FAME 2010+

Forecasting the Future of Multimedia to the Year 2010 and beyond

Entertainment and the Entertainment Industry

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Introduction

Entertainment and the entertainment industries are at the forefront in the development and hype around multimedia. This is largely due to the multimedia nature of much of the production of the entertainment industry - from television to computer games, and the 'interactivity' inherent in much of our entertainment activities. The entertainment industry is also highly concentrated: wealthy and presents a very high profile, the conditions for high investment and publicity which attracts the attention of the public and analyst alike.

This paper presents evidence for three ways multimedia technology could change entertainment and the entertainment industry. First, the technical and social and psychological development of traditional technology-mediated or centred entertainment such as television, games and gaming, especially the likely increase in home based provision of entertainment. Second, changes in the entertainment supply industry with convergence and changes in the power of intermediaries. Third, how multimedia may bring new technology and commercial interests into other leisure activities.

This paper will concentrate primarily on the two entertainment 'arenas' and associated activities and technologies that are used in leisure time.

(1) Home entertainment, including networked systems (channels into the home such as VOD, 'music-on-demand', interactive TV, video games, Internet-based entertainment, 'MUDs' etc..) and stand-alone systems (games consoles, PC-games, CD-I etc..).

(2) 'Public' entertainment (gambling shops, lotteries, cinemas, video arcades, theme parks etc..).

Multimedia for entertainment

The convergence of technology is apparent in entertainment media - television is becoming digital, in production, transmission and reception. Computer generated effects are ubiquitous in film and television. Video games and television programmes are viewed on the same screen in the home. Sophisticated video games and other multimedia computer entertainment are increasingly using television and cinema film and techniques. In addition the themes and characters are now crossing over between video games and other media, as they have traditionally done with books and film. As important, the ideas of multimedia and interactivity are being incorporated into traditional entertainment without actually using the new technology. Digital transmission technology is also opening up new ways of receiving programmed entertainment, or creating social space for leisure activities.

The technology configurations that are most prevalent today are:

- Television and Radio

- Home video
- Video Games
- PC games and other applications
- Cinema
- Music
- Video arcades
- Telephone

To this must now be added networked systems,

- on-line services
- Internet
- Other networks

These technologies are at the centre of the development of multimedia - the convergence of computer communications and broadcast technology , both in the end user terminal, and in the production and distribution.

Important questions that need to be addressed by policy makers include:

Will the development of new technology lead to the concentration of mass market entertainment in the hands of a few companies, and is this important?
In what ways could new technology increase or decrease the sharing of entertainment in the home or in public spaces or in 'cyberspace', and what are the implications for existing providers and social cohesion?
Will interactive multimedia fragment the mass entertainment market and industry or reinforce it?
What is the role of the entertainment industry in investing in technology, service and infrastructure development?
Will the development of new technology lead to the concentration of mass market entertainment in the hands of a few companies, and is this important?

The Nature of the Sector

Understanding and predicting the adoption and impact of multimedia in the home into the future requires some insights into the social and cultural functions fulfilled by publicly-provided entertainment, to understand the degree to which it can and might be replaced by alternative private and personal delivery mechanisms tailored to the needs and demands of smaller groups of individuals. We also need to understand at a more sophisticated level than hitherto attained by economists and marketers, who have a professional interest in predicting consumer uptake of multimedia in the

home: (1) how the current socio-cultural and socio-psychological patterns of behaviour in the domestic setting will influence the uptake of new technologies, and; (2) (from the opposite perspective) how the 'domestication' of new technologies will affect existing patterns of behaviour in the home[1] and community.

Entertainment itself has specific, difficult, characteristics that need to be understood in this context. What does it mean to be entertained, are there differences between entertainment and leisure, and can other areas of life such as work and education by classified in some way as entertainment? This overlap of entertainment is important, given the skills, technology and techniques that can be applied to make non-leisure activities, products and services entertaining. Multimedia challenges some of the accepted boundaries and definitions of entertainment both at a personal and commercial level.

The Entertainment Industry

The entertainment industry is a broad term that includes the mass media: television, radio, magazines and newspapers; the sport industry; gambling and gaming; the tele-visual and music production industries; theatre and cinema; and places of entertainment such as pubs and clubs. The broad scope of these industries rules out any detailed analysis of technical and business developments in all of them, so a few will be outlined.

Television

Television is the most successful cultural technology and entertainment media ever - television reaches 78% of the UK population daily and 94% weekly[2]. Television can be used to deliver information, education, and entertainment from sports and game shows to films and soap operas. Technically and commercially it can be analysed in terms of production, transmission, finance and reception, but any sophisticated understanding of how television could evolve relies on understanding its cultural dimension.

After initial small scale local broadcasting service, the television industry developed as a centralised mass media around a small number of national, state or private stations producing the broadcasts, with a free market in consumer receiving equipment. The development of cable TV and satellite in the 1970s and 80s upset that balance, and led to the development multichannel TV. In this time there has also been a proliferation of TV production studios.

Television is funded from public and private sources. Public service broadcasting, funded by government or licence fees often has a remit for information and education in the public interest, and to promote and preserve national cultural values. Private funding is largely from advertising (advertising spending on TV was 151119 ECU in Europe in 1994[3] in 1991 in the UK £2,303 m of which 90% went to the broadcasters), and traditionally this revenue has gone to programmes and channels that produce the largest audience. This is usually entertainment - sport, Hollywood films and mass appeal sitcoms, soaps, games shows etc., although broadcasters are obliged to provide 'public service' material.

The development of multiple channels has divided the advertising income, putting pressure on production quality. However this trend has also increased the possibilities for targeting advertising and niche programming, and has undermined the position of the broad-appeal channel, creating the conditions for further exploitation on new technology and new services to target programming. Cable created a trend towards pay-TV, funded by the consumer, and this is successfully applied in broadcast and satellite TV , on subscription services. More recently there have been experiments in pay-per-view (e.g. the Tyson-Bruno fight in the US and UK) which has not been proven commercially in Europe at least.

The traditional television industry is in a period of rapid change - the market is largely saturated, advertising revenue is increasingly divided, subscription 'entertainment TV' from satellite is taking advertising revenue and driving up the prices of the most popular programmes such as of sports events and films, and there are increasing pressures on public broadcasters to seek private funds. 'Networked' or terrestrial TV is thus having difficulty maintaining the quality that the public wants, creating a vicious circle as audiences leave for other leisure pursuits or pay-TV.

