

Final report

DCMS

BBC Online review – module 2:
Future UK Internet market trends

16th March 2004

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1 Executive summary

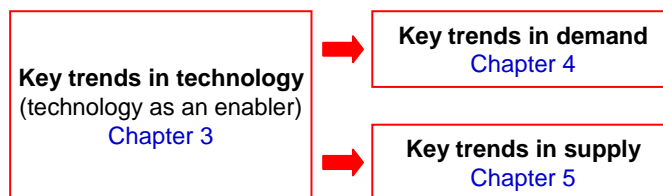
Introduction

This document forms a core part of module 2 - 'Market evolution and the future of BBC Online' and sets out our view of how we expect the online market to evolve within the next 10 years.

Based on detailed research and analysis, we have developed series of hypotheses about the key trends in the future evolution of the online market. These hypotheses are supported, where appropriate, by sub-hypotheses, as well as relevant market data and forecasts.

Hypotheses are grouped into three broad categories: 'technology', 'demand', and 'supply'. Trends in technology are considered as enablers of the key trends in the demand for and supply of online content and services (which, themselves, are interdependent).

Exhibit 1: Structure of future market hypotheses



The discussion of future market trends spans chapters 3 to 6 and is structured as follows:

- Chapter 3 provides evidence and data to support our hypotheses about future trends in technology
- Chapter 4 provides evidence and data to support our hypotheses about future trends in demand
- Chapter 5 provides evidence and data to support our hypotheses about future trends in supply

These hypotheses address future market trends over the next ten years, although all data forecasts only cover the next five years, beyond which period detailed forecasts become significantly more difficult to make (and, consequently, less useful).

1.1 Summary of technology evolution trends

Over the next five years, the Internet technology landscape in the UK will mature, enabling a raft of new services for the online consumer. A combination of developments in network delivery and receiving devices will increase the richness of content that can be consumed, as well as enabling innovative and advanced ways of sharing and paying for that content.

Bandwidth and compression technology enhancements will mean that the quality of audio and video content converge towards broadcast quality, whilst technology enabling community content (content created by users and shared amongst them) will become more widely available. Commercial models for the sale and distribution of content will become viable, as distribution mechanisms become more secure.

There are four key hypotheses that underpin this view and are discussed in full later in chapter 4.

1. *Internet access via broadband (by 2006) and 3G mobile (by 2010) will be capable of delivering a range of high quality audio/visual media services, such as on-demand broadcast quality video*

- Increased broadband and 3G access speeds and new compression technologies will allow faster transfer of data to PCs and mobile handsets. Average broadband connection speeds will increase rapidly, allowing the delivery of high resolution and reliable streaming and the downloading of video. Mobile handsets will become a mainstream device for consuming content as device hardware (processor, storage, and display) and software develop

2. *The fixed Internet will become a channel for distributing content for consumption from a number of devices (e.g. TV, mobile handset)*

- Devices (PC, TV, mobile etc.) are becoming increasingly capable of storing and playing different types of content and it is becoming easier for consumers to be able to transfer content from one device to another via personal local (fixed or wireless) networks. Consequently, content delivered via (broadband) fixed connections to the PC will be easily transferable to other devices (e.g. TV, mobile) for consumption

3. *Consumers will find it increasingly affordable and easy to create and share home made audio/visual content (e.g. home-made film clips)*

- Services allowing consumers to create their own home-made content will become widely available, as the costs of content creation hardware and software falls and application functionality and user interfaces improve. Coupled with developments in web-based sharing technology and web communities, this will make the distribution and consumption of consumer-created content over the Internet much easier and more attractive

4. *Developments in digital rights management technology (DRM) will enable the Internet as a mass market medium for distribution of commercial content services (e.g. video and music services)*

- The increased use of common standards in technology, industry co-operation and mass market deployment by market leaders will mean that DRM will become an integral part of content distribution and will effectively protect premium content against mass market piracy. This will allow the Internet to become a mass market medium for commercial content

1.2 Summary of demand evolution trends

The number of UK citizens using the Internet continues to rise steadily, though with varying usage patterns and methods of access across different user groups. Both household Internet penetration and public access levels (e.g. via libraries) are growing. As users become more familiar with the Internet, rich audio and video content will become more popular, driving users' propensity to pay for these services, over both the fixed and mobile Internet.

There are four key hypotheses that underpin these trends in demand which are discussed in full later in chapter 5.

1. ***Broadband penetration of households will reach 35% by 2008, with narrowband penetration at 28%. Mobile Internet penetration will be 58% by 2008***
 - Broadband and mobile will be two most popular platforms for accessing the Internet over the next five to ten years. Broadband will reach 35% of all homes by 2008, driven by universal availability and falling prices. As penetration of Internet-enabled mobile devices grows, 58% of the population will regularly use their devices to access online services. Other new access technologies, such as webTV, are likely to have limited penetration
2. ***Access to and usage of online services will continue to vary amongst different socio-economic and age groups***
 - Fixed line Internet access in the home will remain skewed towards higher demographic groups, with the continuing relatively high cost of PCs acting as a barrier to take-up by lower socio-economic groups. This lack of home-based access will translate into limited use by lower socio-economic groups of more sophisticated services, such as online radio and video services, banking, and government services
3. ***Overall time spent on the Internet will increase by over 60% by 2008, with audio/visual services accounting for a large share of growth in usage***
 - The average amount of time spent online via the fixed Internet will increase by over 60% by 2008. Total time spent using mobile devices will grow by 17%; this will largely be driven by the consumption of new content services, particularly audio visual content. Music, video, and online gaming services will become heavily used on both the fixed Internet and (3G) mobile
4. ***Paid-for content and advertising revenues will grow rapidly over the next five years, as Internet and mobile platforms continue to mature as commercial media***
 - Paid for content revenues from the fixed Internet will grow rapidly, from around £80m to £400m; advertising revenues will grow from around £200m to £300m by 2007. This will be driven by the take-up of legitimate, secure content services and a growing consumer willingness to pay for content. In mobile, the substantially larger customer base and existing payment methods mean that revenues are already nearly £500m and are forecast to increase to around £2bn by 2007

1.3 Summary of supply evolution trends

There are a number of drivers that will play a role in shaping the overall UK Internet supply market over the next five years. First, as the Internet becomes a technically viable medium for content, leading rights holders are increasingly looking to exploit the value of their content on the Internet, as well as traditional media. Second, with many rights holders based in the US, the dominance of US providers in the online content market will be reinforced. But, as users become more experienced and look for a wider range and more specific types of content, search tools will become central to the usage of the Internet. This will be enabled by advances in search technology, enhancing the usefulness of search engines; search providers will, also, add extra features to their sites, such as email and shopping tools.

Three key trends supply are captured in the following hypotheses which are discussed in detail in chapter 6.

- 1. Premium rights holders and content providers are increasingly looking to exploit the Internet as a commercial medium – especially through the provision of audio/video content services**
 - Over the next five years, the increasing reach and commercial potential of fixed Internet and mobile will mean that major premium rights holders and content providers will develop significantly more substantial online services, using the medium as an additional core channel for content distribution and revenue generation. This will lead to a raft of audio/visual content services becoming available, alongside greater rights segmentation and windowing of content
- 2. Supply of English language content to the broadband market will be led by US players**
 - The absence of defined geographical 'borders' between different, online markets, coupled with a shared native language, will mean that broadband Internet content will be dominated by US-originated content (as is already the case in the film sector). For mobile, however, the more advanced development of the UK market means that over the next five years, UK mobile content is likely to be more domestically originated
- 3. Search tools will become central to usage, acting as a gateway to content**
 - As consumers have become more experienced in using the Internet, they have started to use search engines as a means to reaching specific content destinations, rather than relying on more traditional content portals to guide them to services; this has already fuelled a rapid growth in the usage of search tools. Over the next five years, intelligent search functionality will continue to develop and providers of search engines will become increasingly important as content gateways

1.4 Summary of key market performance indicators

The following table lists the key performance indicators that are forecast in this paper. Each metric is discussed in detail elsewhere in the document, in the section indicated in the “Ref” column.

Exhibit 2: Key performance indicators

KPI	Ref	Unit	2003	2004	2005	2006	2007	2008
Penetration								
Fixed internet penetration total	5.1	%	52%	57%	60%	62%	62%	63%
- Broadband households	5.1	%	12%	16%	22%	27%	31%	35%
- Narrowband households	5.1	%	40%	41%	38%	35%	31%	28%
Mobile handset penetration	5.1	%	82%	83%	84%	84%	85%	85%
Internet-enabled handset penetration	5.1	%	45%	57%	66%	72%	76%	79%
Proportion of user base regularly using mobile internet	5.1	%	14%	20%	30%	42%	53%	58%
Usage (leisure media time)								
Online usage	5.3	mins/week	140	⇒	⇒	⇒	⇒	234
Mobile usage	5.3	mins/week	89	⇒	⇒	⇒	⇒	104
Revenues								
UK online revenues	5.4	£m	84	⇒	207	⇒	439	
Mobile data revenues	5.4	£m	651	846	1,180	1,616	2,167	

Data sourced from third parties

1.5 Conclusion

The combined effect of the forecast trends in technology, demand, and supply set out in this paper will create significant step changes in the operation of the online market, particularly in the range and depth of services available, in online consumption patterns, and in the commercial market ecology.

In some ways, the type of content available and the ways in which content is consumed will mirror more closely today’s broadcasting media. As online technology continues to evolve, many broadcasters and suppliers of broadcast content are expected, increasingly, to view the Internet as a complementary medium to TV and radio.

These trends and developments have significant implications for the future remit of BBC Online and its role within the wider online ecology. They will inform the Review’s consideration of a number of key questions about, for example, BBC Online’s core purposes, its operational delivery, and its potential market impact.

Exhibit 3: Key questions for consideration in light of future market hypotheses

Area	Key questions
Purposes and remit	<ul style="list-style-type: none"> • Are there grounds for public intervention? <ul style="list-style-type: none"> – to what degree would the commercial sector provide this service of its own accord? (today and in the future) – even if there is an existing market for this service, or one is likely to be created, is there still value in having public provision of this service (for example, to ensure quality and competition)?

