new media & society

London, Thousand Oaks, CA and New Delhi
Vol2(3):286–312 [1461–4448(200009)2:3;286–312;013633]

THEMED SECTION

Media diversity and cultural identities

The development of multimedia 'content' in Ireland

APHRA KERR
Dublin City University

Abstract

It is often suggested that new media may provide a new means to preserve the diversity of cultural identities in an increasingly global media environment. In order to address this suggestion, this article first analyses different conceptions of new media/multimedia and how the dominant discourses at a national and European level tend to focus on the economic and technological potential of multimedia rather than its wider social or cultural role. The article continues by analysing how these wider discourses and trends interact with more local factors to shape the form and content of multimedia artefacts produced in four organizations based in Ireland. These organizations were attempting to produce multimedia artefacts specifically designed for Irish, French and German users. The article explicates the processes by which global technologies are actively shaped within local production and consumption contexts and highlights a number of important political, economic and social factors which actively shape attempts by organizations to develop diverse forms of multimedia content.

Key words

convergence • cultural identity • design strategies • diversity • globalization • information society • Ireland • multimedia

INTRODUCTION

This article examines the development of multimedia and asks the question: 'Can new media be used to preserve the diversity of cultural identities in an increasingly global media environment?' Given the embryonic state of the multimedia industry the answer must be tentative. Yet if we examine empirically what is happening from a social shaping perspective we can attempt to identify the factors which have shaped current developments and suggest possible alternative paths (Edge, 1988; Wajcman, 1991; Williams, 1992, 1996; Winston, 1996).

The article draws upon four case studies conducted during 1997 and 1998 in multimedia production companies in Ireland who were producing both offline and online content aimed at domestic and foreign markets. Based on this work it is proposed that while new media have the potential to democratize media production these case studies illustrate that for both multinational and indigenous companies particular economic, political, cultural and technological factors act to limit this potential and intervene directly in the content innovation process.

This article will explore these factors and look at the tensions between on the one hand the economic logic towards globalization and maximizing economies of scale and on the other hand the artistic ideals of satisfying particular standards and diverse cultural markets. It will also examine the thesis that technological, industrial and media convergence is an unproblematic process, which threatens nation states and small peripheral cultures.

In a small English-speaking state like Ireland where the media are increasingly pervaded by content and cultural forms produced in America and Britain, policy makers must be actively encouraged to support the production of alternative cultural texts if new media are to remain a locally relevant and diverse media form. They must also be encouraged to broaden their conceptualization of multimedia beyond purely technical and information terms. These propositions challenge accepted neo-liberal arguments for less state intervention and the discourse of the information society, which tends to collapse different types of content into the generic category, information. This article argues for a shift from transmission and information based models of communication to more 'content-focused' models where the use and meanings attached to the communication become the main issue (Carey, 1992).

MULTIMEDIA AS TECHNOLOGY AND CULTURAL FORM

Historically broadcast media were limited, for technological reasons, to distributing their content within a limited geographic space. As a result media structures developed in particular and distinctive ways within national states supporting the public sphere and playing a role in constructing

distinctive and unified national identities. Research on the development of the mass media has highlighted how through their programming and scheduling they contributed to a sense of societal and cultural unity.

> . . . we are living in the electronic age whose media substitute all-at-oneness for one-at-a-timeness'. . . . TV has been found to provide a social bond in depth. (McLuhan, 1964: 331)

New information and communication technologies (ICTs) have overcome these technical limitations and assisted by liberalized political and economic regimes multinational broadcast, print, film and music organizations have jostled to secure access to international distribution networks and provide standardized content to the largest audiences possible. Political economists have noted that these trends have tended to restrict the form and content of mass media messages rather than promote media diversity (Featherstone, 1990; Golding and Harris, 1997; Golding and Murdock, 1997). Despite these criticisms the dominant discourses in Europe and America still strongly promote industrial convergence and deregulation in all industries, including the media, while increasingly conceiving of the communications process in purely transport and transmission based terms. In policy documents the lack of attention given to content, its quality and diversity, is reflected in the tendency to value information in purely economic terms rather than in relation to its wider cultural or semantic value. This approach is clearly evident in various information society documents (CEC, 1994; ISSC, 1996; NTIA, 1993).

Multimedia technologies and applications have emerged within, and been shaped by, these dominant discourses and interest groups. A close examination of the development of multimedia in Ireland reveals that the current consensus which defines multimedia in relation to its technical attributes and transmission capabilities was shaped by the marketing and advertising hegemony of major computer hardware and software manufacturers worldwide since the early 1990s. Prior to this people's perception of what constituted multimedia was much more 'flexible', often depending on one's disciplinary background. Multi-media was often hyphenated and used to indicate the use of more than one media simultaneously in educational or performance settings.[1] Today, multimedia generally refers to the integration of different media on one digital channel and more specifically within the personal computer (Jankowski, 1996; Kerr, 1997; Williams, 1999).

Some communications scholars characterize multimedia artefacts not in relation to their technical attributes but in relation to their potential to enable new forms of mediated and interactive communication (Hanssen, 1996). Existing telecommunications and broadcasting networks combined with new multimedia technologies enable a producer to create new spaces

through which geographically dispersed end users can communicate at relatively low cost. These characteristics may enable some user/producers to contribute to the maintenance of distinct and ritualistic communication processes between dispersed cultural communities. The potential exists therefore for the emergence of radically different media structures and forms as well as the re-shaping of traditional media structures and forms.

Evidence from empirical studies on new media developments indicate that this radical potential is not being realized for a number of historical and social reasons. At a formal level Hanssen (1996) and Friedman (1995) point out that existing forms of interactivity are limited by past textual and mass media forms as well as existing conceptions of what constitutes interactivity itself. Interactivity is not, they argue, a medium characteristic, but rather it is a result of media, message and user interaction. At best most multimedia artefacts can be classified as reactive or quasi-interactive with the user only allowed to choose from a limited number of alternative routes.

Importantly they argue, in line with this article, that definitions of new media must be considered more broadly to include not just the carrier of the information but also the information as form and content. While the two levels are mutually dependent, it is the second level which is often ignored by information society and information economy studies. Within communications, critical attention to the form and content of a message and the intertextuality between different media has a long history. Williams (1974) for example, developed this perspective in his analysis of the development of television:

> There is a complicated interaction between the technology of television and the received forms of other kinds of cultural and social activity. Many people have essentially said that television is essentially a combination and development of earlier forms: the newspaper, the public meeting . . . yet it is clearly not only a combination and development. The adaptation of received forms to the new technology has led in a number of cases to significant changes and to some real qualitative differences. (Williams, 1974: 44)

This article conceptualizes new media as 'culture industries', adopting the term first developed by the Frankfurt school in relation to the mass media (Adorno and Gurevitch, 1977). The cultural industries, while undoubtedly economic entities which, generate jobs and wealth, and are shaped by technological developments, are also uniquely a 'mental machinery' (Neale, 1985). Thus they produce pleasures and meanings which must satisfy more intangible needs than mere functional goods.

While researchers from the social studies of science and technology would argue that an everyday utensil may fulfil symbolic as well as functional uses, this thesis would concur with the EMTEL (1995) network when they asserted that cultural artefacts represent a 'double articulation'. Media

artefacts have meaning both as objects and as media which mediate between public and private culture.