The production technology has developed considerably in recent years with the introduction of digital technology, and the television industry is the principal user of high-end multimedia technology.

The consumer technology has been provided in an open market, and as with much consumer electronics, design and construction has moved to Asia from the USA and Europe. Consumers tend to buy televisions and VCRs, but different models have emerged for cable and satellite TV - in the UK the satellite receiver is bought by the consumer, but under regulation, in the US rental of the cable set-top box is a major source of income for the CATV companies.

The television receiver's only major technical development was the introduction of the video recorder, with a high penetration in Eurpean homes(over 50% up to 80% in the UK) the home computer and games console are not strictly television and are considered elsewhere). Other developments, such as mini-television, high definition, wide screen have not been successes. The quality of video television is much lower than that of broadcast TV, but the benefits that it brought far outweighed this factor. The video recorder enabled three important new developments in the use of the television. 1. Time shifting of programmes, breaking the dependence on the broadcaster's timetable (about 3% of total viewing); 2. pre-recorded video sales and rental - the television programme entered the publishing market with the rental or purchase of films (66% of UK's £1.8bn film market is video sales and rental, the European market video retail market is 4.8bn ECU (1994)[4]), television series, but also self help videos, hobby videos etc.; 3. home video with the slightly later development of the domestic video camera[5] . These new uses are important for looking at the future of media - they all increased the choice and possibility for individuals and groups to use the television in more self-defined ways. In commercial terms, it enabled the development of a new market in video products from pornography to exercise courses, and started a market in non-professional video products.

Another development of television that has not been quite so widespread, but could be important for the development of multimedia is Videotex. Where this has been a free service, such is in the UK, it has become standard on many TV receivers, and despite the clunky interface, it is very widely used (over 20m users in the UK). Again it is a technology that gives users choice, is essentially free (advertiser supported), and is simple to use. Two characteristics of videotex, borrowed

from newspapers, that are now reflected in use of the WWW are the possibilities to go directly to the information that you want, without having to wait for it to be presented, and the ability to browse information.

The Television has become very important for individuals, families communities and society. Lull(1990) points out the many roles that TV can play. Not only does it provide entertainment, information and education, but it is used for many personal and interpersonal uses. For example McQuail, Blumler and Brown (1972) categorise mass media use for personal use as 1)diversion 2) Personal relationships 3) personal identity and 4) surveillance. Lull(1990, pp 36-7) identifies two categories of social use of TV. *Structural use:* Environmental and Regulative, and *Relational* : Communication Facilitation, Affiliation/avoidance, social learning and competence/dominance.

It is clear that use of the TV for entertainment is not a simple issue of watching the screen, and this has important implications for 'interactivity'. Audiences tend to interact with television programmes in many different ways: commenting on the action, using it to confirm or develop views and identities, using it to reinforce dominance within the family, using it for information on other activities. Interactive technology could change or influence many of these uses.

There are significant difference between social groups in the use of TV: lower demographic groups and older people watch much more TV than the younger or more affluent, which is proving important in the development of multichannel TV services.

Some television (following other media such as radio and newspapers) engages viewers in some interaction with the program makers - through written feedback, telephone phone -ins, and more recently Internet e-mail. The expansion of the studio audience to the television audience, through phoning in to contribute to vote is an increasingly common television device [6]. Other programmes involve the viewing audience in other ways by going outside the studio, or showing home videos.

Television entertainment raises many broader social and political issues more sharply than other mass media. How important is national television entertainment to national culture and cohesion ? What is the role of censorship, and who should have the rights to choose what they watch, and who should be protected (particularly with violence and sexual images). National models of regulation have been built up in different countries, and are being challenged by new technology which knows few barriers. Existing regulations for broadcasting in Europe are confused. For example, under EC regulations(Broadcasting Act 1990) the broadcasting not the receiving country is responsible for regulating satellite broadcasts, but Britain bans the broadcasting of pornographic television *into* the UK (case of 'Red Hot Dutch'), while allowing satellite broadcasts *to* Germany and Scandinavia. Technical fixes have been proposed for the problem of censorship - the V-chip has been adopted in the USA as a means to help parents control the what their children can see on the TV, but it is still under considerable in Europe.

The ownership of television media is also an important issue in regulation, affecting investment and innovation, and is currently going through considerable changes in the UK and Europe[7]. The control of cross media ownership is particularly important as multimedia blurs the boundaries between print and television, and consolidation of media production becomes economically attractive.

Cinema

The cinema suffered a considerable decline with the development of the television from the 1950s. However the 1980s saw a renaissance of cinema attendance, with the feature film market in the UK growing 5-fold between 1982-1993[8] , despite a massive increase in home video. [9]. The reasons for this are still unclear, even with hindsight trends cannot be understood, again a warning to the forecasters. Maybe the video industry promoted interest in the cinema, or increases in disposable income and leisure spending (for example Financial Times 12-10-95), or improvements in cinema's with increasing concentration in multiples made them a better place to be. Maybe it became fashionable to go to the cinema, or maybe films just got better - special effects that increasingly relied on new computer technology brought spectacle back to the cinema in the 1980s.

The cinema is still a very expensive way of showing entertainment, and with very different social and economic characteristic to the home video market. However the two are now closely linked: a film may make more money on the video release, and the popularity of a film in one medium is no indicator of potential success in the other.

The cinema *production* industry is an extremely important source of entertainment programming, but has a very particular features related to the economics of information: the up front costs are often huge compared to the distribution. The industry has adopted a form of promotion that uses hype, the cult of stars, and careful planned release of films to maximise audience interest and thus revenue.

The cinema film industry has been the scene of commercial activity for consumer electronics companies following the supposed theories of convergence and complementary. In the search for synergy between technology and content, following the development of new music and video recording technology, both Sony and Matsushita bought Hollywood studios in the 1980s, as did Philips. These marriages have not always been successful as the link between video entertainment and the hardware has not been a strong commercial imperative since the development of the domestic video.