Corporate strategy	<ul style="list-style-type: none">• Given its remit, what specific services should BBC Online provide?• In addition, should BBC Online provide these services on new technology platforms, particularly mobile and broadband?
Operational delivery	<ul style="list-style-type: none">• For each service, should BBC Online originate the content (or application) itself or outsource provision to others?• How much should the BBC spend on the different aspects of its operations?
Performance assessment	<ul style="list-style-type: none">• How should BBC Online's performance in each service areas be assessed?
Market impact	<ul style="list-style-type: none">• What is the market impact of the BBC providing this as a public service?
Governance and regulation	<ul style="list-style-type: none">• How should these services be approved, regulated and reviewed?

These implications will need to be considered across the full range of services and activities that BBC Online currently provides and/or could, potentially, provide in the future. These include:

- News and public information
- Sport content
- Educational content
- Regional content
- Other programme-related content
- Community services and tools
- 'Trusted guide to the Internet' services
- Strengthening relationships with licence fee players
- E-commerce

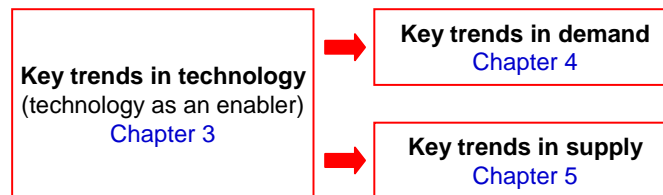
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3 Key trends in technology

Summary

Over the next five years, the Internet technology landscape in the UK will mature, enabling a raft of new services for the online consumer. A combination of developments in network delivery and receiving devices will increase the richness of content that can be consumed, as well as enabling innovative and advanced ways of sharing and paying for that content.

Bandwidth and compression technology enhancements will mean that the quality of audio and video content converge towards broadcast quality, whilst technology enabling community content (content created by users and shared amongst them) will become more widely available. Commercial models for the sale and distribution of content will become viable, as distribution mechanisms become more secure.

The specific hypotheses underpinning this macro view are listed below and discussed in turn in the rest of this chapter.

- Internet access via broadband (by 2006) and 3G mobile (by 2010) will be capable of delivering a range of high quality audio/visual media services, such as on-demand broadcast quality video
- The fixed Internet will become a channel for distributing content to be consumed from a number of devices (e.g. TV, mobile handset)
- Consumers will find it increasingly affordable and easy to create and share home made audio/visual content (e.g. home-made film clips)
- Developments in digital rights management technology (DRM) will enable the Internet as a mass market medium for distribution of commercial content services (e.g. video and music services)

3.1 Internet access via broadband (by 2006) and 3G mobile (by 2010) will be capable of delivering a range of high quality audio/visual media services, such as on-demand broadcast quality video

Until five years ago, Internet (fixed and mobile) services had been largely limited to text, pictures and low quality audio and video. In 1999, MP3 (Mpeg-1 layer 3) audio compression technology started to become widely adopted by content providers, allowing high quality audio downloads to become a reality. Over the next ten years, further technology developments will enable broadband and 3G mobile to become leading platforms for delivering high quality audio and video services. These services will be enabled by improvements in technology in transmission speeds, compression technologies, and the capabilities of devices. Each of these areas of development is discussed in this section.

Transmission speeds

Transmission speeds over both broadband and mobile are set to increase, with average speeds increasing three to four times their current levels by 2008. Early indications of this upward trend are provided by emerging service offerings and comparisons with overseas markets.¹

In the fixed Internet, narrowband products in the UK have been limited to 56kbps, whilst most broadband products have been offered at 512kbps bandwidth. Higher bandwidths are, however, becoming available: BT now offers a 1Mbps ADSL wholesale product and AOL was the first operator to launch (in December 2003) a 1Mbps residential broadband service, at £35 per month. In addition, VDSL services, available in a small number of geographical areas in the UK, are capable of delivering 'TV-on-demand' content through 2Mbps connections.

Overseas incumbent operators already provide higher ADSL bandwidth than in the UK, with services in France, Germany, Italy and the US providing 1 to 1.5Mbps as standard. Commercial operators already offer 3Mbps in Canada, and up to 8Mbps in Japan.

In future, we expect the average bandwidth for UK broadband users to converge towards 2Mbps, four times current levels.

In the mobile Internet arena, most UK mobile operators, with the exception of 'Three' (the 3G new entrant), currently provide connection rates of 20-30Kbps through their GPRS services. Three's 3G network currently delivers around 64kbps to the user's handset. Similar speeds will become available on other networks, as 3G is rolled out by the other operators.

Over the next five years, we expect that average connection speeds will tend towards 200kbps, as demand for 3G grows and operators invest more in their network infrastructure (and use more of their 3G spectrum).

¹ Forecasts set out in this hypothesis are the opinion of Spectrum and are based on interviews with fixed and mobile operators and comparisons with other markets

Exhibit 5: Summary of access technology downlink speeds

	Access Technology	Theoretical maximum downstream bandwidth	Current typical downstream bandwidth in UK	2008 typical downstream bandwidth in UK
Fixed	ADSL	9Mbps	0.5Mbps	2Mbps
	Cable	> 50Mbps	0.5-1Mbps	11Mbps
Mobile	GPRS	168Kbps	20-30Kbps	128Kbps
	3G	2Mbps	64Kbps	200Kbps

Source: Spectrum analysis

Compression technologies

A wide range of codecs (compression/decompression algorithms) exist that reduce the bandwidth requirements for content distribution; these include Mpeg, Real, Quicktime, and Windows Media.

In the past, the rate of increase in distribution efficiency, delivered by advances in compression technologies, has been fairly uniform in the past. Whilst new technologies offer diminishing returns, over the next five years, new codecs are expected to emerge which will continue to reduce (to a degree) the bandwidth required to deliver content, particularly video, over broadband and 3G. These technologies include Windows Media 9 and Mpeg-4.

Device capabilities

The capabilities of both fixed terminals (especially PCs and PVRs, discussed below) and mobiles will continue to grow rapidly over the next five years.

For several years, PCs have been capable of displaying rich multimedia content, as a result of exponential increases in memory (RAM), processing and storage powers. Capabilities in each of these areas will continue to improve rapidly – most significantly, in the area of device storage space. Increases in memory and processing power will be of diminishing marginal value from a user perspective, as most user requirements are already met by existing capabilities. Increases in device storage space, however, will allow the local storage of libraries of ‘rich’ audio and video content. The future available scale of storage will be far larger than on current devices: the recent and current rate of annual growth in the capacity of devices is around 50% and there is no reason to expect this rate to decline over the next five years.

Television personal video recorders (PVRs – set top boxes that are also ‘intelligent’ digital recorders) are also now providing growing amounts of storage capacity: the latest Sky (Sky Plus) PVR already offers 80GB of storage; this allows large volumes (up to 50 hours) of broadcast TV and radio content – and, also, enables online content received by or transferred to the STB, – to be stored locally.

The next 5 years will also see significant developments in the capabilities of mobile handsets (particularly 3G handsets), which will become devices for receiving, storing and playing rich multimedia content and, in the medium term, will develop some of the capabilities of today’s PCs:

- Audio and video capabilities will improve: all handsets will have built-in media players
- The amount of in-handset memory will increase and more handsets will be capable of using removable memory cards; the cost of these cards will fall considerably, allowing the storage of hours of music or video

- Colour screens are already common features in handsets and will continue to get larger, with higher resolution and more colours
- Processor speed and software development will enable web browsing tools, approaching the functionality of PC browsers

Conclusion

Transmission speeds are likely to increase substantially and (to a lesser extent) compression technologies will improve, leading to a far richer range of content becoming available over broadband. These developments, coupled with developments in the processing and storage capabilities of fixed and mobile devices, will allow a much richer set of content services to be delivered over the fixed Internet and over the mobile Internet. The table below summarises the types of services capable of being delivered on a mass market basis, over the next five years.

Exhibit 6: Sample services that will be widely available

Delivery platform	Today	2005	2008
Fixed Internet	Audio streaming (e.g. radio) Audio downloads (mp3s) Video clip downloads	Feature length video downloads Multiplayer online games Video messaging	On-demand/ interactive video Video chat
Mobile	Music clip downloads Java games	Video clip downloads Simple online games Video calling	Live video streaming Multiplayer online games

3.2 The fixed Internet will become a channel for distributing content to be consumed from a number of devices (e.g. TV, mobile handset)

To date, the majority of Internet content has been accessed through a fixed line connection and consumed on the PC. Over the next five years, the fixed line will increasingly be used as a means of delivering content to the home, which can then be consumed from a number of devices (e.g. PC, TV/PVR, mobile); this will be made possible by three key developments discussed in this section:

- Devices (PC, TV, mobile etc.) will increasingly be capable of storing and playing different types of content
- For consumers, transferring content from one device to another will be made easier
- The production and reversioning of content by suppliers for multiple platforms and devices will become easier, cheaper and more widespread

Device capabilities

Devices are increasingly being used to consume different types of content: for example, TVs can be used to display web pages and mobiles are being used to download games. These changes have been, in large part, enabled by developments in the display and storage capabilities of devices. As discussed in section 3.1 above, PCs and, especially, TV PVRs and mobile handsets will continue to develop very rapidly over the next five years, further blurring the distinctions between the capabilities of device types and the types of content they are used to consume.