Thus new media, in common with traditional mass media, can be examined not just as economic entities but also as cultural entities that play an important role in helping to constitute communities in space and time by communicating social experience through socially accepted cultural codes.

> The media have a unique twin role in our lives. On the one hand they create and distribute many of the symbolic and cultural resources we require to make sense of the social world we inhabit. . . . On the other hand, however, the media are also major institutions in the economic and political fabric of our societies. (Golding and Murdock, 1997: xiii)

This article proposes that multimedia artifacts can be defined as both technology and cultural form. As cultural forms they are crucially implicated in the production of meaning and the construction and reconstruction of cultural identities and cultural communities (Jones, 1995, 1997). However new media and indeed many cultures and communities are no longer tied to particular nation states or geographic locations but dispersed in time and space on a global scale.[2] In order to investigate the role that new media can play in relation to cultural diversity in this new postmodern geography this article examines the process of multimedia content production in the context of a small peripheral nation with a large diasporic community. In each of the four cases studied the organizations were producing multimedia content which they believed was meaningful to distinct geographical, linguistic and cultural markets.

COMPUFLEX: THE NATIONAL AND ORGANIZATIONAL CONTEXT OF INNOVATION

When examining the development of new media products this article argues that particular national and local economic, political and socio-cultural processes shape the extent and forms of global media flows. This article contends that the global movement of media products, people and commodities do not necessarily imply a homogenization of cultures and the convergence of nations in crude 'cultural imperialist' terms (Sreberny-Mohammadi, 1996). Nation states still play an important role in promoting media developments while contexts of use must be considered as a vital stage in the production/innovation process.[3]

These assertions are made in the light of research conducted in a multinational software company who located its localization and distribution point for the European market in Ireland in the 1980s. Interviews in this company and research into state policies towards such companies, highlight how industrial development agencies in Ireland have financially supported the establishment of multinationals like Compuflex (and continue to do so).

These industries are valued for their employment and wealth generation potential and have contributed significantly to the current economic growth in Ireland and the fact that Ireland is now the second largest exporter of software into Europe after the United States (Kerr, 1999).

Another significant attraction for such companies to locate in Ireland is the unusual demographic structure of the Republic of Ireland. In a very small labour force of only 1.4 million, and due to the higher than average birth rate and the emigration of many middle-aged people, Ireland had a uniquely young workforce. By 1996, even in the context of a recent fall in the birth rate, 41 percent of the population was aged under 25 and a further 28 percent aged between 25 and 44 years (CSO, 1996). Combined with the high levels of attendance at secondary and third-level institutions, Ireland has long been perceived, and promoted, as having a well-educated, youthful and English speaking workforce (Clancy, 1995). 'Almost half of school-leavers continue into third-level education in Ireland, which produces, proportionally, the highest number of scientists and engineers in the OECD area' (OECD, 1997).

A final attraction for foreign-owned companies to locate in Ireland has been the relatively low level of wages compared to the rest of Europe and the lack of industrial disputes. This situation has its basis in the high degree of social consensus since the mid-1980s and a number of wage and tax agreements between the government, unions and voluntary organizations. These agreements have contributed to maintaining modest wage increases in the private sector in the context of rapidly expanding output this decade.

Tax incentives and capital grants, in conjunction with a youthful, well-educated workforce, and membership of the EU, certainly added to the attraction of Ireland as a location for Compuflex in the early 1980s. Since then the company has undergone a number of transformations as their portfolio of products has changed and their facilities have had to change to reflect this. This has entailed investment in plant and infrastructure as well as the need to build up networks of sub-suppliers and intermediaries within Ireland and in Europe. It is not clear however, despite the assurances of interviewees, if they have become 'embedded' in the local.[4]

Organizational culture of innovation

Compuflex is probably one of the largest computer software developers in the world.[5] It established a base in Ireland in the early 1980s and today employs 1000 people. These concentrate on the localization and repackaging of software products developed in the United States with little original research or development conducted in Ireland. The company employs over 25,000 people worldwide and net revenue for 1997 was $11,360 million, 60 percent of which was generated by overseas sales.

From its establishment Compuflex has dominated each emerging new area of software: from operating systems to desktop applications, from networking software to internet browsers. During the 1980s, Compuflex diversified from desktop software into multimedia content products, initially focusing on CD-ROM based reference products. By the early 1990s, the company was probably the most successful CD-ROM producer in the world with considerable sales and market penetration, assisted by their strategy of bundling products together and their extensive distribution and sales networks. These products were developed in the USA, localized and exported around the world.

Following their relatively unproblematic move from software tools development into CD-ROM development the company decided to expand its multimedia activities to include an online service. The company established the Compuflex Network (CFN) as a proprietary online service in 1995. The content on this service was aimed at technical and specialist users and largely developed by specialist partners. By the end of 1995 the service had 525,000 subscribers, while its main competitor America Online (AOL) had over 4 million. Reports in the press noted that the service was slow, technically too complex for modem users and thin on content.

By 1996 it was apparent that the internet was replacing proprietary technologies and services. New internet start-up companies like Netscape were challenging the dominance of companies like Compuflex and AOL. The desire to respond to these challengers, to generate alternative revenue streams to their rapidly maturing core products and the need to capture market share in the new emerging home computer market prompted Compuflex to act. The CFN service was re-launched at the end of 1996 as an internet based, full multimedia, entertainment service aimed at mass audiences/users in the home.

Importantly for this article, Compuflex decided to produce the content for this new service inhouse. Without a clear conception of the form and nature of the content for this new internet based service the development team in the USA initially adopted US television metaphors. The main centre in the USA began developing TV style shows (women's shows, science fiction, news), while the 'affiliates' worldwide would localize these shows for their national networks. Each show would run for up to six weeks and then be replaced by the next show in the series. In addition the service offered information services on everything from cars to holidays, chat forums and bulletin boards. The design of the interface was clean and minimalist: a black background against which a strip banner contained the service logo and four headings with drop-down menus.

The marketing for this service highlighted the 'premier content', the 'stronger sense of community' and the 'member's services' offered. The service was available for 30 days' free trial, integrated into the company's

new operating system and distributed via newspaper and music shops in the USA and Europe. By 1997 it was the third largest online service in the world with 1.5 million subscribers in the USA and another 1 million worldwide. At this stage the service was losing $200 million a year (Clark, 1997).

COMPUFLEX: THE LOCALIZATION OF ONLINE CONTENT FOR EUROPEAN USERS

The diversification from software tools to multimedia content creation was viewed as a natural development by Compuflex given the technological and industrial convergence patterns which had emerged in the IT and software industries. While the localization of packaged office software can be largely automated, the localization of content for their CFN service, however, proved an entirely different scenario. Here the empirical work provides some interesting pointers to the limits of convergence and the tensions created when the standardized content constructed by a global multinational producer confronts the needs and desires of users in different cultural markets. The ongoing negotiations between the development team in the USA, the localization team in Ireland and the editorial groups in France and Germany point to the continuing salience of cultural differences between markets and the active role of the end user in new media content production.

Within Compuflex the established routines for software and CD-ROM reference title development informed the routines adopted for the new online service: products developed for the US market were localized in the USA and exported to the French and German markets.[6] However efforts to localize CFN content in the USA for these markets proved highly unsatisfactory. Interviewees reported that, for example, the voice-over for one show aimed at the French market was done by actors speaking French with US accents.