Games and Gambling

Video Games

Video Games are a highly successful form of multimedia technology that brought multimedia computer technology into many homes in the 1980s and 1990s. The US market for home video games in now larger than that for films or music, and is a major force in the development of technology and public use of multimedia. Video games are also associated with amusement arcades and their culture. Video games are predominantly a youth culture phenomenon, but with ever more adults having been brought up with the technology this is broadening. It is also a largely a male pursuit, although it is not clear how much this is due to the nature of the majority of games and existing technology - violent, goal oriented, single player etc., the absorbing or Immersive nature of games, or the culture that has developed around video games. Video games have raised public issues such as addiction, isolation and health issues, as children's entertainment they are compared unfavour-

ably to entertainment activities of the past. However the rise of the home video game has been at a time of increasing insecurity on the streets, and provides a leisure activity for children confined to the home.

Video games are also a major replacement for the television for children with access to machines - playing these interactive games seems much more attractive than 'passively' watching TV. There is also an important informal culture around video games - swapping video games, club, hacking of games that has given rise to commercial counter parts, game rental, and TV programmes.

More recently new sort of games have been extremely successful. These include simulation games (e.g. Sim City) and 3D VR games (Doom, Duke Nukem), which both have highly developed, although very different forms of interactivity. - soft. Doom is also an example of a user customisable games - where those with the skills to develop entirely new graphics or scenarios for entertainment. As user interfaces are developed this may become a much easier task for users . Multi-player networked games are also popular. Multi-user games (e.g. 'Dungeons') that do not require large bandwidth have been popular since the advent of multi-terminal computers and the Internet. Games that require high speed networks are very popular in colleges and work places (e.g. Doom). However these have been restricted to those with access to institutional facilities.

A commercial war between SEGA and Nintendo boosted the market in the early 1990s, marginalising Atari etc., but was the duopoly was broken by the entry of Sony with strong technology, and the benefit of a strong marketing and a strong image. The games market is now dominated by the games, with the hardware virtually given away. SEGA and Nintendo are more associated with the characters of their games than the technology. The issue of game-play is very important with the development of multimedia technology. Leading edge graphics may get the headlines, but they cannot compensate for the underlying game-play. The future of games and multimedia may depend on video games being developed for a much broader market than the predominantly youth, and male market.

Single use games machines are now under threat from the PC, the leading edge platform - with CD and higher power - it could be the grown-ups games machine.

Public video games include the traditional arcades, but also newer games based on video technology and multimedia are becoming popular in pub. However use of electronic games in places of public entertainment is very culturally specific, a is virtually unknown in some countries.

Gambling

Gambling is one of the most popular entertainment activities, and will certainly be a premier use and innovating industry in multimedia. The gambling industry is already highly reliant on technology. Betting on sports has relied on the media to publicise events and odds, develop expectations, relay the event and the results. The telephone and computer networks are very important to betting companies and as informal networks for individuals. Modern lotteries use very advanced computer networks to process tickets and the television to promote it, and could easily be adapted for home play.

Gambling is a multi-billion pound industry world wide ($40bn alone in the US, WIRED 6/95), and is highly regulated, both on moral grounds, and to ensure government revenue.

The Internet opens up a number of possibilities.

1. As a medium for informal exchange of information

2. The technical possibility for on-line gambling

3. The development of gambling on a much wider range of events.

Regulations allowing bets to be placed over the telephone vary from country to country, as does the legality of gambling. The development of gambling based on the data networks has not been addressed by policy, but is starting to attract the interest of entrepreneurs and established gambling operators.

Home Computers

Home computers have been a source of entertainment, as a platform for games, and as a hobby type leisure activity in itself. Home computers, as opposed to Personal Computers were mass market products in the 1980s, with relatively high penetration rates. Companies like Atari, Texas Instruments, Mattel, Amstrad, Toshiba, IBM, Commodore, Acorn, Sinclair and Tandy sold machines at reasonable prices (C64 and ZX Spectrum 1982). Many long defunct companies were also present, selling machines from £80 to £2000. These machine were sold for education, home accounts and games, althogh many of the smaller machines were usefless for anything but games and learing programming. Three strands of producer emerged - the computer companies, the games machine companies, and those trying to do both things. The apparent boom and bust of this market was probably due to development of home video games that fulfilled the key functions of the home computer more effectively.

Video games for PC have been one of the driving forces behind the development of ever faster home PCs. Most domestic users would never need the power of a 486 or Pentium to do non-entertainment functions. It is virtual reality 3D graphics games that really call for this technology to move from the office to the home.

The 1990s home computer market is largely dominated by the generic PC. The Economist (23/3/96 p. 84) reported that the household penetration rate in December 1995 was 24% in the UK and 36% in the US. However the ownership is highly skewed to the better off - unsurprising given the average cost of £1500 including software. A much smaller number are connected to an on-line service or to the Internet (figures are impossible to give at the present time, as estimates vary between 3 and 25% and are changing very quickly[10]).

Unlike other consumer goods, including video games and television, the computer is much more difficult to set up, to learn to use and to develop usage. Considerable after sales support is needed for the non-hobbyist computer user, although more resilient and user-friendly software is starting to correct this. The image of the computer and the level of education needed to use it may be just as important in restricting the market as the price.

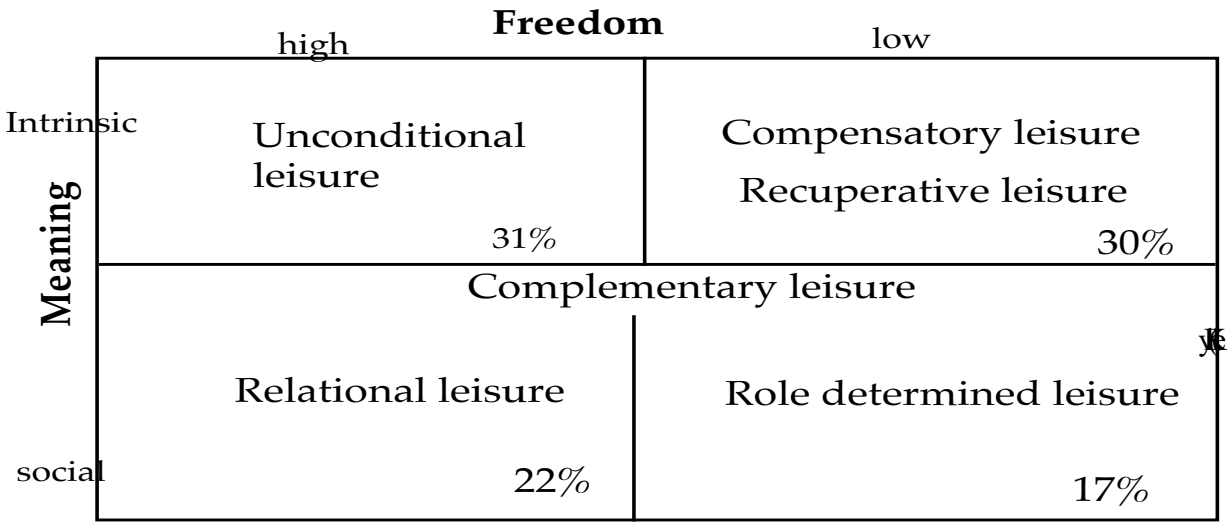
Leisure - pointers to understanding the market for entertainment.