Exhibit 7: Storage, display and content types for TV and mobile devices, now and 2008

		Now	2008
TV	Storage	Predominantly analogue VHS storage DVD players PVRs with <50 hours of video storage	PVRs with large video storage - 1000s of hours Removable digital storage e.g. DVD burners
	Display	Mostly tube based TV sets Poor at displaying web-pages Menu systems designed for TV	LCD Flat screen displays capable of high quality web-page display Menu systems designed to navigate multiple media types (e.g. TV, radio stations; games)
	Content	Broadcast content – TV/ Radio Recorded media e.g. VHS, DVD, video games	Online games Broadband-delivered on-demand video and audio streams and downloads Web-pages
Mobile	Storage	Minimal storage capabilities High-end phones incorporating removable memory cards	Removable media cards, internal hard disks with 10+ GBs of storage
	Display	1" by 1" screens Some colour displays Low resolutions	2" by 1.5" screens All colour displays High quality resolution – good enough to watch video
	Content	WAP – text and images Ringtones Simple games	Video content (e.g. TV programme highlights, news bulletins) Full length audio tracks Advanced games

Source: Spectrum analysis

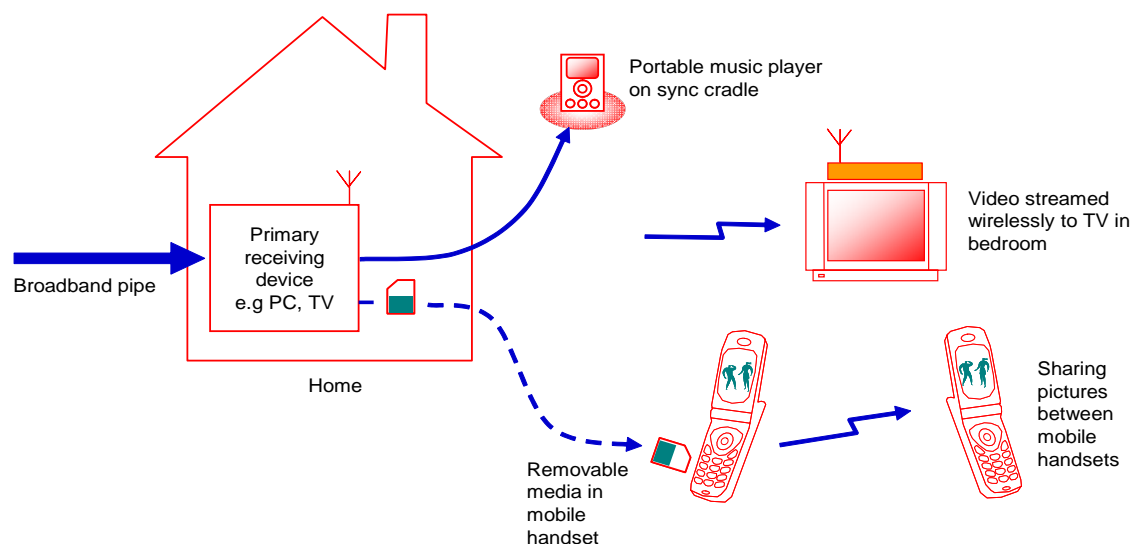
Transfer of content between devices

Users are increasingly able to transfer different types of content between different types of devices. This trend is illustrated by a number of emerging market developments:

- Broadband connections will be used to serve multiple devices simultaneously, such as games consoles and multiple PCs or laptops (e.g. BT already allows broadband customers to share the connection between a PC and games console²). Many new set top boxes have network ports which will, potentially, allow content, delivered over the Internet, to be displayed on conventional television sets
- In the next five years, many devices will be manufactured which are compatible with wireless technologies, such as Bluetooth and Wireless local area networks (LANs). Bluetooth chips allow small amounts of data (such as individual audio or video streams) to be transferred between devices up to 10m apart. 120m Bluetooth compliant devices were sold worldwide in 2003, up from 32m in 2002.³ Wireless LAN allows the transfer of large volumes of data between devices up to 100m apart and, in future, may be used (for example) to stream video from a set-top box to a bedroom TV
- Removable features, such as memory cards and DVD drives, are increasingly compatible with a range of devices (for example, memory cards can be used in high-end mobile handsets, PCs, laptops, and digital cameras, whilst DVDs can now be used in PCs, DVD players and DVD camcorders) This permits stored content to be transferred easily between diverse devices

These developments will all significantly improve the consumers' ability to transfer content, particularly from fixed devices (e.g. PCs, PVRs) to mobile devices (e.g. PDAs, digital cameras), and vice-versa, blurring the boundaries between content types for different platforms, especially 'broadband content' and 'mobile content.' For example, listening to music via mobile may be a service that is 'live' (streamed on-demand over the 3G network), whilst watching TV news clips via mobile may be a service that is downloaded overnight to a PC via broadband and, then, transferred to a mobile device to view 'offline'.

Exhibit 8: Sharing content between devices, all sourced through a broadband pipe



² BT Yahoo! Broadband for games console
³ Global Mobile 24 September 2003

Converging content production

The process of content production will, typically, remain (and will do so over the next five years) distinct for different platforms and devices – especially for broadcast and Internet content - but, increasingly, convergence between device capabilities will, also, reduce the cost of reversioning content for different devices. For example, the audio capabilities of most mobile phones today requires music tracks to be reduced down to a small file for use as a ringtone. In future, mobile phones will be capable of playing CD quality audio recordings, encoded in a common format, reducing the level of reversioning required to create music formats for these devices.

New integrated platforms for content delivery will also allow content providers to deliver content to a range of devices from a single content management system (CMS). CMSs will automatically be able to render a given unit of content in a format suitable for the device to which it is being delivered. For example, Internet content written in XML-based mark-up language will, when requested, be filtered through a set of templates that produce the content amended, as necessary, for different devices (PC, TV, mobile).

Many sites already offer platform and device-specific content originated from the same source: as an example, the Friends Reunited website is available over the Internet and on BSkyB's interactive platform, but is driven from the same core database of content. Similarly, Transport for London already offers its timetable database for fixed and mobile Internet utilising the same source. Over the next five years, most websites will make their content available for consumption over PC, TV and mobile devices.

Conclusion

Together, these developments in devices, inter-device connectivity, and content production processes will reduce the differentiation between the content services and applications consumed on PCs, TVs, and mobile devices. Users will be able to consume content delivered over the fixed line Internet connection (which will be the most cost-efficient way of receiving content, compared to mobile connections) on the device of their choice: content consumption on different devices will be much more driven by the consumer preferences than the availability of that content on different platforms.

The table below illustrates how patterns in consumption of different service types across different devices will change over the next five years.

Exhibit 9: Change in consumption of services over key devices

Examples of online Content type	Device over which Internet content is consumed today			Device over which content is likely to be consumed in 5 yrs time		
	PC	TV	Mobile	PC	TV	Mobile
Recorded music	✓			✓		✓
News bulletins	✓			✓	✓	✓
On-demand documentary	✓			✓	✓	
Multiplayer games	✓			✓	✓	✓

3.3 Consumers will find it increasingly affordable and easy to create and share home made audio/visual content (e.g. home-made film clips)

Historically, consumer media usage has been largely limited to the consumption of content produced by established industry players (such as broadcasters and newspapers). Technological developments, however, especially digitisation, are making it easier for consumers to create and manipulate their own content and become involved in the production of core content types, such as text, video and audio. Increasingly, the distinction between professionally created content and amateur footage is blurring (as a striking example, the entire Jackass TV series was filmed using a consumer handheld video camera). The Internet is also becoming a means of sharing and distributing amateur content amongst friends, those with similar interests, and the wider general public.

These trends are being enabled by the following drivers, each discussed in turn in this section:

- Increasing functionality, ease of use, and affordability of content creation tools (hardware and software)
- Availability of community tools, allowing publishing and sharing of content with others

Content creation tools

The exhibit below summarises how the functionality of consumer devices is expected to change over the next five years, enabling users to produce a wide range of content types.

Exhibit 10: Content creation hardware and software

	Now	2008	
Digital Cameras	Functionality	<ul style="list-style-type: none"> • Still pictures of comparable quality to photos • Short low quality video clips with poor audio • Large amounts of storage • Limited zoom and flash capabilities 	<ul style="list-style-type: none"> • Matches or exceeds capabilities of high end traditional film based cameras • Capable of capturing quality video/audio • Longer battery life • Integrated wireless connectivity
	Usability	<ul style="list-style-type: none"> • Transfer of pictures/video to PC via cables and removable media • Simple cut-down versions of software editing tools provided with the device • Need to be PC savvy 	<ul style="list-style-type: none"> • Automated transfer • Connects to other devices wirelessly • Automated picture editing (eg. red-eye removal) • On device editing
Mobile handsets	Functionality	<ul style="list-style-type: none"> • Cameras only incorporated into high-end devices • Low quality picture – unlikely to be kept • Little or no zoom/flash capabilities • Bluetooth 	<ul style="list-style-type: none"> • Camera devices in most phones • Advanced digital cameras • Video capture as standard • Zoom and flash integrated
	Usability	<ul style="list-style-type: none"> • Difficult to share captured images with others • No editing • Small and convenient 	<ul style="list-style-type: none"> • Automated sharing/sending of files via picture message, email, web transfer • Camera based editing
Camcorders	Functionality	<ul style="list-style-type: none"> • Take video and stills • One to two hours of filming per session • Tape based technology 	<ul style="list-style-type: none"> • Several hours of battery life • On-camera editing • Tapeless media technology – based on DVD or hard drive • WLAN integrated
	Usability	<ul style="list-style-type: none"> • Small and convenient • Transfer of pictures/video to PC via cables 	<ul style="list-style-type: none"> • Automated transfer • Connects to other devices wirelessly • Automated chaptering

The prices of digital devices have dropped dramatically over the last five years, with digital cameras and camcorders falling to the levels of top-end analogue/film based devices (such as SLR cameras). These price

drops have been made possible through increasing economies of scale and greater volume of demand, both of which will continue to grow as digital devices replace analogue/mechanical devices.