> . . . when Compuflex started localisation – they were doing it over there [in the US] and they weren't selling a thing. . . . So they sent their marketing people over to France and Germany to see why it wasn't selling and they came back with this information – it's not French – the reason it is not selling to a French market is because it's got Americanisms – so they let people in France and Germany set up an affiliate group. (Andrew, chief engineer)

In addition to the establishment of local market affiliates a CFN team was established in the Irish branch in September 1996.[7] The Irish team's task was to mediate between the USA and Europe and to co-ordinate the localization process. The problems they faced ranged from simply co-ordinating work between different branches in different geographic and time zones to negotiating more fundamental tensions between the technological

and market driven interests of the mother company and the more culturally sensitive interests of the subsidiaries. The latter is of most interest here.

Once established the CFN team in Dublin hired a multimedia editor to supplement their core technical skills and tried to source native speakers where possible to work on the localization of texts. Even this strategy proved problematic. Many of these problems stemmed from the organizational culture of the company, which was rooted in the production of 'content-less' software tools and meant that business strategies emphasized technological innovation rather than the style and nature of the content or end users issues.

> . . . we had a lot of problems with editing material because they [Compuflex] had never used editors before and the French and German producers were turning down the localised shows . . . saying that the language was unsuitable, etc. so [this entailed] setting up a slightly different production process to what we would do for a regular CD-ROM. (Ann, content editor)

The organizational tension between global technological imperatives and local content/consumption issues is illustrated by the negotiations between the official linguistic personnel who proposed using standard terminology in all products and the producers in-country who proposed using colloquial language. Clearly the editors in France and Germany believed that the use of standardized language was a factor in the slower than expected penetration of the CFN service in their markets. Further, it became apparent that localizing this type of information involved more than just linguistic translation. The US-produced shows also had to be 'editorialized' in order to attune the content to the cultural tastes of their market. This involved adapting the style and approach of texts, removing culturally specific references to America and reducing the complexity of content to lessen download times.[8] Such extensive revisions were resisted, however, by the US development team who appeared not to recognize the cultural specificity of their own products or to appreciate the cultural specificities of their target markets.

As an intermediary in this process the Dublin team developed their own informal procedures for choosing which content to localize.

> Intuitively, by just knowing what the markets are . . . that French people in general don't really want American culture stuffed down their throat – talking to producers, knowing how they feel – what they want on their channels, what they think are priority items and what they think are trashy and just trying to communicate it to American . . . which is very difficult because most of the time they're all very technical people . . . you get a bit of a blank wall all the time, and they just say things like 'just dub it out, dub it out and give it to them'. (Ann, content editor)

To the surprise of the team in Dublin, significant differences in online consumption patterns emerged between Germany and France over time. In

Germany, where media audiences are generally more tolerant of dubbing for foreign language programming, online users were found to accept more 'Americanisms' in their online texts. The French however preferred their content more completely localized and this was reflected in their online media usage as well. There are interesting crossovers here between traditional media consumption norms and emerging patterns of usage with new media.[9]

By January 1998, just three and a half years after its launch Compuflex announced that CFN was to be redesigned and relaunched for a third time. The new strategy involved removing all the shows from its online service and moving away from inhouse content production. The company decided to become a portal site, offering access to content produced elsewhere, usually by local well established media companies and concentrating instead on offering transactional and communications services e.g. travel services which cost less to produce, required little localization and were potentially revenue generating.

This 'failed' attempt to diversify from developing software tools and reference type CD-ROMs into an online multimedia service serves to highlight the different competencies, organizational and individual, required to develop different types of information and indicates that there may well be limits to the convergence of information industries. The case also shows how entrenched past learning and routines can be and how difficult it can be for a company to capture the skills and competencies necessary to move into a new industrial sector.

> . . . it's the nature of the content, not that it's online.... Compuflex aren't used to producing or localising entertainment stuff . . . reference material in services are slightly closer to drawing on banks of databases . . . there are not as many problems with the services side of CFN localisation. (Ann, content editor)

In addition, this case clearly indicates that the global export of standardized content for new media is not a straightforward process despite the removal of political, economic and technological barriers. In the first instance the establishment of local affiliates indicates that Compuflex required the involvement of 'intermediaries' in the production process who were more familiar with the cultural codes and conventions of local contexts of consumption. The national affiliates for the CFN service actively negotiated aspects of the service citing the use of language and the lack of cultural affinity in the texts as the main barriers to diffusion. Indeed, increasingly, while subsidiaries in different countries had to adhere to the overall company strategy for CFN, they were allowed to produce their own content also. The tensions between the producers in the USA and the affiliates in the different cultural contexts serve to illustrate that the

globalization of new media production is not eliminating cultural differences in a straightforward manner and resulting in a unified, homogenized global culture. Instead this case points to the intense negotiation between, on the one hand the economic and technological rational which justifies maximizing economies of scale and both national and local cultural politics.

Finally, the shift away from a subscription-only service which incorporated complex shows to a free service which offered more communications services like email may point to a maturation of the internet as media and cultural form and a move away from a dependence on conventional television and print forms.

'Costs vs returns': the implications for diversity

Ultimately the USA, Dublin and the affiliate teams had to determine if the work needed to localize a given text was justified in relation to economic criteria. A text was deemed suitable for localization depending on the extent to which the content was 'Americanized' and the potential cost of localizing it either partially or totally. The affiliate companies in Europe would take content sent from the USA and Dublin, assess it, and if satisfied that it could be localized would allocate a budget to the Dublin team for the work. The Dublin team was thus dependent on commissions from these affiliates for their work.

In some cases it was found that the affiliates rejected shows after they had been localized in Dublin and this resulted in intense cross-national negotiations and both budgetary and scheduling problems. Indeed even with the more generic aspects of the online service various projects were postponed or dropped as the Dublin team waited for financial resources and editorial decisions from teams in Europe and the USA. This was the day-to-day manifestation of tensions between multinational economic interests on the one hand and national and local cultural interests on the other.

The globalization strategy for the CFN service initially targeted a limited number of large markets including France, Germany, Australia and Japan. Despite its location in Ireland the company's production of content for a small market like Ireland is best illustrated by following the hyperlink from the international CFN site to the 'UK and Ireland' site. Frequent visits to this site found that it contained only occasional references to cultural events in Ireland. This 'Irish' content was developed in the UK while, ironically, the Irish team concentrated on localizing US content for the European market. CFN staff felt that the Irish market was simply too small to justify the development of market specific content. While hardly surprising, this fact does call into question the Irish government's continued reliance on multinational software companies as a means of developing an 'Irish' information society (ISSC, 1996).

It is clear from this research that multimedia markets are only emerging and companies are still searching for a profitable business model. Compuflex experimented with a subscription-only service but then changed to a free service funded by a mixture of advertising, transaction services and cross-subsidization from its other service areas. Even with 2.5 million subscribers worldwide, by 1997 the service still made significant financial losses. The issue of development costs and funding was clearly an important determinant shaping the nature and form of the content generated for all the cases. It is clear that while the costs of distribution via digital technologies may have fallen, the cost of content creation has not.