Sociological and psychological studies on leisure and entertainment can help us to understand how multimedia could develop in use in entertainment, and fills the gap in the understanding of why users opt for certain multimedia products and not others. Leisure time is one of the central spaces for socialisation, consumption, and the formation and expression the self. Much of this time is spent in entertainment activities, but these activities are frequently peripheral to the use of the leisure time.

Leisure involves some degree of *freedom to choose*, with, however social and technical restriction on the choice of activity and on the form and context. None-the-less, the implications for multimedia are that even if people buy something, they will not use it if it does not bring them some satisfaction.

Leisure activities also have many meanings, or interpretations. Some are conducted for their own sake, there is something *intrinsic* or existential about them. Others are the context for *social activity*- the activity is complementary to the socialising.

Studies of leisure such as Kelly(1983)[11] have grouped leisure into 4 broad categories, based on these dimensions as below:



1983)

In terms of technology use, unconditional leisure could be playing a video game; Relational leisure may involve going to the pub and playing a video quiz game, watching TV as a family, or chatting on the telephone; Role determined leisure, that related to family or work duties, could include watching television, or playing with children with a electronic game ; Compensatory and recuperative leisure may be resting from work in front of the TV or in the cinema, shopping for a treat or going out for a meal . Of course many activities will combine elements for an individual, and different people will give the activities different meaning, or involve different freedoms. Indeed, the same activity can have a different position in the square at different times for the same person, and may change over time.

Leisure can be conducted alone (solitary), with close family and friends, in social groups, and as a 'mass' activity. Leisure activities may not actually be enjoyed, or may be done out of obligation to others, or in pursuit of other ends.

ICTs are already used in all aspects leisure. For example Video games in solitary or group use, with intrinsic meaning and social meaning. Video games have become hobbies [12]with social and economic activities associated with actually playing the games. Television is a prime example of a leisure technology that can be used in all the modes, and this model helps us to understand how different forms of interactivity or information access could enhance or reduce the role of TV in various entertainment settings.

Recent Developments in multimedia for entertainment

Multimedia technology and Entertainment

As with the other sectors a prime consideration is to differentiate between (1) the enhancement of exi existing functions, products and services and (2) the creation of new ones, through the introduction of multimedia technologies.

The evolution of existing forms of entertainment through the addition of multimedia technologies (1) may represent in some cases just a small incremental improvement that adds to other features of an entertainment system, or a significant leap in terms of functionality or desirability that could be defined as a new product or service (2).

Additional functions and improvements to standard consumer electronics appliances are one aspect of change. For example, better graphics, interactivity, information storage and retrieval facilities, network connectivity and on-line services are simultaneously enhancing the existing (passive) function of the ordinary TV and stretching its range of uses beyond recognition. Similarly, the incorporation of fast-access CD-ROM drives, powerful (32 and 64-bit) processors and full motion video are producing a stream of increasingly more 'entertaining' hand-held, TV and PC-based games.

New ways of distributing existing entertainment formats are enabling access to a wider range of media than was possible in the past. The evolving network infrastructures, delivery systems and interactive technologies on offer raise the possibility of a wide range of entirely new forms of networked entertainment such as gambling, interactive TV shows (such as national quiz games), multi-player and multi-team on-line games, virtual worlds and so on.

The following sections look at the technical and business development in multimedia for entertainment.

<u>The home MM terminal</u>

Apart from the television, video and telephone, there are three technologies currently in homes that are the basis for the development of home multimedia terminals: the PC, the games machine and

the cable/satellite set-top box. Video games machines have constantly outsold PCs in the US for the last 5 years[13] . Set-top boxes have taken off with cable and satellite TV, and the first digital version are being tested.

It is estimated that 35% of US households have a home PC (97 million), compared to 22% in UK (22m), 15% in Germany (30m), 13% in France (22m), 12% in Italy (20m). However the TV has a more than 90% household penetration in these countries. The multimedia revolution is seen by many as getting a sophisticated digital terminal, networked or not, into the home for entertainment, education, household business communication and information.

Attempts have been made to make the PC more like another box under the TV, for example Olivetti's Envision (£1,300) PC that looks like a video - with hard disk and CD-ROM + Win95 - hooks up to TV rather than monitor. Microsoft and other companies with investment in the PC model have until recently been keen on promoting the PC as a multipurpose platform for entertainment and other home activities.

The multimedia PC is very expensive £1000-£2000, and although 65% of families worth $100 000 or more have them they are inaccessible to most people. There is a general desire within the industry to produce a cheaper terminal, and one that is not going to be obsolete in a couple of years. In 1996 many companies, led by Larry Ellison of Oracle, a database software company, started talking about home terminals, sophisticated digital set-top boxes, or cut down computers (Internet Appliances, or Networked Computers NC) that would give TV access to the Internet and basic services, but also be a model for future distributed computing architectures over high bandwidth networks (*The Economist 14/10/95 p.106*). In early 1996 the magic price that many firms were suggesting was $500 or £500 as the maximum people will pay., by mid 1996 it was £200.

Many firms trying to produce the pieces of these boxes : Acorn Computer, Apple, Scientific Atlanta, Fujitsu, Philips, General Instruments, Nokia[14], NEC, HP, Sun, Matsushita, Toshiba. Some of these solutions are highly integrated to get a low mass production cost, but the operating system is seen as important as well. For example, Apple a have produced a cut down operating system that could be used in many different consumer electronics products. Microsoft have proposed Windows 97, a cut down operating system that will reside in a home multimedia machine that controls the TV, video and stereo as well. The development of these termainal for the home will be different to the business version, with the emphasis on functions for domestic consumption - WWW, e-mail, home shopping and banking, and will probably be linked to the development of digital television set top decoders at some stage.