Content publishing and sharing

A range of new tools and applications are allowing consumers to publish and share their content with others:

- Weblogging⁴ tools are providing the means for individuals to publish their thoughts and opinions on subjects in which they are interested to a global audience. Major corporations are investing in this technology, as shown by the purchase of Pyra Labs (owners of blogger.com) by Google, and the launch of “AOL Journals” by Time Warner.
- Dedicated content sharing sites, such as ‘Sony Screenblast’, are becoming fully integrated with content creation hardware and software and enabling consumers to share their home videos and photos online
- File sharing networks and viral email distribution are creating a low-cost channel for the distribution of rich content
- Amateur content creators can use free online registries to license their content, describing in simple terms how their content can be used and passed on, within the laws of copyright. Services such as Creative Commons⁵ provide a human and computer-readable licence to content authors wishing to protect their intellectual property

These tools enable the sharing of a wide range of content types, from amateur music to pictures and video. Content sharing communities are already developing in which users are able to post self-created content and share it amongst pre-defined user groups.

Conclusion

Together, these developments are allowing the creation and consumption of user-generated content to play a growing role in the lives of consumers, with new online communities developing each week, based around consumer-created content. The table below summarises this section by illustrating some of the ways in which these trends are likely to be manifested, in terms of user behaviour, into in 5 years time.

Exhibit 11: User-generated content

	Now	2008
Online journals	<ul style="list-style-type: none"> • Create an online journal with text and images uploaded through the web 	<ul style="list-style-type: none"> • Create an online journal with text, video and audio uploaded through web, mobile
Music sharing	<ul style="list-style-type: none"> • Create a CD mix of favourite tracks and give to a friend 	<ul style="list-style-type: none"> • Create an online play-list to share with friends in a common hub
Journalism	<ul style="list-style-type: none"> • Write an article and post on the web 	<ul style="list-style-type: none"> • Create a video report and post on the web
File sharing	<ul style="list-style-type: none"> • Upload own music or video content onto a file-sharing network for general consumption • Copyright restrictions are misunderstood and abused 	<ul style="list-style-type: none"> • File-sharing networks allow for users to control distribution e.g. share only with friends and family, charge for content, track usage and receive comments and reviews • Simple methods of licensing content increases awareness of content usage restrictions
Content consumption	<ul style="list-style-type: none"> • Predominantly professional content, delivered by major media companies 	<ul style="list-style-type: none"> • Increasing consumption of ‘amateur’ content
Interactivity	<ul style="list-style-type: none"> • Send SMS or emails to a television show or website 	<ul style="list-style-type: none"> • Send video clips and photographs to a television show or website

⁴ Allow users to create easily updateable webpages to be used as an online diary or a means of publishing opinions, journalism and reportage on topics of personal interest. See for example, www.livejournal.com, www.typepad.com, www.userland.com

⁵ www.creativecommons.org

3.4 Developments in digital rights management technology (DRM) will enable the Internet as a mass market medium for distribution of commercial content services

To date, the commercial provision of online content (for example, album tracks and feature-length movies) has been hampered by the slow deployment and user acceptance of digital rights management (DRM) technology (i.e. software designed to prevent unauthorised distribution or consumption of content)

Consequently, online piracy has become widespread (especially in the music sector) and business models for the commercial provision of audio and video services have not been established. This section discusses these problems and considers how a number of emerging solutions may address these problems, including standardisation of the technology and wider technology developments.

DRM technologies must overcome three key hurdles if widespread adoption is to be achieved:

- First, the Internet is based on open-standards such as TCP/IP and HTML, which make it more difficult to impose controls such as DRM
- Second, DRM solutions have to gain user acceptance, both by minimising the “friction” created by their use in media distribution systems and by creating added value for users, by enabling new services and usage patterns
- Third, in order to be effective, specific DRM solutions need to be adopted by multiple players in the value chain, for example, by both hardware manufacturers and content owners

A number of changes are occurring (and will continue over the next five years) in the marketplace, which may lead to wide and successful deployment and mass user adoption of DRM; these include the emergence of technology standards; the actual deployment of DRM solutions by industry leaders and bodies; and further developments in DRM technology. Together, these developments will help to secure the commercial value of online content and allow the Internet to grow into a mass market medium for content distribution.

Technology standardisation

Whilst the provision of DRM technology is currently fragmented, the communications sector is looking to adopt industry-wide technical standards, which will provide a common framework for technology development and deployment. Already, significant progress has been made in developing standards for core DRM functions, for example:

- *Content Identification* – the Digital Object Identifier system (DOI) is emerging as a potential standard for identifying and referring to content; it is similar in nature to existing standards for identifying intellectual property, such as ISBN for publications
- *Rights Expression Languages* (REs) – these languages imbed rights permissions to the content itself (for example, if the file is allowed to be copied, or if a payment must be made to copy the file). XrML is a standard, which has been adopted by the MPEG (Motion Picture Expert Group) body responsible for administering the dominant standards in digital music and video. Another emerging standard in this area is the Open Digital Rights Language (ODRL)

It is not yet clear which standard(s) will eventually prevail; it is, however, strongly in the commercial interests of content owners and service providers to agree such standards in the short to medium term and a major strategic priority.⁶

⁶ Based on interviews with industry operators, including Vodafone and Freeserve

Industry deployment of DRM solutions

A major barrier to the diffusion of DRM has been the need for co-operation across industry sectors, particularly between hardware vendors, software developers and media companies. There are, however, signs that industry co-operation is developing. For example, the Trusted Computing Group (TCG) in the PC environment and the Open Mobile Alliance (OMA) in mobile are driving forward the adoption of common frameworks for DRM, whilst the Organisation for the Advancement of Structured Information Standards (OASIS) is playing a role in encouraging the adoption of common standards across industry sectors. These developments allow for software to be distributed within the content and technology supply sectors.

Effective deployment of DRM requires penetration of the consumer market as well as the supplier sectors; it is vital to consumer awareness, acceptance and usage of DRM solutions that ‘industry champions’ are willing to deploy such solutions commercially. Some important industry initiatives include:

- In the PC environment, Microsoft is now incorporating ‘trusted computing’ technology into its operating systems and applications, under the ‘Next Generation Secure Computing Base for Windows’ (NGSCB) initiative. NGSCB is an upgrade to the Windows system, combining software and hardware controls in order to create a DRM system that gives content providers unprecedented control over the distribution of their content.⁷ The first elements of this system are due to be introduced in 2004
- In the mobile industry, Vodafone has recently introduced DRM technology into its Live! service, enabling users to be charged for exchanging copyrighted multimedia content, and preventing that content from being freely forwarded amongst users⁸

If leading industry players continue to collaborate on the development and promotion of effective DRM solutions, protected content of a reliable quality that must be paid for will become a more widely accepted – even, the default – proposition for users.

DRM technology developments

DRM capabilities are also expected to develop further over the next five years. Some of the key developments are summarised in the table below.

Exhibit 12: Summary of current and future DRM capabilities

	Now	2008
PC-based DRM	<ul style="list-style-type: none"> • Allows content owners to package and encrypt digital content files which can then only be opened with a digital licence key from the content provider <ul style="list-style-type: none"> – Allows basic controls on access to content • This feature is built into Microsoft Media Player, installed in 450m desktop PCs worldwide • Used by a collection of Windows content partners • However, easily overcome 	<ul style="list-style-type: none"> • PCs will incorporate hardware and software that makes them a ‘trusted’ device for content similar to BSkyB’s set top box • User authentication will ensure the legitimacy of users • Will allow innovative business models e.g.: <ul style="list-style-type: none"> – limited duration/limited number of uses – rental/preview models – controlled transfer to other devices • Very difficult to hack (as per NDS conditional access system used by Sky)
Mobile	<ul style="list-style-type: none"> • Limited DRM incorporated into mobile hardware • Allows forward looking to prevent peer to peer distribution • Very easy to hack given the small file size of 	<ul style="list-style-type: none"> • Developing industry wide DRM standards - OMA (Open Mobile Alliance) • Technology being integrated into handsets and content/software • Will allow sophisticated control and tracking of

⁷ For example, content providers will be able to “revoke” files that they believe are being illegally distributed, removing them from users machines

⁸ Source: Mobile Communications, April 2003

Now	2008
the content and the weak processing power of handsets, limiting the level of encryption and protection that can be incorporated	content – Allows mobile operator to charge subscribers for content forwarded to others

These future developments in DRM software functionality will create new commercial business models, by enabling a wider range of service offerings to users.

Conclusion

Based on today's current DRM capabilities and deployment, current DRM-based business models include:

- In the UK, OD2 provides a secure "pay per track" music download system to major ISPs, using encryption technology included in the Microsoft Windows Media player
- In the USA, Movielink has deployed DRM technology from a range of vendors, including Microsoft; it provides a service offering downloadable movies on a "rental" model, offering users 24 hours access to the file before it becomes unusable
- Amazon.com currently offers a downloadable e-book service, using DRM technology incorporated in Adobe Reader software

Over the next five years, as a result of the developments in DRM technology discussed above, these business models and commercial services will become more sophisticated with DRM supporting services such as:

- Limited access – e.g. only the purchaser can use; can only be used within a specific time period
- Metered usage models –e.g. pay-per-play, limited number of downloads
- Content 'gifts' – e.g. pay for online content that can (only) be consumed by other specified users
- Wholesale 'sale-and-return' models – e.g. revenues for rights can be sold on a wholesale basis (e.g. to ISPs), depending on the level of usage/take up

4 Key trends in demand

Summary

The number of UK citizens using the Internet continues to rise steadily, though with varying usage patterns and methods of access across different user groups. Both household Internet penetration and levels of public access (e.g. via libraries) are growing. As users become more familiar with the Internet, rich audio and video content will become more popular and users' propensity to pay for these services, over both the fixed and mobile Internet, will increase.

We have developed the following hypotheses that capture the future key trends in demand:

- Broadband penetration of households will reach 35% by 2008, with narrowband penetration at 28%. Mobile Internet penetration will be 58% by 2008
- Access to and usage of online services will continue to vary amongst different socio-economic and age groups
- Overall time spent on the Internet will increase by over 60% by 2008, with audio/visual services accounting for a large share of growth in usage
- Paid-for content and advertising revenues will grow rapidly over the next five years, as Internet and mobile platforms continue to mature as commercial media

4.1 Broadband penetration of households will reach 35% by 2008, with narrowband penetration at 28%. Mobile Internet penetration will be 58% by 2008

Fixed Internet penetration in the UK has shown tremendous growth over the last few years, reaching 52% household penetration by the end of 2003. However, significant growth is still expected as penetration in youth segments feeds through to older parts of the demographic. This section discusses the key trends relating to Internet access take-up across fixed Internet, mobile Internet and other access platforms.