The other three indigenous cases studied by this research project were unsurprisingly, given their target market, not driven by a purely economic logic. These cases were chosen specifically because they were engaged in the production of multimedia content aimed at the Irish domestic market and a relatively unknown internationally dispersed diaspora. In contrast to the Compuflex case, therefore, these cases tried to exploit the cultural specificity of their end users in both the form and content of their products. As a result they provide evidence as to how cultural identities can be preserved and shared in a more ritualistic manner in the context of the particular characteristics of new media.

Again in contrast to the experience of Compuflex Irish agencies were not active in supporting the establishment and development of these three Irish indigenous multimedia projects.[10] All three companies had problems convincing potential funders that the sharing of Irish cultural content was a worthwhile exercise.[11] The search for funding and legitimization experienced by these companies is in sharp contrast to the availability of funding within Compuflex and their ability to cross-subsidize new projects with profits from other products. It also serves to highlight how the national context of innovation can shape attempts by companies to develop innovative products.

All three cases found that in order to explain multimedia to both funders and end users, overcome their fears about the technology and enrol their support they needed to have working prototypes with engaging content. They found that content which was locally relevant but produced to a standard that rivalled global media products was the best approach. One company called this a 'Trojan horse' strategy.

> . . . our whole kind of focus...was to go to the local cultural things and really use those as little 'Trojan horses' and to go to the local institutions . . . all sorts of people who we feel should be influenced in some sort of way . . . about multimedia and its future potential . . . take the things that they believe a lot . . . see as treasured part of their tradition, in Derry terms Colm Cille is the big one. (Michael, Nerve Centre)

THE NERVE CENTRE: THE DESIGN OF CD-ROM CONTENT FOR IRISH USERS

The Nerve Centre, located in Derry, set out to develop a CD-ROM based on the life of a local Saint whose cultural significance unites diverse political traditions in Northern Ireland. The *Virtual Museum of Colm Cille* consists of a fictional 3D animated space in which models of real and fictional artefacts accompany stories and games which all relate to the life of Colm Cille. Colm Cille was a 7th century monk who according to folklore founded the city of Derry, and later went on to found a monastery on the island of Iona off Scotland. His missionaries travelled throughout Europe promoting Christianity and Celtic forms of art. The aim of the CD-ROM is to allow secondary school students and visitors to museums to navigate around the virtual museum using a mouse and by clicking on different objects learn more about the life and legacy of this saint. A Colm Cille website contains related works developed by local school children and provides a space where end users can become producers.

The motivations for developing this product went beyond the economic and lay in a deep political desire to preserve and represent local culture in a form which would be accepted by both nationalist and unionist communities in the North and would rival the quality of cultural artefacts produced by Disney or Microsoft.

> . . . you see a local story . . . turned into as good as, if not better than a Disney cartoon . . . to me that could have a tremendous cultural affect . . . that will make people . . . more sophisticated in their appreciation of their own culture. . . . Because if they are seeing the representations of their culture on . . . the back of an old photocopy . . . compared to Hollywood representations costing 50 billion dollars, obviously that must create a loss of cultural identity and a loss of culture. (Brendan, historian)

A second but related motivation was the desire to stimulate local economic and cultural regeneration after decades of civil unrest and in a city of high unemployment. Thus the organization set about attracting funding for both multimedia productions and multimedia training programmes which would enable them to both train workers in new skills and then provide them with jobs. The growth from a group of friends who formed a music co-operative in 1988 to an organization whose short film received an Oscar nomination in 1998 and which employed 22 full time staff would appear to suggest that this strategy had largely succeeded.

The Nerve Centre's logo is a hub, like a neuron, around which various tentacles circulate. It encapsulates the nature of the centre where separate media production centres come together to work on collaborative projects. Thus video and music producers may collaborate on productions while the animator may enlist the services of the multimedia programmers to convert his or her ideas into 3D.

The *Virtual Museum of Colm Cille* was such a collaborative project, which called upon the skills of many of the different media centres during its production cycle. It also required the input of expert historians and local authorities and thus was produced very much with local co-operation. Indeed, having produced a short pilot of the project they received funding through Co-operation North and from the Special EU Peace Programme. Thus the cease-fire and the desire by local and international bodies to foster economic and cultural regeneration in Northern Ireland shaped the nature of this project.

The production has been ongoing for the last three years. The team, while simultaneously working on other commercial projects, has been keen to develop a product of the highest standard both aesthetically and in terms of depth. Thus they upgraded their technical facilities during this period and decided at a late stage in the production process that additional content was needed to add depth to the product. Unlike more commercial projects the final deadline has been moved to accommodate these design and production changes, and to take account of feedback from workshops conducted with children and teachers.

During this production period a number of workshops and user-sessions with young people and teachers enabled this project to investigate how appropriate the design strategies of the organization were and how the configuration of the end user in cultural and other terms related to actual end users. During these sessions users were recorded using and talking about the product.

It was apparent from these sessions that young people were more literate and conversant with new media technologies that were the older age groups and teachers. However, they were not as technically competent as the designers of the CD-ROM seemed to think. Problems were encountered by all ages in terms of navigating through the museum, using the mouse and understanding what might be considered commonly used and familiar software icons and symbols.

Designing a product for all age groups meant that the designers tried to strike a balance between novel and familiar forms: the familiar newspaper/magazine forms and the innovative 'MTV-style' forms. In general the younger group were more enthralled by the newer forms, like 3D animated spaces and the ability to manipulate objects on screen. Older people were less impatient with reading the information in a book-like style and watching the documentary-style video inserts while they also admitted to enjoying the novelty of the newer forms.

The designers were less conscious of writing for a particular cultural market and trying to establish the cultural codes of that market. Instead they unconsciously adopted a 'reflexive user' approach to content design

inscribing their own cultural capital into the design and content of the piece. However an examination of the text highlighted how culturally coded it was. Local accents and well known local actors were used in voice-overs, the music ranged from traditional Irish to local and international contemporary music, the video and still footage focused on local places, while even the 3D animations were based on photographs of local places and artefacts. Consciously the designers were concerned about the 'look' of the piece, its 'usefulness' and the 'impression' it made.

End users from the local area meanwhile encountered no problems in terms of understanding the visual or textual language used, as had been encountered in the Compuflex case. They were engaged and favourably disposed towards the content and despite the fact that the content was based on local history and folklore much of it was new to both the children and the teachers.

The overriding impression that emerged from the user sessions was the 'strangeness' people felt in seeing local culture, places and people represented on this new media form. This reflects the lack of locally produced broadcast and new media content more generally.[12] All of the children and teachers reported that the only CD-ROMs they had used in schools were titles produced in the USA, mainly by Microsoft. None of the teachers involved from the Republic of Ireland had any Irish produced titles of relevance to the Irish curriculum. Discussions with those responsible for new media content in the Republic of Ireland's primary and secondary schools indicated that there was insufficient funding available to support such content developments.[13]

This case points first to the important role that shared cultural codes can play in the design and acceptance of a radically new media form. A combination of unconscious knowledge combined with conscious feedback from end users contributed to the design of a product which appeared to successfully represent and preserve aspects of local cultural identities.