In the reverse direction, some simpler consumer electronics products, such as games machines and Philips' CD-i[15] are being upgraded. These machines are quite specific, and use CD technology. By upgrading them they also offer a low cost route to network connection, and to the introduction of CD ROM to the home. SEGA machines in Japan can be connected to on-line services to check stock market prices, and play games.

Not all companies have taken this route - Sony made their games machine purely for CD based games - so as not to confuse the technology development and the market, and to keep the price down so they could profit from the software. This is a common strategy in the games market - no profit is made form a £300 pounds games machine. If this model is to apply to the general multimedia terminal, the producers are not going to make money from selling it, but from selling

the software

Video-on-Demand and Video Dial Tone

One of the principal products hyped at the beginning of the 1990s was Video-on-Demand. Instead of waiting for a channel to show a film, or going to rent a video, viewers would be able to dial up a movie from a selection - possibly a huge selection, and view it , either by downloading the film, or having it transmitted live. However technical trials, often as part of Interactive television trials quickly showed that with current technology it is probably too expensive, although the number of films that people watch increased over that of normal cable subscribers in a number of trials..

The expense comes from the technical demands. The set-top box, and the video servers cause considerable problems, due to the huge bandwidth and storage capacity required. Video -on-demand probably raises particular technical problems of bandwidth, transmission protocols and storage that are different to other interactive services. continuous stream switched video is one of the most difficult technical challenges to network designers.

Pay TV and video shops provide a service that is convenient and cheap enough that VOD will not be a success in the near future. So called Near -video-on-demand (NVOD) is likely to be more successful. The most popular films account for most rentals, and some broadcasters believe that it will be economic to use a digital broadcast system (cable, terrestrial or satellite) to transmit one of these films on a number of channels simultaneously, with starting times delayed for the convenience of viewers. Film channels currently show the same films every few days, this can be cut to every 15 minutes. This will certainly be one of the services offered on digital pay-per view satellite services that are currently receiving huge investment by companies such as News Corp. and Kirsch group. While this may be economic, this may undermine the cinema as the traditional first distribution outlet.

Interactive Television

Interactive Television is still one of the more powerful visions of the entertainment industry. The full service network was a vision of technology that would be all things to all people. i-TV would deliver television, other on-line service such as games, e-mail, video conferencing, shopping, banking to every home that has a television. I-TV would also deliver new forms of television like entertainment - also called interactive television. Advertising show a family grouped round a telvision, enjoying games or home shoping together. This does not seem to reflect current use of television, or shopping practice for many people. More advanced versions, such as Sony in Stuttgart, suggest i-TV will be linked to home networks that give terminals in every room, but this is certainly for another generation.

Interactive television, with video on demand, offers broadcasters and advertsisers increasing flexibility in targeting consumers and linking advertisments to more direct marketing and sales. With increased feedback from viewers, and more direct follow through, operators of i-TV would be offerenig a much more valuable service to advertisers, over conventional TV, and would throw the system into confusion for a number of years.

Initial trials of the technology showed its limitations, the services developed have not been well received, and the costs have been astronomical. In addition the Internet has crept up behind the developers and offers a back door to proving many of the services, such as banking, that would have

paid for the investment in iTV and attracted customers. There is thus considerable uncertainty about its development: " We're really not sure when true interactive TV will come" James Robbins, CEO of Cox Communications Inc. (Business Week 8/4/96).

Full service networks have been developed and are being tested in many sites in the world, principally in the US with over 20 trials, but also in Canada (2), the UK (2), in Germany (3), Italy, France, Holland, Finland,, Japan, Hong Kong, Singapore and Australia. Many of these advanced trials were announced in 1993/4, but very few have had any significant success for technical, content and market reasons. Technically the technology works (e.g. Stuttgart trial, BT trial), but it is obvious to the developers that content and the market are going to be more expensive and more difficult to develop. However some of the more advanced trials such as in Lyon, are claiming significant levels of usage[16].

Most of the trials use a digital network and a specialised computer as the set-top box. Some of the trials are renting these to customers as they would do the cable TV converter, others plan to sell them if the regulators in the US approve (Business Week 8/4/96).

A number of network technologies are on trial, from ATM with fibre optics to the home in Florida and Cambridge, to ASDL, which uses installed copper cables. The different technology offer different sizes of backchannel to the customer. One version offers video dial tone to the customer, allowing them to send as well as receive any data. Most trials restrict the back channel to small amounts of data - particularly signals to control 'interactivity'.

Almost all the trials are developed by consortia of companies, each bringing relevant expertise, finance, products etc. One of the difficulties has been to develop technology and systems to satisfy all the partners, and local and national regulations. Another difficulty is the regulation of television and telephone services - with companies involved in one being forbidden to sell the other, or required to keep the financing separate.

Interactive Programming

One of the hopes of the new media is to change the nature of television programmes. Ideas include the audience voting to redirect the action in a film, to choose between various endings, to stop the action and interact with the characters, even to enter into the action of film. These developments not only depend on the technology, but on the creative efforts of film and games makers, and only audiences change the way they use television and film. There are many ways in which interactive services can run along side the television show - with polls, betting, quizzes etc. There are already a number in place, e.g. the US (NTN Inc. with 40 services and 500 000 users, mostly single male 21-44 years. 1996) and in the Netherlands on open cable channels with voting systems on political debates. Many television companies are experimenting with the possibilities of using digital side channels to enhance the programmes and provide extra information, with the possibility of 'interaction' with the data or viewers.

Nobody expects interactive programmes to take over from linear television. INteractive programmers are starting for experiments with formats that reflect the different ways tht television is used, and people intereact witht he material and with other viewers.. For example, NTN's system is primarily for use in bars, where there is an element of social game playing. Rosa Freitags interactive 'soap' focuses on the emotional bond that people develop with on screen characters. Formats

that will be successful will be those that enhance the modes of viewing or playing that specific audience groups consume. Generations effects will be very important at all levels, but we may have to wait for the younger generation to age before the full range of formats can be expoited.Internet

The Internet has become the major factor in multimedia, including entertainment in the last year. Using the Internet: surfing the WWW, using newsgroups, IRC, BBS etc. is a leisure activity in itself, it can be a hobby. It could also be seen as an extension of channel surfing. The Internet can also be a source of support for leisure and entertainment activities - information for hobbies, programme schedules, viewer groups etc . Lastly is can be a delivery channel for entertainment products: downloading games, pornography, videos, sound files.