Fixed line Internet penetration

Fixed line penetration will continue to be the main means of accessing the Internet. Household Internet penetration (narrowband and broadband) is forecast to continue to grow until 2008, plateauing at 63% (16m homes), from today's 52% penetration (13m homes).

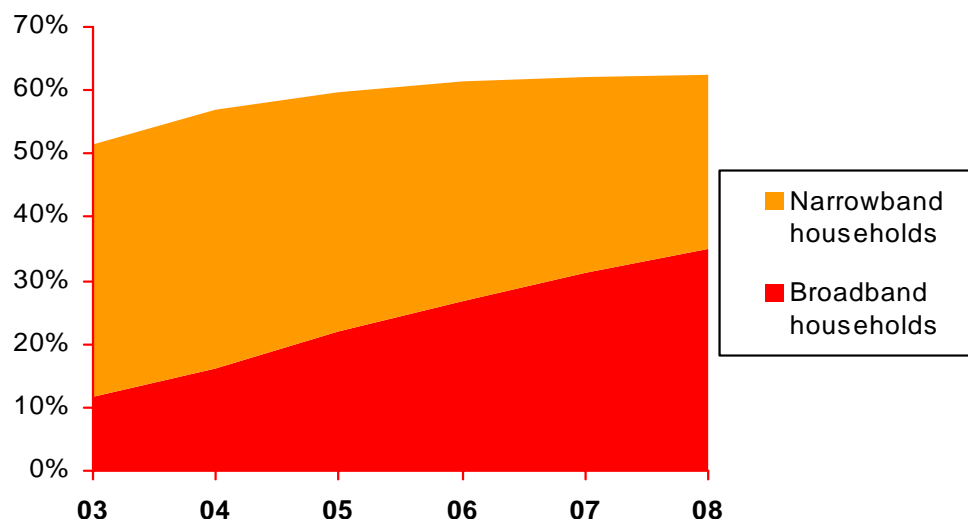
The take-up of broadband in the UK has been lagging behind other developed markets; recent falling prices have, however, created strong momentum for take-up, with around 2.5m broadband enabled homes in December 2003.

Fixed line broadband access is expected to be available universally by 2005 (currently available to 80% of the population), with the cost of broadband access falling by around 25% over the next five years to approximately £20/month.⁹

These developments are expected to help drive overall household broadband penetration to 35% by 2008, representing over half of all Internet connections.

The exhibit below summarises these forecasts.

Exhibit 13: Internet access penetration 2003-2008, broadband and narrowband



Source: Forrester, 2003

⁹ Spectrum analysis, based on industry opinion. Narrowband pricing has converged at between £10 and £15 per month and is now a commodity. It is expected that 1Mbps broadband will do the same around the £20 mark, subject to active regulation

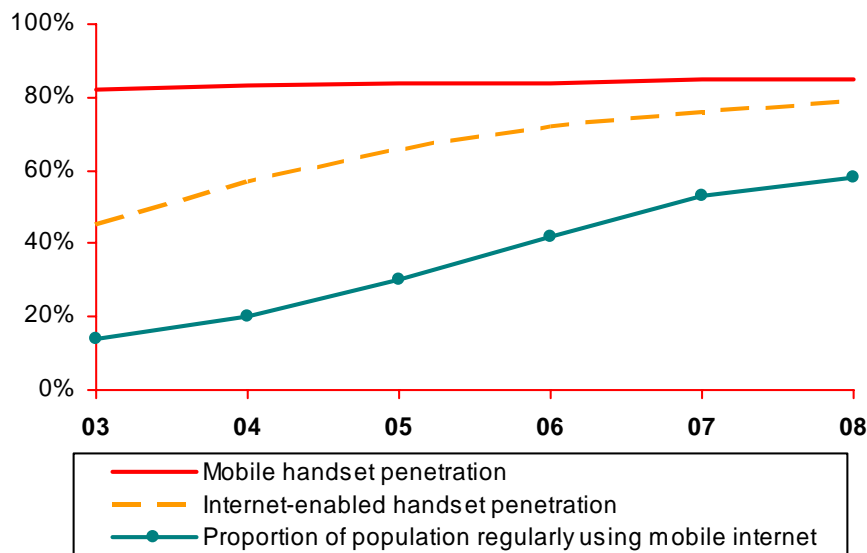
Mobile Internet penetration

Mobile phones already represent the largest installed base of consumer devices (48m in UK) and are expected to become almost ubiquitous.

Going forward, mobile manufacturers will increasingly produce Internet enabled handsets and this, coupled with the normal cycle of churn and handset replacement, will create a very large base of Internet-enabled mobile phones, reaching approximately 79% of the population by 2008.

The actual number of users will, however, lag the penetration of Internet enabled phones. Today, only 9% of all fixed line Internet users have also accessed the Internet through a mobile phone.¹⁰ Nearly 60% of the population are forecast to use their mobile device for public Internet access (which we take to be the best proxy for 'mobile Internet penetration') by 2008.

Exhibit 14: Mobile Internet penetration



Source: Informa, Forrester 2003

Other Internet access platforms

The most significant alternative method of access for households is expected to be web-based television (webTV). webTV is currently used by 6% of Internet users to access the web.¹¹ Penetration has been limited by a highly limited proposition available over TV: only a small amount of content is available (for example, Freeserve's web TV proposition has always only offered a sub-set of the content on offer on the PC version); pages do not display properly; and the user interface is not particularly well designed or intuitive to use.

There is the potential for a step change in web-over-TV propositions if set top boxes with built-in broadband connections (such as the recently launched BT i-player product) are widely adopted. This would enable the provision of audio/visual content (such as pay-per-view on demand services, movies and programme

¹⁰ Office of National Statistics 2003

¹¹ Office of National Statistics 2003

archives), as well as web pages, to be displayed and consumed through the TV. Such a change would require cooperation between broadband providers and set top box manufacturers.

Other broadband access technologies that will be available include:

- Fixed wireless access (yet to be launch in the UK). The most likely player in this market is BT; given its stated focus on fixed line access, it seems unlikely to become a major access technology
- Satellite broadband has been plagued by high costs of provision and technical problems, predominantly surrounding the asymmetry of the system – satellite can deliver high downstream bandwidth, but a standard modem has to be used for the upstream requests. The technology could become popular, however, in areas which other broadband technologies cannot reach, such as remote islands

Conclusion

Penetration of fixed line Internet services will grow strongly over the next five years, with broadband subscriptions accounting for much of this growth. Mobile Internet penetration will also grow rapidly and will approach the same levels as fixed line. Other means of access - such as webTV, satellite broadband and fixed wireless access - will have limited penetration, but are likely to be used to cover geographical areas where broadband or mobile internet access are unavailable or uneconomical.

4.2 Access to and usage of online services will continue to vary amongst different socio-economic and age groups

The government will broadly meet its target (set in 2000) of universal Internet access by 2005, with 96% of Britain’s population now aware of a place where they can readily use the Internet¹². Yet, even as the Internet moves towards becoming a widespread medium, the basic levels and patterns of Internet access and usage continue to vary across socio-economic and age groups.

This section discusses the differences that exist amongst socio-economic groups, in terms of access (household vs. public use), and use of services across different socio-economic and age groups.

Variation in access across socio-economic groups

Whilst public Internet access is providing a safety net for those who do not have home access (3m people have recently accessed the Internet in a Library¹³), there is a clear class or “digital” divide in home based access:

- Nearly two thirds of all 12.6 m households connected to the Internet are in the ABC1 category. The percentage of households in the DE category that are online is 40% lower than the overall percentage of households in the DE category
- 81% of Internet users in the DE group gain access outside of the home, compared to just 40% in the AB group¹⁴
- Low income households (i.e. DEs) are 7 times less likely to be online that those in the top income groups¹⁵

Exhibit 15: Internet penetration of UK households by socio-economic group

Socio-economic group	% of all UK households	% of UK Internet households	Variance
AB	21%	30%	+ 9%
C1	27%	30%	+ 3%
C2	22%	22%	-
DE	30%	18%	-12%

Source: Continental Research, 2003

The level of fixed line home Internet penetration is currently limited largely by the level of penetration of PCs in the home – a particular problem for DE groups, as a significant proportion of these homes do not own PCs. This is, in part, because the average price of PCs is relatively high (typically, around £500 for a standard desktop) and has remained fairly constant over time (although capabilities have increased significantly) - and is also forecast to do so over the next five years. Home PC-based Internet access is seen as key to more sophisticated patterns of usage: typically, home users spend longer online and use a wider range of services.

Efforts have been made by Government to boost penetration by promoting ownership schemes that lower the cost of PCs. To date, however, uptake of such offers has been limited and overall PC penetration is expected to show relatively limited growth, from 66% in 2003 to 71% by 2008.¹⁶

¹² New Internet Survey, Oxford Internet Institute, Sept 2003 (reported in UK Online annual report 2003)

¹³ ONS Internet Access Survey, Sept 2003

¹⁴ Continental Research 2003

¹⁵ ONS Internet Access Survey, Sept 2003

In contrast, penetration of digital TV and mobile services amongst DE socio-economic group is much more in line with the split of population across demographic groups.