Second, the case points to the lack of political or market incentives for the production of CD-ROM products which addresses particular and minority cultural market. Feedback from children and teachers suggests that the global economics of production and distribution translates into a limited range of CD-ROMs which are usually produced in America and are only of general rather than specific use to schools in an Irish context. The lack of home-produced titles also suggests that the cost, and length of time it takes to produce high quality content for CD-ROMs is prohibitive for small indigenous multimedia companies. The *Virtual Museum of Colm Cille* was made possible by funding from an EU Programme for Peace and Reconciliation, a special programme available only to companies in Northern Ireland and bordering counties.

RTÉ AND NUA: THE DESIGN OF ONLINE CONTENT FOR IRISH USERS

Multimedia is increasingly becoming synonymous with the internet. It has also been suggested that unlike production for CD-ROMs, production for the internet can be done by anyone with a PC, appropriate software and a modem. While companies like Compuflex may invest millions in developing technologies and content for the internet they are competing with small start-ups and individual producer/end users who have equal access to the infrastructure. The internet is seen as frontier territory where small start-up companies can compete on an equal footing with large established multinationals and where innovation thrives.

The internet is also seen as a space where everyone can actively and equally participate in a more democratic manner and either, or simultaneously, as producers and consumers. Unfortunately these are ideals and the reality is much more complex and not so positive. In reality local production for and access to the internet is still shaped by particular political, economic and social formations and the dynamics of global capitalism and neo-liberal politics. As information increasingly becomes commodified, constructing and maintaining one's cultural difference in the new online environment may become conditional on one's computer literacy and wealth.

In the Irish context there is little reliable information available on computer penetration and internet usage. However the information which exists does provide some indication of the small size of the Irish market and the concentration of end users in high earning and younger age categories. This trend can be related to the high cost of internet connections and the per minute usage charges levied by internet service providers and are in sharp contrast to patterns of development in the USA, Scandinavia and the larger European countries (Williams and Slack, 1999).

> The number of Irish people accessing the Internet from home is significantly behind the rest of Europe . . . at the moment 300,000 people in Ireland use the Internet, but two thirds of these are through the workplace . . . the Irish internet users has been identified as a powerful consumer, with 71 percent falling into the biggest spending ABC1 category, and a third owning credit cards . . . at the same time the online surfer tends to be young, single and living in urban areas. (Lyons, 1998)

While initiatives like the government's Information Age Schools Project has meant that all primary and secondary schools will soon be connected to the internet and have at least one computer public initiatives have done little to support the production of relevant content or promote the use of ICTs in other sections of the community. A study of voluntary and community organizations between 1996 and 1997 in Ireland found that many organizations experienced extreme difficulties using ICTs in their political

activities. In particular income levels, the availability of computer training and of technical support influenced their use of new online technologies. Thus, while organizations with incomes over 100,000 IRL pounds were likely to have an email address and sophisticated technologies, other community groups, particularly womens' groups, relied on traditional media (O'Donnell et al., 1998; Trench and O'Donnell, 1997). Cost was a significant barrier in these cases preventing the use of computer equipment and access to the internet.

In the context of these observations producing online content for such a small Irish domestic market and an unsubstantiated diaspora requires motivations which go beyond the purely economic. The final two case studies decided in late 1995 to develop online services whose content was derived from both historical and contemporary Irish culture and were aimed at users who were interested in Irish culture. Both of these cases illustrate that the prioritization of content over technological innovation and the embodiment of user and cultural specificities into the design of new media can be successful design strategies. At a formal level this meant keeping the design complexity, and thus the memory load of their pages, to a minimum in order to reduce online charges for Irish users. This also prompted a design strategy which concentrated more on developing communications facilities like email, bulletin boards and messaging services rather than developing highly complex content. At the level of the content itself they offered unique content which no other media operation in the world would offer.

RTÉ

Radio Telefís Éireann (RTÉ) is the national monopoly broadcaster and largest producer of audio-visual programming in the Republic of Ireland (Kerr, 1997). Established initially as a radio broadcaster in 1926, it was imbued with public service ideals from the start, which included assisting in the development of an Irish national culture. Modelled on the British Broadcasting Service (BBC) the service was, and still is, funded by a mixture of license fee and advertising revenue. Today RTÉ transmits two television stations and four national radio stations. The services are provided by a terrestrial distribution system to houses throughout the Republic of Ireland with spillover into Northern Ireland. In addition the organization sells packages of Irish programming to countries with large Irish emigrant populations like the USA, the UK, Australia and New Zealand.

Broadcasting mainly in English the company has to compete with global operators like the BBC, SKY and CNN while depending for survival on a small advertising base and license fees from only 100,000 homes. While home produced programming is consistently popular in the ratings, global economics dictates that the purchase of foreign produced programming is

increasingly a necessity for the organization. Foreign produced programming currently constitutes over 70 percent of programming. The broadcaster has consistently highlighted the increasing competitive, economic and technological pressures it operates under, which act to undermine its public service and cultural obligations.

> [The Authority in its programming] must be responsive to the interest and concerns of the whole community, be mindful of the need for understanding and peace within the whole island of Ireland, ensure that the programmes reflect the varied elements which make up the culture of the people of the whole island and have special regard for the elements which distinguish that culture and in particular the Irish language. (Ireland, 1976)

> RTÉ provides an affordable and universally available service on radio and television and a wide range of programmes produced and presented from an Irish perspective. The core element of its public service remit will continue to be:
>
> - programmes reflecting the pluralism of Ireland's cultures, including the Irish language and its associated cultural expressions . . .
> - high quality programming for majority and minority interests. (RTÉ, 1995)

During 1996 an RTÉ Online department was established and by 1997 it had become an important space via which the organization could communicate with the geographically and temporally dispersed Irish overseas. The Online department consisted of three people; a journalist, a designer and a technical operator who together were responsible for the overall look and content of the site. Many of their online skills were learnt on the job and in collaboration and consultation with producers in Europe and the USA.

Like any online product the look and content of the RTÉ website evolved over time but primarily it was designed with an Irish audience and public service ideals in mind. The site provided information on the organization, programmes and personalities and was designed using the corporate colours and logo. Initially pages were kept below 10K to keep download times fast and designed without frames or animations in order to work with any browser and without plug-ins. Additional features allowed end users to stream audio from popular radio shows and respond to these shows, facilities which were not available by any other means abroad. Clearly the design strategy was informed by a desire to create a sense of community by drawing on the familiar and making this available to users around the globe.

The site also provided a direct link to the Aertel teletext news service and it was this aspect which proved to be one of the most popular initially. Providing breaking news which was specific to Ireland but clearly of an

interest to the Irish abroad gave the site a competitive advantage over other media who were tied to programming schedules and 24-hour printing cycles.

> RTÉ, how do they compete? Well . . . over the last few days, our breaking news of the North . . . that's the wonderful thing about the internet, you can have a small company yet have a big, a very big presence on the web . . . I don't think anyone competes on the internet, everybody just produces for it and tries to identify an audience and tries to attract them. (David, online journalist)

By early 1998 the site was getting 80–125,000 hits a day rising to 1 million for events. 60–70 percent of these were from outside Ireland: mainly the USA, followed by Australia, the UK and Japan. Associated sites were also developed to coincide with the Gaelic football and hurling championships, the Eurovision, the Irish elections and musical events. The main corporate site was redesigned and re-launched to incorporate a slightly more complex design and keep up with online fashions in April 1998; but the core elements like Aertel remained. The redesign was part of a new corporation wide strategy aimed at explicitly incorporating the online department into all areas of the broadcasting service.