The Internet in its current state is not very well equipped for handling traditional entertainment, such as video and music. Unlike fixed links, such as broadcast, cable TV or telephone (ISDN) the Internet introduced delays in transmission, and has a very low bandwidth capacity. Developments such as Streamworks, or Real Audio has brought real time sound, such as music and radio to the Internet, but the bandwidth needed by video is likely to limit any VOD service to poor quality. One attempt at video is through software created by Oracle Systems (WebTV) though widespread use is dependent on the development of high-speed public networks.

The PC has been the traditional means of connection to the Internet, but as discussed earlier the high price and relative complexity is seen by many as an obstacle to the development of mass-market Internet. Various hybrids are emerging, the PC is being cut down, or converted to a entertainment consumer electronics good. Another example of combining TV and PC is Intel's 'Intercast' (hardware and software costing $500 extra to the standard PC). This allows PCs to receive and combine related information from TV programmes using existing network infrastructures.

The latest development in Internet provision is cable modems - digital modems that connect to a co-ax CATV network. TCI and Cox have ordered 500 000 of these to offer TV subscribers WWW facilities on their TVs. These modems ($500 in the US, £500 in the UK) are still expensive, but offer much higher bandwidths

One of the problems with Internet on the TV is that text is difficult to read on the cheap screens. Traditional WWW pages are made with lots small text and detailed fonts. This is of course a function of the platform and the content, but a significant development in multimedia sites designed for use with a TV. It may also provide a boost to the market for the ever promised HDTV.

The Internet is a communications medium that is developing fast, and offers many possibilities for entertainment that have hardly been touched upon. The development of a real mass market of people will access to the Internet will be crucial in development of these new possibilities. The Internet can be the medium of entertainment, but is can also be the nmedium that transmits information about the latest fashions, and sustaining information for communities of interest around particular leisure pursuits. It will also bypass and shape the content of traditional media.

Shopping

Internet shopping as an entertainment is not a reality, but systems are being develop to facilitated shopping in virtual environments completely unlike real life, and in the hope the entertainment factor will encourage use of virtual malls. *c.f. Retailing study*

Socialising

Use of on-line services for social activities has become a huge phenomenon in the US, (e.g. Turkle, 1995), as on-line time is cheap and PCs are much more common in the home. No longer restricted to the young male computer 'nerd' this text-based use will certainly grow among the socially isolated, from the elderly and disabled, to the those living alone in cities and isolated geographically. Among young people, computer based communications will become part of the everyday life.

There are obvious implication for changing community and social life, but these technologies will reduce social isolation and provide new social interactions and opportunities for many otherwise disadvantaged people. It will certainly be a challenge to existing entertainment media such as television and games, which will lose audiences, but also creates new opportunities to entertainment companies to provide various environments for interaction, and the communications companies will profit from the addition desire to communication that arises from sharing other pursuits, such as games or hobbies on-line.

Gambling with the Internet

There have been a few experiments with gambling on the Internet, but they are running into difficulties with the technology and the law. One immediate problem is payment - which will no doubt be sorted out. The law and taxation is also very pertinent. Where states limit or prohibit gambling, the Internet will provide easy access to offshore gambling, through companies such as Internet Casino, based in the Turks and Caicos Islands. However this raises issues of consumer confidence and security of payment and account systems.

The Internet is surrounded by moral controversy - but there are technical developments of screen content on individual machines that are being sold to schools and families who worry about their children finding undesirable material - these may work to a certain extent to calm fears in the short term, but are unlikely to deter most young computer users! More seriously the moral issues will be important in shaping the policies controlling or shaping networked multimedia as it reaches the larger market.

On-line services

On-line services - provided by companies such as AOL and Compuserve are changing with the development of the Internet - and probably only survive due by adding extra value, and giving access to the Internet. The 'safe' environment, guaranteed by the repuataion of the company will be important for a while, but these services will be eventally replaced by those supplied over the Internet.

On-line games

There are a variety of on-line games. Early on-line games, MUD or were available on dial up services, and are 'virtual environments'. These are available on on-line service such as Compuserve. Recent developments include graphical interfaces - suchas the New York MUD on comuserve, where players define 'Avatars' graphic characters that they can move through a 3D graphical environment. More traditional video games can be played on-line. SEGA machines can be linked up in local networks or over wider commerical networks

British Telecom has recently launched (1996) an on-line gaming system, Wireplay[17], at reduced telephone tariffs. This will enable PC users to connect to other users and play network games, from chess to Doom. This is an alternative to the Internet or on-line services, and users benefit from cheap tarifs (£1.50 an hour) than if they connected to the other systems. America on-line and Compuserve, Niftyserve have had on-line games for a while - and they are very successful. On-line games are tipped to be very successful - they generate revenue in 2 main streams - the original purchase, and the on-line time. The balance between these stream could change the market considerably.

An important part of playing games is the community of games players, and the provison of parallel chat facilities (already more popular than the games themselves), merchandising and other games related services will be an important part of the industries income and the game player's entertainment experience.CD-ROM

Video games have almost all moved onto CD ROM - carries the graphical data, video and photos for the latest games. Pushing the development of the technology. Cheap to produce, mass market technology - cheap to build into games machines. CD ROM has been a considerable success as a technology, and the recent developmment of the DVD standards which crams a full length feature film onto a 5 1/2 inch disc for a TV or computer drive may make significant inroads into the video tape market and stimulate the development ever more 'real-video' games. The CD ROM will certainly remain an important entertainment technology because of the storage capacity and speed of access, although they will certainly used in conjunction with information and communications over networks.

Other audio-visual

There are many opther technology configurations that have been developed for particular types of interactive entertainment, often based on existing technology to allow alsmost instant access to the mass market. ITE Entertainment in Denmark has a system when the telephone keypad can be used to control action on the screen and it is in use in many countries. There are other propretary systems operated by companiessuch as NTN Communications, Scottish Television (OK TV), 2WayTV, Interfax and Valkeiser that synchronise broadcast television with data sent from a small home terminal attached top the telephone. Tnis allows viewers to interact with game shows, and win prizes at home.

An early commerical site for multimedia entertainment is the aeroplane, where there is a captive audience. Companies such British Airways and Virgin have updated the traditional movie and radio entertainment with individual screens, video games, and now gambling.