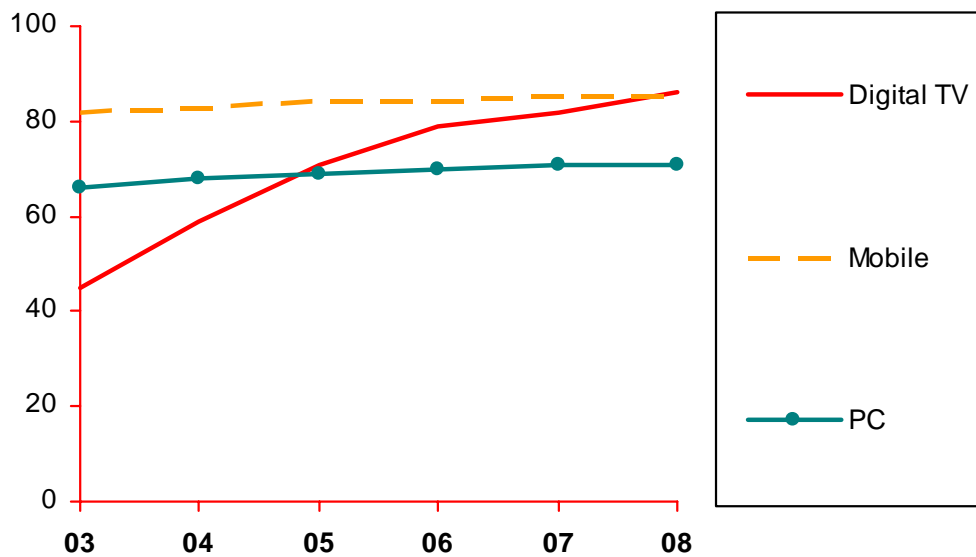
Exhibit 16: Penetration of alternative Internet access methods

Socio-economic group	% of population	% of mobile owners	% of digital TV viewers
AB	21%	25%	22%
C1	27%	30%	30%
C2	22%	21%	25%
DE	30%	24%	23%

Source: Continental Research, 2003

Given the current and forecast levels of digital TV and mobile penetration, these platforms offer higher potential reach for delivery of Internet access than PC-based access.

Exhibit 17: Penetration of PC, Mobile and Digital TV platforms



As discussed in section 4.1, we expect mobile Internet access to become widely available, with 58% of owners using services by 2008. It is, however, unlikely that Internet usage amongst lower socio-economic groups via mobile will fully redress the “digital divide”, given the likely cost of access.

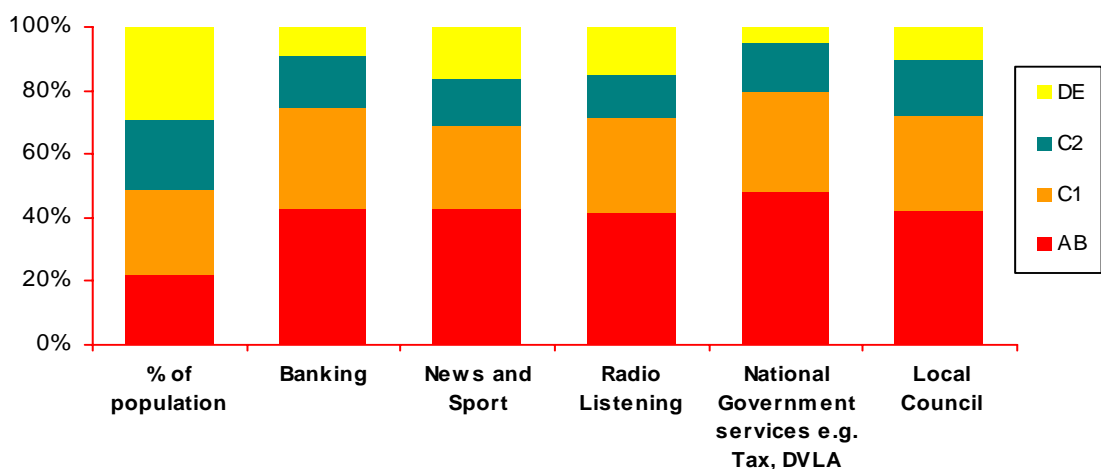
Internet access via digital TV (webTV) also has the potential for redressing the balance - but, as discussed in section 4.1, webTV penetration is not expected to have much impact, given current service offerings. There is potential for this to change if take-up of broadband-connected PVR set-top boxes (STBs) becomes significant – which could happen if the prices of such STBs falls, as has been the case for all recent generations of STBs (e.g. for satellite and cable pay-TV services). This could lead to a large increase in the level of home-based Internet access amongst lower socio-economic groups, where pay-TV (and, by extension, STB) penetration is significantly higher than PC penetration.

¹⁶ Forrester, January 2003

Service usage by socio-economic groups

Differences in service usage across socio-economic groups are even larger than the disparity in access. Usage of more sophisticated services (e.g. banking, news and sport) is disproportionately weighted to higher socio-economic groups; this is, in part, driven by low levels of home access in lower socio-economic groups, and higher dependency on public access, which is generally used for more basic web applications (e.g. e-mail). As growth in home PC penetration of lower socio-economic groups has already slowed, the medium-term potential for this disparity to be reduced is limited.

Exhibit 18: Consumption of advanced Internet services in the last 12 months



Source: Continental Research 2003

Service usage by age groups

Differences in participation in online activities across age groups are also emerging. For example, 16-34 year olds are much heavier users of services such as instant messaging services (37% of all 16-34s) and online games (27% of all 16-34s) than other age groups; whilst 29% of 35-54s shop online (a significantly higher share than in other age groups); and the majority (65%) of over 55s use the Internet for e-mail and general browsing, with a very low proportion of this group regularly using other applications.¹⁷

Conclusion

The disparity in the level of home Internet access across socio-economic groups is likely to persist over the next five years. The relatively high cost of mobile Internet access in the foreseeable future is also likely to limit access and usage levels amongst lower socio-economic groups. A “digital divide” in access to the Internet, therefore, may continue to develop. The greatest chance of this divide being redressed lies in the potential take-up of Internet-enabled digital TV set top boxes.

As has been seen (with fixed access) to date, lower socio-economic groups, as a result of their greater reliance on public access, will, on average, limit Internet usage to more basic applications (e.g. e-mail), whilst younger user groups will adopt new services such as games and streaming services more rapidly.

¹⁷ Forrester, 2003

4.3 Overall time spent on the Internet will increase by over 60% by 2008, with audio/visual services accounting for a large share of growth in usage

Overall growth in Internet penetration has also been accompanied by increasing use of online services: the Internet has become the third largest medium (in terms of time spent using it) after TV and radio. This section discusses the key trends relating to usage of the Internet in terms of time spent and services used (over both fixed line and mobile platforms).

Trends in average levels of usage of different media

Fixed Internet and mobile have been the two fastest growing media (in terms of usage) over the last five years, largely owing to rapid penetration growth of these platforms. This trend will continue in the next five years with growth in the consumption of Internet and mobile media services outpacing all other media to 2008, as illustrated in the table below. Growth will be driven predominantly by usage of new services (and, to a lesser degree, rising penetration of platforms). Online media consumption is still expected to be around double that of mobile consumption in 2008.

Exhibit 19: Leisure media time usage by medium 1998, 2003, 2008

Medium	2003 mins/ week	2008 mins/ week	Growth 1998 - 2003	Growth 2003 - 2008
Television	1,544	1,518	5%	-2%
Radio	1,359	1,379	23%	1%
Fixed Internet	140	234	324%	67%
Mobile	89	104	256%	17%
Print	80	74	-4%	-8%
Other (music, video, cinema, leisure software)	246	259	64%	5%
Total	3,458	3,568	20%	3%

Source: Screen Digest 2002

Remarkably, when office-based usage is taken into account, evidence suggests that Internet usage amongst Internet users has overtaken total TV consumption:

- Average use of the Internet stands at 3.5 hours per day on the Internet, compared to 2.8 hours per day watching television
- 44% believe that the Internet already offers better entertainment than television¹⁸
- Similar trends are evident in overseas markets. For example:
 - During 2003, US prime-time TV viewing for 18-34 year olds males has seen a fall of 12% – with an even more pronounced decline amongst 18-24 year olds of up to 20%.¹⁹ In contrast, Internet usage is increasing rapidly, with 75% of 18-34 year old males spending 32 hours online per week, compared to 27 hours amongst the Internet population as a whole²⁰

¹⁸ NOP, 2003

¹⁹ Nielsen Media Research, 2003, New York Times October 22 2003

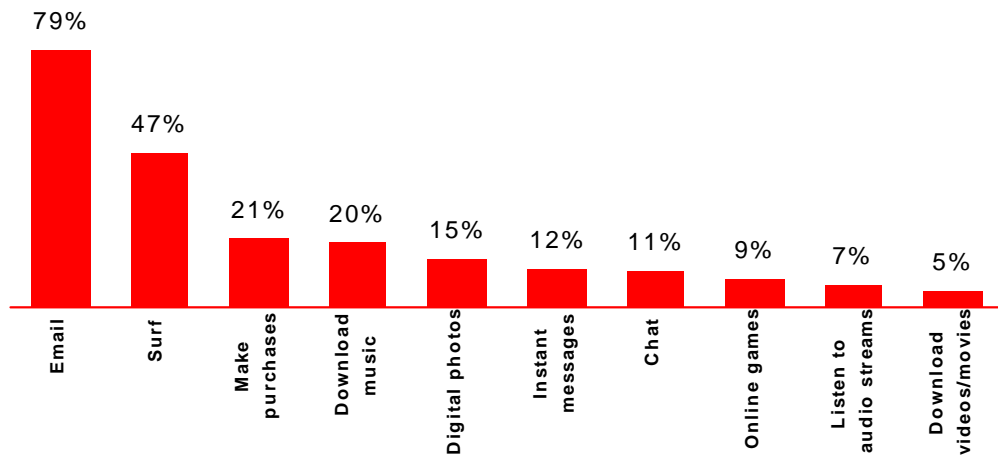
²⁰ Comscore Media Metrix October 2003

- In South Korea, where broadband penetration has already reached nearly 70% of households²¹, the average Internet user spends 22 hours per month online²²

Usage of audio/visual services over fixed Internet

Email and browsing, predictably, remain the most popular uses of the Internet, but music and picture downloads are now widely used applications, with games and video services growing in popularity.