> Well the existing remit was to serve news and information to people outside Ireland that were beyond the terrestrial reach or the reach of our terrestrial transmitters. The new remit will be to integrate tighter with RTÉ's operations in every aspect. We're gonna start with TV and radio and say okay all TV shows will have a web presence and those that have the resources to have their own special showcase sites which will be up to date and the URL will be run with the show. . . . (David, online journalist)

Clearly RTÉ has had to respond to the competitive threat from global media organizations by developing a new means of extending its audience and exploring new revenue possibilities. The online service has developed within this context and while initially cross-subsidized by other activities in the organization it is unlikely that it can continue indefinitely in this manner. In the meantime the design strategy has successfully capitalized on the organization's unique identity, access to unique content and extensive experience of communicating with an Irish audience. The web site has developed as a space, not with the very latest in online technologies, but where Irish people can go to share in certain cultural texts and events or interact in real or delayed time with other users.

NUA

While the RTÉ project largely targeted computer users in Ireland and abroad the Local Ireland project initially attempted to engage rural users with little or no computer knowledge in the creation of content for their

online service. In a genuine attempt to go beyond the centralized structures of traditional media companies the objectives of this project were to establish locally controlled co-operative structures which would empower local communities with the tools, equipment and competencies to both digitize and develop locally relevant content. Local in this case meant parish and county level. There are 26 counties in the Republic of Ireland and six in Northern Ireland.

Nua was established in 1996 as an internet consultancy specializing in website development for corporate customers. In their first year the company website won a best overall design award from the European Commission. After the award their director was quoted as saying 'one factor in winning the award may have been the "strong Irish identity" of Nua's site. "Our overall design blends Irish imagery with state-of-the-set design techniques, giving a feeling that embodies both the old and the modern" (*Irish Times*, 1996). From the outset it was also innovative in its approach to marketing and developed a strong focus on developing online communities of users by providing free information services. Their free newsletters distributed by email had a reported subscriber base of 100,000 by 1998. By 1998 they employed 24 full-time employees.

Local Ireland was a concept developed by the director of Nua. Driven by an uncompromising belief in the internet he wanted to develop a 'brand' on the web where people from Ireland and people interested in Ireland, particularly emigrants, could go to post messages, gather information or read news. The brand was to serve therefore as a gateway into Irish culture. Drawing upon real geographical boundaries the site was to provide a taxonomy of all things Irish searchable by keyword and location. The key design concepts used were content, community and commerce, with the first two, over time, providing the market for the latter. The driving motivations were to preserve Irish cultural resources for Irish people while eventually capitalizing economically on them.

> Virtual Ireland is about creating an Irish cultural and commercial computerised infrastructure which will be accessible on the Internet . . . or whatever platform is best suited to reaching a world-wide on-line audience. It will aim at *allowing Irish resources to be located* to their maximum advantage, setting the primary objective of becoming the place that every on-line customer will want to visit when they are looking for something Irish. . . . If some sort of Virtual Ireland is not created then very soon the best Irish resources . . . will be 'cherry-picked' by the on-line worlds of Microsoft Network, America On-line, CompuServe . . . we also create the potential for a truly global, unified Irish marketplace and cultural space. To tap 10 per cent of the Irish overseas will be to create a market twice Ireland's. (McGovern, 1995)

Utilizing funds earned from their commercial work and a small investment by the national telecommunications operator, from 1997 the company set-

out to develop software tools and structures into which end users could enter locally relevant content. This process however faced numerous unforeseen barriers, from technical to managerial. During 1997/8 the project went through a number of project leaders and content developments at a national, rather than a local level.

The distinction between the national and local levels of content is important to understanding how the Local Ireland site has developed. Local Ireland designers and journalists in Dublin developed nationally relevant and more general information. Local content was to be developed by locally based co-operatives. While significant developments took place in the former, the latter developed in a much slower and haphazard manner. Without funding and management the enlisting of local volunteers was uncoordinated, usually piggybacking on EU projects or local community groups. The lack of funding, training and computer support has already been highlighted as a barrier to the use of ICTs in local community groups in Ireland. It was not therefore surprising that after two years only four co-operatives existed and these had no financial resources, little equipment and little content on their webpages. The information society vision of individuals in rural locations being enabled by new ICTs to participate in global content production is severely damaged by the evidence of everyday activities on the ground.

Nevertheless the design strategy for Local Ireland was clearly to design a space which was created for and by Irish people, and could be used by Irish people at home and abroad to actively recreate and engage with Irish culture, history and identities. Even at the level of the interface there are signs which connote Ireland. The Local Ireland home page for example is light green with a very simple, Celtic-inspired logo and a banner reading: 'Localireland . . . a local heart with a global beat'. Beneath the header a news editorial changes daily, an important aspect of the site specifically designed so that people are encouraged to constantly return. The text is usually light and humorous in style. The front page also contains a quote of the day, a recipe of the day and links to Irish national and provincial papers on the web.

However other features clearly capitalize on the unique attributes of this online medium. One can search by broad category, for example, history, and by geographical region. The communication/email sections consist of numerous services which have been given Gaelic names. Thus one can subscribe for free to *Local Litir*, a newsletter on literature events, or email vocal@local, a chat area with over 70 discussion boards including many where people can search for their ancestors. The use of video and audio on the site is again limited, as with the RTÉ site, so the pages download very quickly. Affordable and effective use for end users clearly informed the design strategy.

> I don't think that the whole video, audio, and to a certain extent even images is feasible at the moment just because of the bandwidth and that's the reason that it's focusing more on text. One of the things that people who are interested in the Internet tend to forget is . . . what it is like getting stuff down over a modem. (Mel, project manager)

The hypertext links on the title page lead the user to the second level and individual county pages. These pages are again presented on a green background and the same logo and banner are used to ensure continuity and branding. Beyond this level each page is unique at the level of page layout and the categories of information which reflect the diverse resources of each county and the existence, or not, of a county co-operative. At the time of writing the depth and quality of each county's pages varied greatly.

By late 1998 it was announced that the main telecommunications operator, Telecom Eireann was investing £4 million in Local Ireland and while the Local Ireland team would maintain control over the design and content of the site the presence of this major investor substantially changed the nature and ambitions of the project. The funding was explicitly ear-marked for the development of software tools and while regional officers were hired to help develop the co-operatives they received no funding towards equipment, training or resources. It remains to be seen if commercial motivations act to marginalize the original objectives. The announcement that the co-operatives were to changed into Information Standards Bodies signals that this indeed might be the case (Treacy, 1999).

CONCLUSIONS

Sherry Turkle in her analysis of networks and new virtual spaces (1997: 15) argues that we can construct our personal identity and sense of ourselves in new digital spaces: '. . . in the machine generated world of MUDs I meet characters who put me in a new relationship with my own identity'. James Carey (1992) argues that this process is nothing new, what has changed is merely the scale and means by which these communications take place. New media are a potential new means of communication and may enable people to both extend and preserve cultural and other identities.