Cinema

Digital media offers the possibility of sending films electronically, cutting out the very expensive, and limiting process of film duplication and distribution. Currently high definition TV is acceptable for some low quality cinema, such as advertisements, company films etc. The bandwidth need to transmit a film in cinema definition, and the memory needed to store it is presently uneconomic. However development may allow small films that could not be duplicated on film to be seen must more widely, it would eliminate the ageing and wear and tear problems with celluloid, which takes many films out of circulation within a few years of release.

However delivery of films digitally to cinemas is still not feasible, but electronic transmission is being used in the production stage, particularly for sending film between the studio and the special effects companies who may be located in another continent (e.g. Hollywood to London). Of course the cinema industry is a major user of multimedia technology, to save costs on special effects and to generate the films themselves (Toy Story).

The film industry to also linking up with the video games industry. This is one of the convergences of technology and industry that was widely hyped in the early 1990s. CD ROM based games now include extensive film clips, specially made for the game. There is also a cross over between the media, trying to link audience for games to the cinema/video audience - the successful game Street Fighter was used as the basis for a movie.

Major Issues in Multimedia for Entertainment

Driving factors

There are three major drivers for change in the entertainment industry

1) The television entertainment companies wanting to stay ahead of the competition, and develop new services that will give them a larger bit of consumer leisure spending.

2) Hardware and software companies from the computer industry and consumer electronics trying to develop new markets for their products, partly due to falling returns in existing business.

3) Insatiable consumer demand for entertainment.

Confounding Factors

- The network technology
- Standards for mass market products and services
- Lack of a culture of use and production of 'interactive' entertainment
- The cost of network connection
- The socio-economic distribution of TV watchers and video game players
- Alternative digital systems, such as digital broadcasting that introduce little change in media and consumption of entertainment, but absorb investment that would otherwise go into full interactive services.
- Uncertain government postiton towards universal services and regualtion of content.

Major Uncertainties

- What type of interactive media will people want to us, and at what price - and will they be

willing to pay for the huge investment.

- Is a competitive market the best one for the development of the infrastructure?
- When will interactive TV technology be developed?
- Regulation and moral issues in general and in leading edge entertainment applications: gambling and pornography?
- Resolution of standards

Important Major Constituents

- Multinational publishing and media companies e.g. Time Warner, News Corp., Bertlesmann. These companies are investing huge amounts in new media, and control much of the entertainment media that is currently delivered, either by producing it, or controlling the distribution.
- Consumer electronics companies. Many of the traditional markets for consumer electronics are mature and saturated, so the industry is constantly looking to improve its products or invent new products that will revitalise their earnings. In the mature markets with mature technology, business has been moving to companies based in low cost production countries, so it is imperative that new technologies and markets are continually developed where the leading edge firms can continue to expoit their expertise. The leading companies are certainly Sony and Philips,
- National media companies - national television stations supply much of the television entertainment , and their investment, their exposure to market forces will be crucial to the opening up of mass markets.
- Advertisers. Advertisers pay for much of the current television and print entertainment. Advertisers are looking to new media to help develop the relationships of their clients to their customers. Any mass media that gains a larger market share from using interactive services will attract more advertising money, and new interactive entertainment on CD ROM, the Internet, networked games, on-line chat services will attract advertising money away from conventional media. The telcos are very important in the development of the technology for networks. They are also extremely wealthy, but generally conservative. One strength of the telcos is they have the facilities for billing the entire population.
- The cable and telecommunications companies. Most telcos are looking at interactive media to increase the revenue from their networks, which are being increasingly opened to competition. Home entertainment is one of the main markets targeted, in particular the television provision market. This starts to compete with CATV operators, in reality, these two industries are converging at the level of ownership, rather than delivery technology. Telecos have a core competance of microbilling that will be very important in at least some models of multimedia development.
- The computer companies and microprocessor manufactures especially Intel, PC assemblers and resellers (e.g. Dell, Compaq), software companies. These firms are trying to build a mass market for their products which are selling at increasingly small margins. Software companies are very important, developing the consumer entertainment applications, and the underlying technologies to run networks and develop products.

- Games companies, including the hardware designers and marketers and software houses. In the US the market for video games is larger than the music industry, but it is still a very dynamic industry and the days of the propriety platform are perhaps numbered.

- Standards committees. International standards are becoming increasingly complex and important in multimedia, as industries converge, and the benefits of collaboration on standards in major alliances, even if not monopolistic are clear to everyone. IN the field of entertainment, all the computing and network standards committees are important, but also those related to broadcasting. Examples include DVB and DAVIC working on interactive television standards.

- The regulators. Telecommunications and media are highly regulated industries. In telecommunications, liberalisation and competition tends to be the rule, but the permission to provide new multimedia services to the mass market is being used as a tool to develop the competition to the incumbent telcos. In media the content, ownership and distribution are all controlled. The authorities seem to be fighting a constant battle to control public demand and industry supply of violence and sex for entertainment.

- Designers and creators. Much of the appeal of multimedia will come from developing novel ways of using it that will engage audiences, players etc. It is very important that the technology is developed to give the tools those with the creative skills, and the commercial environment is flexible enough to allow for experimentation.

The Future

Although it is very difficult to predict the future of multmedia, the long term investments in technolog today, and the upheavals in the market enable a number of tentative conclusion to be drawn.

Entertainment Industry and market by 2010

- Digital broadcasts commonly received, and used for extensively for Pay TV, especailly premium services such as sports and movies, which will almost all be pay services, and more closely integrated with the management of movie release. Near Video on Demand common. More channels devoted to single issues, especially entertainment, to target advertising audience.

- CATV will be available in available in most urban and suburban areas in developed countries, and upgraded to broadband capacity, although much without broadband switching. All network operators will be able offer multimedia services on their networks.

- Networked games common entertainment for youth population

- Over 50% of population use the WWW or derived technology for entertainment

- Over 50% use e-mail and on-line forums for social activities

- Advanced MM, sometimes networked, used in most public entertaiment spaces: concerts, clubs, pubs,theme parks, museums

- Extensive use of interactive multimedia within tourism sector, early development of electronic package holidays.