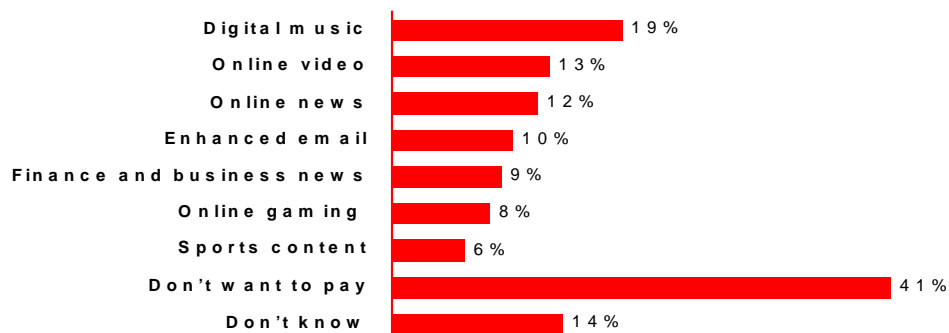
Exhibit 20: Internet usage in Europe⁽¹⁾



Note: (1) Question asked, "Which of the following do you do regularly online?"
Source: Forrester 2003

Usage of audio/visual services to date, has largely been dominated by (illegal) file sharing, music downloads and adult services. Consumers' usage of the Internet will, however, extend to more legitimate and mainstream sets of services, as these become more widely available; this is supported by the strong propensity to consume audio/visual services offline and the growing willingness to pay for audio/visual services online.²³

Exhibit 21: Willingness to Pay for Online Content and Services



Note: (1) Which of the following applications would you be willing to pay a fee for in the future?
Source: Jupiter Research 2003

²¹ Informa Media, 2003

²² Investigating Broadband deployment in South Korea, DTI/ Brunel University October 2002

²³ The Newspaper Society claims that over two thirds of those sites that already charge for content reported no change in visitor numbers following the introduction of content charges

Music, video and online gaming services will experience the greatest growth in popularity over the next five years (see section 4.4 for more detail on forecast content revenues for these services) and are already experiencing strong growth in usage:

- Legitimate online music services are becoming mainstream and successful; Apple's iTunes service has sold over 25m music tracks in the US since launch in April 2003
- Online video services have been launched, particularly in the US, where 'Real Superpass' has 900,000 subscribers and provides content such as ABC News, FoxSports, Major League Baseball and Nascar
- Online gaming has so far been limited to a small group of 'hardcore' users with very high usage. For example, the online game "Everquest" has just under half a million subscribers and players reportedly play for an average of 22 hours a week.²⁴ However, both peer-to-peer file sharing networks and online console gaming (driven by Sony Playstation and Microsoft Xbox broadband-enabled products, with 80,000 and 30,000 broadband gamers in Europe, respectively) will serve to drive (broadband) gaming consumption

Overall, whilst Internet consumption has been driven by basic applications, such as email and browsing, to date, music, video and gaming services are likely to be the core drivers of fixed Internet usage (especially broadband) over the next five years.

Usage of audio/video services over mobile

Media consumption on mobile has been limited to date, but this is expected to change, with the growing take-up of 2.5G handsets and the ongoing roll-out of 3G services. Already, mobile operators have launched a wide range of basic audio and video services: for example, O2 has launched a service that allows users to download full tracks at similar quality to FM radio using its 2G network, whilst the latest Vodafone Live! handsets have RealPlayer pre-installed to allow audio and video streaming.

Given the particularly high penetration and 'cultural' popularity of mobile phones in the youth segment, music, sport video and gaming services are expected to become popular services on mobiles, although messaging and general information search will remain the 'core' mobile content services over the next five years.

These trends are reflected in the current strategies of mobile operators and device manufacturers:

- 'Three' has focused its marketing away from voice calls and towards entertainment services (e.g. Premier League football clips)
- Similarly, Nokia's latest handset, the nGage, a cross between a mobile handset and a handheld gaming console, is being marketed at young, tech savvy games players and allows multiplayer gaming over the mobile network and includes a media player capable of streaming video and playing MP3s

Conclusion

The next five years will see both fixed and mobile Internet usage increase considerably, with increases on both platforms being driven by more entertainment-oriented audio and video services, rather than by basic information searches.

²⁴ Screen Digest, 2003

4.4 Paid-for content and advertising revenues will grow rapidly over the next five years, as Internet and mobile platforms continue to mature as commercial media

To date, advertising and paid-for content revenues for both mobile and fixed Internet platforms have been relatively low, particularly when compared to the ‘core’ revenue streams of access and e-commerce. Mobile paid-for content revenues have significantly outstripped fixed Internet content revenues.

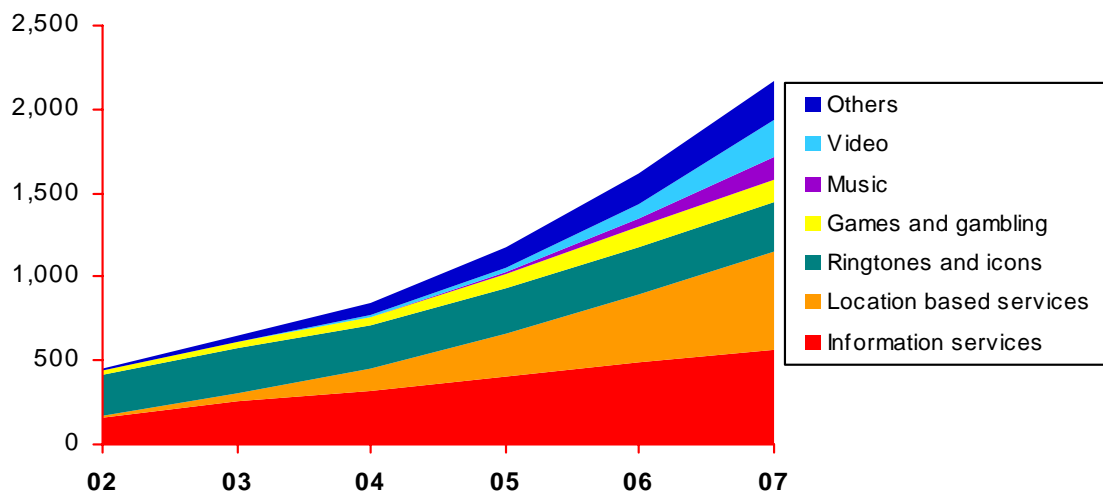
As the medium matures over the next five years, however, demand for online leisure/entertainment services will grow and will generate considerable growth in content and advertising revenues. This section considers the future prospects of the online market for paid-for content and advertising revenues.

Paid-for content revenues –mobile and fixed Internet

Mobile content revenues are set to remain far larger than UK online content revenues (£460m and £84m, respectively, in 2003). Both platforms are, however, forecast to undergo significant revenue growth over the next five years.

In the mobile sector, total paid-for content revenues will grow at an annualised rate of around 35% between 2003 and 2008. Information and location-based services are forecast to generate by far the largest share of overall revenues, but richer content services - such as music, video and games - will be popular and could generate nearly £500m of revenue by 2007.

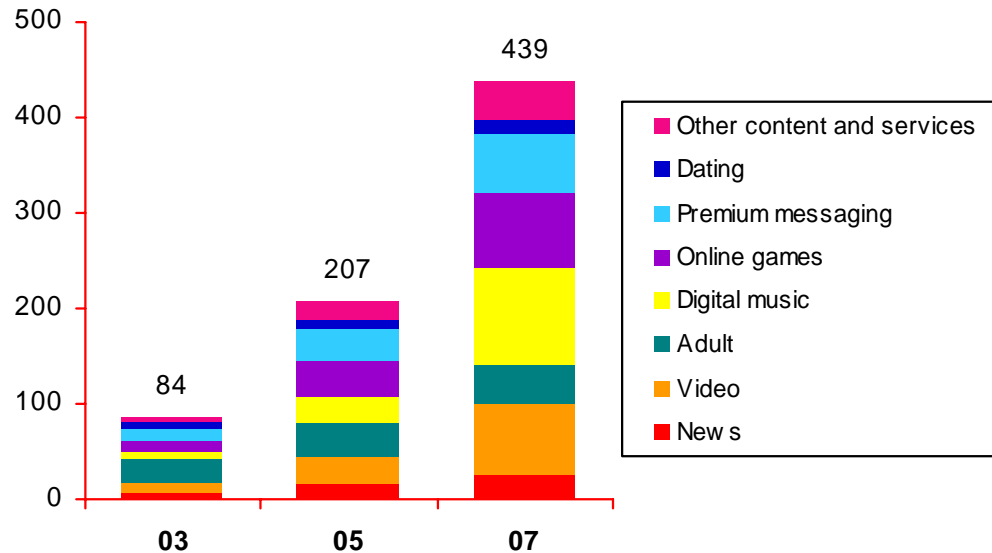
Exhibit 22: UK mobile content revenues by type (£m)



Note: Revenue from messaging services (e.g. SMS) were £1.2bn in 2002, forecast to reach £2.6bn in 2007
Source: Strategy Analytics, 2003

Paid-for content revenues via the fixed line Internet will grow at an annualised rate of over 50% between 2003 and 2007, primarily driven by increased demand for premium audio and video services. In particular, music, premium video, and gaming services will drive revenues - with paying customers forecast to generate £104m, £72m, and £77m, respectively by 2007. Together, these services are forecast to account for £253m of fixed Internet content revenues, representing almost 60% of total online content spend in 2007.

