally measured by broadcast content providers (passive consumption).

Audience measurement frameworks must be updated to account for this additional attention if benefit is to be passed to content providers. In some cases this already happens. Recently the final of two performance based shows were scheduled against each other in the UK. Their relative success was measured by conventional ratings and by the total number of votes each received. However each show was the winner by one of the metrics. This led to an industry debate about which show was the most successful, and whether number of votes was a valid audience metric. Similar metrics to measure different types of programme configuration, even including the creation of new content by end users, have yet to be established. As with technology configuration a consensus among actors within the content creation environment is as important as the metrics that are chosen to measure programme configuration.

It is clear the development of both types of end user configuration radically complicate audience measurement. Not only are new forms of measurement required for each but they may need to be integrated so that programme configuration metrics extend over time and across devices. This complexity is then placed in the context of the multinational consensus required to support large scale content production.

THE 2ND GENERATION ATTENTION ECONOMY

The attention investment model describes the way that people choose to allocate their effort when using digital technology, either to direct manipulation or to programming. “Attention” in this model can be considered as a quantity of concentration, based on theories such as Kahneman’s (1973) mode of attentional effort. However this view of attention investment might be contrasted with Goldhaber’s (1997) description of the ‘attention economy’, sometimes crudely quantified as the number of ‘eyeballs’ captured. In the traditional world of broadcasting, commercial broadcasters act as attention aggregators of this kind of passive attention. By broadcasting program content, they harvest an aggregate of individual attention, which can then be sold on to advertisers, whose business is to bring attention to products.

Interactive media have modified the boundary between attention investment (a private domain, chiefly concerned with what happens inside the head of the “users”) and the attention economy (a public domain, in which we can directly observe ‘bums on seats’ or ‘eyeballs’ of an audience). Early web advertising was sold on an ‘eyeball’ model in which the goal was simply to present content on the screens of an otherwise passive audience. However this traditional screen-based sales model was rapidly replaced by measurement of ‘click-through’ – an action in which users have invested attentional effort. Companies buying television advertising would also love to know whether anyone is concentrating on their advertisements, but at present they must be satisfied with ratings measures. The commercial value of media, and the rising value of web services, is determined by what can be measured.

Programmable, customisable and non-linear media consumption has often been considered as a threat to the advertising industry. Time-shifting of programs, whether with VCR or hard-disk video recording, makes it increasingly likely that viewers are not watching advertising material inserted between program segments. Some advertising is still watched, but the discontinuous nature of viewer attention makes it far harder to measure, hence the reliance on high-value content modifications such as product placement and ‘idents’.

Even where viewer numbers are increased by new technology, as when mobile video is shared among phone owners, the commercial value of such picodistribution is hard to assess without data on the scale of the distribution. The advertising industry, and hence broadcasting revenue, relies on consensus about the relative value of different programs. As we have noted, without consensus on the measurement of relative value, a market cannot exist, and the business model of the broadcast content industry cannot survive. Where new broadcast formats require substantial investment in technical infrastructure, that investment will depend on the development of appropriate attention metrics.

We have identified a scale of increasing levels of attention invested by the user/viewer that correspond to different configurations of interactive technology:

i) audience feedback, for example sending SMS votes for contestants on a reality show;

ii) participation in an online community, for example contributing to a message-board discussing programme content;

iii) user-generated content, such as broadcast video diaries; and

iv) non-commercial content reuse, such as multimedia school homework, mash-ups, or VJ mixes.

These four levels of attention investment in broadcast programming broadly correspond to four levels of audience engagement that has been developed in web content:

i) customer ratings, as on Amazon;

ii) annotation and meta-tagging folksonomies, such as flickr;

iii) user-generated content, as on Wikipedia; and

iv) open source development and creative commons content.

These increasing levels of user-engagement clearly make it even more difficult to measure old-style viewer attention, and to maintain industry consensus over traditional metrics.

However, just as the web made the transition from measuring page-impressions to click-throughs, these new investments of viewer attention represent increased media value. If a friend sends me a copy of a video clip that she archived on her phone, the original broadcaster might never know this, but I may value it more than if I received it directly. If a piece of stock footage is reused in non-commercial content, does it increase in value, just as the value of the James Brown brand was increased by the thousands of hip-hop artists who sampled his screams? Perhaps more active forms of engagement with program content represent a qualitative improvement in viewer attention, that ought to be assessed independently of conventional quantitative measures.

SOCIAL IMPLICATIONS

Where does a public service broadcaster like the BBC fit into this second generation attention economy? In one sense, public service broadcasters might be in a position for technical leadership, because they have always been concerned with qualitative justifications for programming, not simply quantitative. They could also be leaders in creative commons programming based on their extensive public archives. However public service broadcasters are also constrained by problems of measurement. They must justify public investment (in the UK, levied directly from the public via a compulsory licence fee), and be subject to public accountability. The easiest, most straightforward, measure of accountability is simply to apply the same consensus metrics developed for use in the advertising industry. However this easy option may fail to allow the new roles of the public as interactive investors of attention in public broadcast as digital campfire, cultural reservoir or trusted interpreter of the digital domain.

The social dynamics of media consumption within the home are largely determined by the perceived communal value of programme content. In the days of uniform terrestrial broadcast networks, national public service broadcasters could play a conventional (if paternalistic) role to offer a cultural consensus within which such value could be negotiated. The various forms of attention that are now invested in configuration and programming by individuals have transformed that relationship, well beyond the stereotype of familial conflicts over VCR usage, to questions of how each home participates in our media society.

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