- Limited on-line gambling allowed, problem of offshore gambling
- Properiety network services, possibly based on Internet technology bring networkred entertainment to 50% of population
- Slow development of interactive television programming and formats
- Film and video delivered by Digital disc and NVOD to many households, although VCR still video standard.
- Digital cameras and editing open up television enterteinment production facilitating much more local and specialised entertainment (special interest, ethnic minorities etc). This will be distributed on local TV, tape and disk.
- Multimedia entertainment integral part of youth culture
- Multimedia central to marketing of entertainment products
- Technical standards largely settled, but in the hands of dominant players.
- Many of the leading edge entertainment products are produced by smaller companies who have access to considerable market through unmediated channels and access to relatively cheap production technology.
- Mass market broadcasting and publishing increasingly dominated by major international media distributors.
- IPR will still be a problem for the development of multimedia, and pirating will be a considerable problem
- Considerable part of the population still unable to afford more advanced multimedia equipment and more importantly services, but will rely on equipment closely linked to advertising and popular premium services (where it is subsidised).
- Gender differences negligable in access to technology and skill amoung younger generation, but differentiation of services as strongly consumer oriented producers target different market sectors.

<u>after 2010</u>

- Close integration of broadcasting and network technology
- Multimedia PDA used in many recreational activities
- Possible development of a freer market as distribution channels continue to open on cable systems, but in demand broadcasting channel capacity outstrips supply again.

- Personal publishing including video begins possible for more than half of the population.
- Digital cameras common in private use.
- On demand television and radio more widely available but restricted by premium rates.
- New generation of children brought up in multimedia households

Conclusions

Entertainment is key to the development of multimedia technology, industry and awareness. It is one industry where the demand for new products and services is constantly outstripping the supply. It is also one of the most open markets in multimedia, despite the presence of dominant industry players who can control much of the supply side. These players are exceptionally market oriented, and the investment in new products is considerable.

The content providers - television production, magazine production, games companies etc. will not loss their market share is they adapt to the new technology. Indeed their skills will be increasingly in demand. The telecommunications companies will continue to profit from increased communications traffic. The predicted convergence of telecoms and broadcast companies is unlikely under present regulatory regimes, and the cultures are incompatible as well. However there will be continued realignment and convergence in the content industry - with multimedia publishing houses being the rule. Nonetheless the actually production of television, CD ROMs, Internet facilities will still remain separate on the ground for most projects, for practical reasons, and institutional reasons in the short term.

The home is already the centre for entertainment in many societies, and multimedia technology is unlikely to increase the overall amount of home based leisure activities unless there are other social changes which favour this. It will however increase the range of activities accessible from the home and open up new social spaces for many people otherwise deprived. Multimedia technology will however bring electronic communications and information into many more entertainment activities of all type, possibly increasing the financial cost of those activities, and certainly changing the distribution of the revenues. Entertainment will put multimedia terminals into more homes than any other service, and as such will be key in shaping the future development of more advanced services and technologies.

Policy makers still have to face up to many issues related to entertainment. The dominance of local culture by an 'international culture' is a worry for many policy makers, and efforts should be made to make sure that regional and local culture is preserved and developed. The technology and the systems such as the Internet should favour this, but skills and access should be the target of specific actions. The regulation of pornography and gambling will continue to be important, and the successful solutions will be those based on controlling the production and consumption rather than the technology. There will certainly continue to be an increasing number of particular cases over the next 10 years that will focus public and government attention on this perennial moral issues.

Advertising and marketing will be key to the development of new media and mass market entertainment systems. It will be increasingly difficult to escape from commercially-mediated environments that collect information on personal entertainment in return for cheaper access.

Public entertainment outside the home will not diminish appreciably with multimedia technology. Cinema will continue to thrive, and public venues with the latest technology will become ever more popular among the early adopters of entertainment - mostly younger people. Indeed, access to more information and direct experience in the home is as likely to increase the popularity of public entertainment and encourage travel and tourism.

Entertainment is a factor that is increasingly 'built in' to many other activities - work, education, rehabilitation etc., in recognition of the power of fun and enjoyment. Multimedia can enhance this, and industry and commerce will continue to pursue this path successfully.

In conclusion, huge demand for entertainment will be one of the most powerful factors influencing the development of multimedia. However the paradigm for entertainment is different to that of simple information retrieval, communication or rational goal oriented use of technology. The role of culture and society in defining entertainment and the creative input into providing entertainment makes it one of the more difficult sectors to predict the exact outcome, but also one of the easiest in which to say there will be a considerable uptake and use of technology over the next 15 years.

Endnotes

[1] *Silverstone, PICT paper no.27 - and other work, eg. from Leslie Haddon, Knut Sorenson and others, including the Cost A4 network authors from the Trondheim workshop, 1993 - discuss the domestication of technology in the household context, examining issues of family relationships, hierarchy, gender roles, the office-home divide and so on).*

[2] Broadcasters Audience Research Board 1989, Cultural Trends 1993:17.

[3] From [* PICT is empty or cannot be processed. | In-line Graphic *](European_Audiovisual_Observatory 1995)[* PICT is empty or cannot be processed. | In-line Graphic *], Television Adspend in Western Europe T.7.5

[4] [* PICT is empty or cannot be processed. | In-line Graphic *](European_Audiovisual_Observatory 1995)[* PICT is empty or cannot be processed. | In-line Graphic *]T.5.8 Total Turnover of video retail. Video industry growth rate is about 10%. The US market is much larger, 17139 ECU in 1994

[5] EU penetration rat 13%, 1994 EAO T2.10

[6] An example is 'Do the right thing' from Globo TV in Brazil

[7] For example the Broadcasting Bill in the UK Parliament due September 1996

[8] Although it is not a common European trend: many countries saw a significant reduction in cinema going in the late 1980s, with increased attendance over the early 90s, EAO Statistics.

[9] Break down is: video sales (35%), video rental (29%), TV movie channels (satellite and cable)(19%), cinema box office (17%) (of total £1.8 billion UK market)

[10] AC Neilsen estimates 11.5m users of the Internet in mid 1996 in the US)

[11] **Leisure Identities and Interactions** - John Kelly, George Allen (London) 1983 p.

[12] Chris Crawford proposes that the hobby status of video games is stagnating the market - they are being increasingly written for people who are experts and almost obsessed, and are on longer games to appeal to a wide range of people looking for entertainment. (Crawford, 1996)

[13] The Economist 14/10/95 p.106

[14] DVB 9500 'multimedia terminal' hooks up to TV, PC, printer, games console, CD or CD-I device and telephone - to allow transfer of and interaction with all types of digital info.

[15] Philips CD-i add-on for accessing Internet via TV (£99) - including software and modem

[16] BYTE magazine, November 1996

[17] http://www.bt.com/home/wireplay/

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