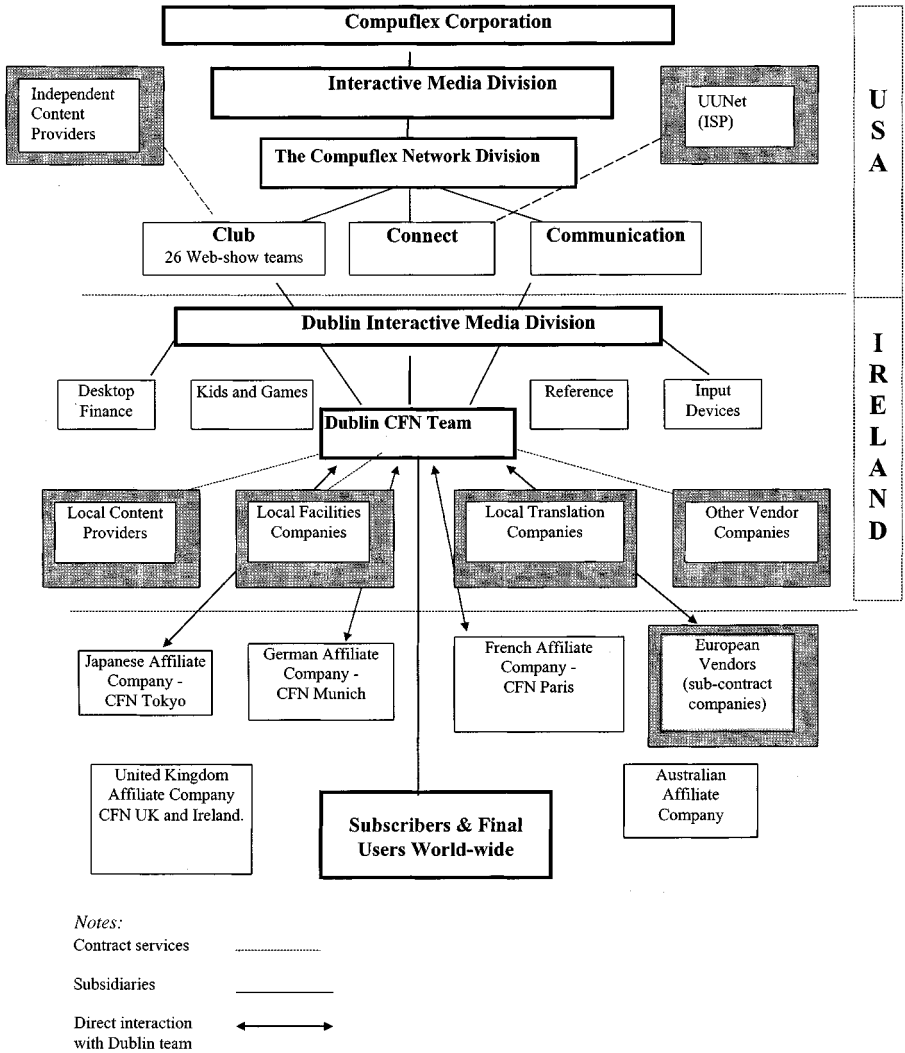
In the Irish case socio-historical trends have meant that there has always been a need to keep in contact with emigrants abroad in order to maintain mutual cultural identities. New media, particularly online media, offer a cost-effective and fast means of doing this in comparison to other methods. Or do they? In the Irish case the use of new media has been limited to a small segment of the entire population and developments have been hampered by production costs and fears about the technical difficulties involved. Why in a country noted for its production of high technology goods and services do these fears and barriers exist?

In order to answer this question one must look at the wider socio-political context and examine how multimedia industries have developed in Ireland. In the first instance the Irish IT and software industry is marked by the prevalence of foreign owned multinational companies who locate their distribution, localization and sales teams in Ireland but who concentrate on developing products for foreign markets. Second, the state has historically not invested in universal access programmes which would make the technologies, skills and knowledge of how to use these tools available to all groups of society. The consumption of the internet in Ireland has been marked by its concentration in a small, young, urban, male and relatively wealthy group.

Combined with these user issues production costs were a further barrier for the four case studies examined. These cases illustrate how difficult it is to justify producing certain types of cultural products for small markets when the prevailing political-economic discourses favour the global dissemination of standardized content. In relation to the diversity of content being produced for new media the findings therefore are not positive. Compuflex was clearly not interested in producing content for minority cultures while it did recognize the importance of locally produced content as a means of attracting audience share. RTÉ justified its investment in online production in public service terms and the Nerve Centre acquired special EU peace funding to enable production to proceed. Local Ireland after nearly three years has still not achieved its ambition of empowering local co-operatives to produce their own content. Significantly from a production and design point of view all of the companies found that in order to seduce end users in particular contexts into using new technologies they needed to design content which was meaningful and culturally appropriate to that market.

At the same time there has clearly been a more general shift in the development of multimedia content for the internet. This shift manifests itself as a shift away from complex and bandwidth-heavy content and television-like programming to an emphasis on transactional and communications services. Despite the information society rhetoric this shift is perceived by governments funding bodies and agencies purely in commercial terms and in relation to the production or localization in Ireland of internationally traded services based on standardized content. It has not been accompanied by any increased understanding of multimedia as cultural form with an important role to play in constructing and reconstructing cultural identities. Again one finds that multimedia content is viewed as 'information', as culturally and historically undifferentiated bits transmitted in a linear fashion from producer to user. Attempts to develop a more complex appreciation of the nature of multimedia content and its potential role in reconstituting and reconstructing cultural identities are few.

In Ireland the complex interaction of numerous global and local factors is creating an information economy rather than an information society.



• Figure 1 Map of production network for the CFN service, 1997

Acknowledgements

The author would like to acknowledge support from the Human, Capital and Mobility programme and UNU/INTECH, the Netherlands (1995/96), COMTEC and the Targeted Socio-Economic Research programme (1996–98) and from Dublin City University (1998/99). This article is a revised version of a paper presented at the UNESCO/COMPA International Conference on Media and Diversity, Paris, 18–19 June 1999. The case studies on which this article is based can be found on the Social

Learning in Multimedia website. See http://www.ed.ac.uk/~rcss/SLIM/SLIMhome.html

Notes

1 A survey of multimedia definitions in 1996 found that the distance education centre in University College Dublin considered broadcasting television programmes and receiving questions from the audience via fax, telephone and email as multimedia. An electronic database developed by ArtHouse in Dublin defined performance art pieces using multiple media as multimedia.
2 In the Irish case emigration has been a unique part of the country's socio-cultural history for the last hundred years and is recorded in folklore, song and the activities of Irish communities abroad.
3 This challenges traditional linear innovation and communications models developed within economics, sociology and communications studies.
4 Ireland has also experienced the negative side of foreign direct investment with companies leaving Ireland in favour of cheaper labour alternatives, e.g. Motorola, Fruit of the Loom.
5 All names have been changed for reasons of confidentiality in the Compuflex case.
6 There were six market versions of the CFN service in 1997 and four language versions: English, French, German and Japanese.
7 Figure 1, at the end of the text, illustrates the geographical spread of CFN producers at this time.
8 Clearly the US designers were designing for American users who were paying much less for online access.
9 One interviewee remarked that the Spanish market might be a more accessible market for CFN given their willingness to consume American films and television programmes.
10 All three had received funding towards other activities they were engaged in.
11 Ireland's Information Society Strategy was launched in 1997, a year after these four projects went into development. Government agencies started to investigate the potential of multimedia and the internet in 1996/7 and defined them as part of the software industry rather than as media industries.
12 This is even more extreme in the context of censorship imposed during the 'troubles'.
13 Personal communications with M. Halissey, March 1999, National Centre for Technology in Education, Dublin City University.

References

Adorno, T. and M. Gurevitch (1977) 'The Culture Industry: Enlightenment as Mass Deception', in J. Curran (ed.) *Mass Communication and Society*. London: Edward Arnold/Open University Press.

Carey, J. (1992) *Communication as Culture: Essays on Media and Society*. London: Routledge.

CEC (1994) *Europe and the Global Information Society: Recommendations to the European Council* (Bangemann Report). Brussels: European Commission.

Central Statistics Office (CSO) (1996) *Statistical Abstract*. Dublin: Stationery Office.

Clancy, P. (1995) 'Education in the Republic of Ireland: The Project of Modernity', in P. Clancy , S. Drudy, K. Lynch, L. O'Dowd (eds) *Irish Society: Sociological Perspectives*. Dublin: Institute of Public Administration/Sociological Association of Ireland.

Clark, D. (1997) 'How *Compuflex** Lost its Cloak of Invincibility while Getting Online', *Wall Street Journal*. Communications Related News, URL (consulted 5 Nov. 1997) http://www.benton.org/News/(*name changed for reasons of confidentiality).

Edge, D. (1988) *The Social Shaping of Technology*, PICT Working Paper No. 1. Edinburgh: University of Edinburgh.

EMTEL (1995) 'The User/Producer Interface: A Position Paper', unpublished paper for the European Media and Television in Everyday Life Network.

Featherstone, M. (ed.) (1990) *Global Culture: Nationalism, Globalization and Modernity*, a *Theory, Culture & Society* special issue. London: Sage.

Friedman, T. (1995) 'Making Sense of Software: Computer Games and Interactive Textuality', in S. Jones (ed.) *CyberSociety: Computer Mediated Communication and Community*. Thousand Oaks, CA: Sage.

Golding, P. and P. Harris (eds) (1997) *Beyond Cultural Imperialism: Globalisation, Communication and the New International Order*. London: Sage.

Golding, P. and G. Murdock (eds) (1997) *The Political Economy of the Media*. Cheltenham: The International Library of Studies in Media and Culture (An Elgar Reference Collection).

Hanssen, L., N. Jankowski and R. Etienne (1996) 'Interactivity from the Perspective of Communication Studies', in N. Jankowski and L. Hanssen (eds) *The Contours of Multimedia: Recent Technological, Theoretical and Empirical Developments*, pp. 61–73. Luton: John Libbey Media.

Ireland (1976) *Broadcasting Authority (Amendment) Act*. Dublin: Government of Ireland.

Irish Times (1996) 'Irish Company Wins Web Award', URL (consulted May 1997) http://www.irish-times.com

Information Society Steering Committee (ISSC) (1996) *Information Society Ireland Strategy for Action*. Dublin: Forfás.

Jankowski, W. and L. Hanssen (eds) (1996) *The Contours of Multimedia. Recent Technological, Theoretical and Empirical Developments*. Luton: John Libbey Media.

Jones, S. (ed.) (1995) *CyberSociety: Computer Mediated Communication and Community*. Thousand Oaks, CA: Sage.

Jones, S. (ed.) (1997) *Virtual Culture. Identity and Communication in CyberSociety*. Thousand Oaks, CA: Sage.

Kerr, A. (1997) 'The Development of Multimedia in Ireland', report for the Social Learning in Multimedia Network, Dublin City University. URL www.ed.ac.uk/~rcss/SLIM/SLIMhome.html

Kerr, A. (1999) 'The Development of Multimedia in Ireland', in R. Williams and R. Slack (eds) *Europe Appropriates Multimedia: A Study of the National Uptake of Multimedia in Eight European Countries and Japan*, pp. 215–78. Trondheim: Norweigan University of Science and Technology.

Lyons, M. (1998) 'Irish Internet Home Users Lagging Behind EU Average' *The Irish Times*. URL (consulted Oct. 1998) http://www.irish-times.com/irish-times/paper/1998/1012/fin8.htm.

McGovern, G. (1995) 'Virtual Ireland: A Market on the Global Networks?, *The Sunday Business Post* (date???author query): 8.

McLuhan, M. (1964) *Understanding Media*. London: Sphere Books.

National Telecommunications and Information Administration (NTIA) (1993) *The National Information Infrastructure: Agenda for Action*. Washington, DC: NTIA.

Neale, S. (1985) *Cinema and Technology: Image, Sound, Colour*. London: British Film Institute.

O'Donnell, S., B. Trench and K. Ennals (1998) *Weak Connections*, final report of the research project The Voluntary Sector in the Information Age. Dublin: DCU and the Inner City Partnership.
OECD (1997) *OECD Economic Surveys - Ireland*. Paris: OECD.
Radio Telefís Éireann (RTÉ) (1995) *RTÉ Response to the Government's Green Paper on Broadcasting*. Dublin: RTÉ.
Sreberny-Mohammadi, A. (1996) 'The Global and the Local in International Communications', in J. Curran and M. Gurevitch (eds) *Mass Media and Society*, pp. 177–203. London: Arnold.
Treacy, N. (1999) *Address by Mr Noel Treacy, TD, Minister for Science, Technology and Commerce, at the Official Launch of the Local Ireland Standards Body*. Dublin: Department of Enterprise and Employment Press Office.
Trench, B. and S. O' Donnell (1997) 'The Internet and Democratic Participation: Uses of ICTs by Voluntary and Community Organisations in Ireland', *Economic and Social Review* 28(3): 213–34.
Turkle, S. (1997) *Life on the Screen: Identity in the Age of the Internet*. London: Phoenix.
Wajcman, J. (1991) *Feminism Confronts Technology*. London: Polity Press.
Williams, R. (1974) *Television: Technology and Cultural Form*. London: Fontana/Collins.
Williams, R. (1996) *The Social Shaping of Information and Communications Technologies*, PICT Working Paper. Edinburgh: University of Edinburgh.
Williams, R. and D. Edge (1992) *Social Shaping Reviewed: Research Concepts and Findings in the UK*, PICT Working Paper No. 41. Edinburgh: University of Edinburgh.
Williams, R. and R. Slack (eds) (1999) *Europe Appropriates Multimedia: A Study of the National Uptake of Multimedia in Eight European Countries and Japan*. Trondheim: Centre for Technology and Society, Norwegian University of Science and Technology.
Winston, B. (1996) *Technologies of Seeing: Photography, Cinematography and Television*. London: British Film Institute.

APHRA KERR is a research officer based in the research centre COMTEC, part of the School of Communications at Dublin City University, Ireland. She is also a lecturer on the MSc in Multimedia programme at the same university. The research that this article draws upon formed part of her PhD thesis, 'Ireland in the Global Information Economy: Innovation and Multimedia "Content Industries"' which was approved in late 1999. The article also draws upon research conducted between 1996 and1998 for the Social Learning in Multimedia (SLIM) network, a TSER funded network of researchers from eight different European countries.
Address: School of Communications, Dublin City University, Glasnevin, Dublin 9. Ireland. [email: aphra.kerr@dcu.ie]