Exhibit 23: UK fixed online content revenues by type (£m)



Source: Jupiter 2003

Internet advertising

As people (especially younger age groups) spend more time online, the fixed Internet will become a more attractive medium to advertisers than has been the case in the past three years and an important part of their overall multi-media strategy. Many traditional offline companies are already spending a higher share of their budget online: in 2002, more than half of Internet advertising spend was accounted for by traditional offline companies.²⁵

Overall, fixed Internet advertising is set to double from its current levels by 2008 – although, relative to other media, online advertising’s share of the market will remain low (around 3% in 2008; this figure is higher than other European markets, but lower than in the US).²⁶

Exhibit 24: Internet’s share of the overall advertising market (£m)

Medium	2003 (£m)		2006		2008	
TV	3,152	31%	3,574	31%	3,930	31%
Press	5,639	55%	6,107	53%	6,633	53%
Radio	427	4%	527	5%	597	5%
Cinema	156	2%	179	2%	197	2%
Outdoor	617	6%	793	7%	908	7%
Internet	211	2%	275	2%	331	3%

Source: Zenith Optimedia, March 2003

²⁵ Campaign April 2003

²⁶ Internet share of ad spend in other countries in 2003: USA 5.2%, France 1.4%, Germany 1.0%, Italy 1.4%, Spain 1.0%. Source: Zenith Optimedia, December 2003

The Internet's share of advertising does, however, have the potential to exceed current forecasts, as formats and attitudes change:

- Paid search (31% of total UK spend in 2002)²⁷ – search allows advertisers to develop highly targeted campaigns, based on keyword searches in major portals and search engines
- Rich media advertising – new richer advertising formats are proving more successful than traditional banner ads; they can, for example, often be displayed as “interstitials” (temporarily covering the screen). Video advertising is another potential area for growth, as broadband penetration grows and video content becomes more common on the Internet, either in the form of ‘in-content’ advertising, video banner ads, or microsites²⁸
- Industry bodies (e.g. the Interactive Advertising Bureau) are becoming more active in the promotion of the industry – in a similar way to the development of Radio Advertising Bureau that successfully improved radio's share of total advertising during the 1990s

Together, these factors may drive Internet advertising revenues to grow faster than forecast above.²⁹

Overview of other online market revenues

The other key revenue streams of the fixed Internet medium are access and e-commerce revenues; these are forecast to remain by far the two largest revenue sources on the Internet over the next five years. Both revenues streams are set to continue growing strongly:

- Growth in fixed Internet access revenues will be driven by increasing Internet penetration and migration to broadband
- Retail transactions will continue to shift to the Internet in certain product categories – for example, software (28% of total sales by 2007 online); PCs and laptops (34% by 2007); media goods, including books (16% by 2007) and music CDs (16.1% by 2007)³⁰

Exhibit 25: Summary of key UK online revenues (£m)

Revenue Source	2003	2005	2007	% growth 2003-2007
Content and Services	85	210	445	421%
Advertising	211	266	313	48%
Access	2,042	2,345	2,457	20%
E-Commerce	6,198	10,107	14,527	134%

Source: Jupiter 2003, PWC 2003

Conclusion

Whilst access and e-commerce revenues will continue to be the core revenue streams in the fixed Internet world, advertising and – in particular – paid-for content revenues are forecast to grow rapidly over the next five years, on both fixed (broadband) and mobile Internet platforms. The fastest growing revenue streams will be those generated by premium music and video services, followed by online and downloadable gaming services.

²⁷ IAB, 2003

²⁸ Forrester 2003

²⁹ IAB's submission cites forecasts of UK advertising revenues of over £500m in 2007

³⁰ Jupiter Research, 2003

5 Key trends in supply

Summary

There are a number of drivers that will play a role in shaping the overall UK Internet supply market over the next five years. First, as the Internet becomes a technically viable medium for content, leading rights holders are increasingly looking to exploit the value of their content on the Internet, as well as in traditional media. Second, with many rights holders based in the US, the dominance of US providers in the online content market will be reinforced. But, as users become more experienced and look for a wider range and more specific types of content, search tools will become central to the usage of the Internet. This will be enabled by advances in search technology, enhancing the usefulness of search engines; search providers will, also, add extra features to their sites, such as email and shopping tools.

The following hypotheses highlight these movements in the supply side of the market. They are discussed further in the remainder of this section.

- Premium rights holders and content providers are increasingly looking to exploit the Internet as a commercial medium – especially through the provision of audio/video content services
- Supply of English language content to the broadband market will be led by US players
- Search tools will become central to usage, acting as a gateway to content

5.1 Premium rights holders and content providers are increasingly looking to exploit the Internet as a commercial medium – especially through the provision of audio/video content services

Until recently, uncertain business models, limited bandwidth, and widespread piracy have meant that the Internet has remained relatively unexploited by major media companies for the distribution of audio-visual content. The Internet, however, is now developing into a major commercial platform for premium content providers, in part, as a result of the technology and demand trends described in the previous sections.

This section highlights the likely developments amongst premium rights holders and content providers and the content services being created for broadband and mobile distribution platforms. It also briefly considers the way in which content owners are attempting to segment their rights across different media.

Broadband content services

A range of operators within the media industry are now developing commercial broadband channels for audio and video content. Some of these developments are highlighted below, as indicators of the growing commitment of major players to the online medium.

- Within the music industry, 'i-tunes' (owned by Apple) has quickly become a leading player in the distribution of online music content over the Internet. i-tunes has formed licensing agreements with several music labels and now hold over 400,000 tracks in their library, available to download and burn to CD. In the US, it has sold over 25 million music tracks to the Apple computer use base, since its launch in April 2003. Other license-based services have followed suit - such as Roxio Napster 2.0, MusicMatch and Buymusic in the US, and, in the UK, services from HMV, MTV and AOL UK, amongst others
- The fledgling success of i-tunes and other similar services has demonstrated to the music industry that models for the legitimate distribution of music over the Internet are possible. As service propositions and business models for legitimate services develop, major labels and independents will look to exploit the full value their back-catalogues online and, over the next five years, it is likely that the commercial supply of music-related content will continue to grow rapidly³¹
- Online film services are still very limited – primarily as a result of the limited ability of (narrowband) users to download large movie files. In future, greater bandwidth and improved compression codecs will reduce this barrier. The movie industry has already begun to develop legitimate commercial models for movies delivered over the Internet. Movielink, launched one year ago with backing from five of the major studios, provides movie downloads for \$2.95 to \$4.95, using a 24 hour 'rental' model; it has seen sales increase by at least 25% each quarter during 2003.³² There are already a number of similar services from competitors, such as CinemaNow
- Other premium commercial services are focusing on sport (Sky already has a subscription broadband football highlights package) and gaming content

Broadband ISPs are also launching premium content packages in partnership with rights owners, for example:

- NTL has recently launched a 15 channel package of web content for its broadband subscribers. NTL Broadband Plus offers exclusive content from the BBC, MTV, and the major record labels for £3.99 per month, on top of regular broadband subscription³³

³¹ As a historical example, the music download service MusicNet launched in December 2001 with 75,000 tracks available for download. The Roxio Napster 2.0 service launched in October 2003 with 500,000 tracks

³² Information Week, October 2 2003

³³ Company data 2003

- AOL UK is relying heavily on exclusive video content from major franchises - including Big Brother, Wimbledon and the RFU World Cup - to attract subscribers³⁴
- In the US, RoadRunner has signed a deal with Movielink to provide its services on a co-branded basis³⁵

The current level of commercial provision of broadband content services and packages, marketed as premium subscription services, provides clear evidence of the future strategic approach of major content providers in the broadband market. As broadband penetration increases from current low levels (as discussed in section 4.1 above), the commercial attractiveness and significance of the online market to content providers will increase rapidly.

Mobile content services

A similar pattern of premium content development is emerging in the mobile sector and audio-visual content is already playing an increasingly important role in mobile service propositions, as is evident in the commercial activities of both content providers and mobile operators.

Content providers are rolling out a range of mobile-tailored services:

- The music industry is licensing its rights to aggregators, such as Musiwave and Buongiorno-Vitiminic, allowing them to supply ringtones and music downloads based on their content and charged at premium prices (up to £3)
- Major television companies and film studios are developing mobile services based on their franchises – for example, the ‘Fawlty Towers’ video clips, provided by the BBC to Vodafone

Operators and handset manufacturers alike are using rich premium content to differentiate their offerings:

- O2 has recently launched a music download service, using a compression technology that allows tracks to be downloaded onto a separate player in 90 seconds, using GPRS network technology, with agreements signed with the four major record labels³⁶
- The handset manufacturer Motorola recently struck a \$75 m deal with MTV to supply branded content to be embedded in its handsets, whilst Nokia has been active in licensing content from a range of providers, including Universal Studios and Lucasfilms³⁷
- In Japan, Disney has, since 2000, acted as a key mobile content partner for NTT DoCoMo, providing content based on their brands to over 2.5 m subscribers. Disney has a specific unit, Disney Mobile, with in-house content development teams³⁸

Whilst limited capabilities of handsets have to some degree held back the development of compelling content propositions, the widespread take-up of 2.5G (GPRS) handsets and the ongoing roll-out of 3G is stimulating content suppliers and rights holders to develop new services. These are already yielding significant commercial returns (as discussed in section 4.4). Over the next five to ten years, services will continue to develop rapidly, as both mobile-Internet penetration and usage levels of mobile services increase.

³⁴ Press reports, company data

³⁵ Press reports

³⁶ Informa 2003

³⁷ Press reports, company data

³⁸ Baskerville 2003

Rights segmentation

To date, the sale of content rights (such as sport content) to third party service providers (such as broadcasters) has been focused on TV, radio and TV highlights. Increasingly, rights holders are seeking to exploit the market for mobile and Internet rights, by carving out specific packages for these platforms.

A good example of this approach is The Premier League, which has already incorporated new media channels into its overall packaging and sale of rights, as summarised in the exhibit below.

Exhibit 26: FA Premier League rights segmentation 2004/5-2006/7

Medium	Package	Buyer	Details
Television	38 Live matches	BSkyB	First choice of live Sunday matches for broadcast
Mobile	Clips of all 380 matches	Vodafone/Three	Clips available from five minutes after the end of each match
Web	Clips of all 380 matches	BSkyB	Midnight after each match, 5 minutes of clips per match

Source: FA Premier League, press reports

Major League Baseball in the US has also segmented its rights by medium: for the past two years, the League has sold full online audio feeds and video highlights and, in 2003, offered full live webcasts of 1000 games (subscribers pay \$79.95 for a season or \$2.95 for an individual game).

Premium rights holders with compelling content are already extracting additional value from their content by creating new rights windows for broadband and for mobile. Increasingly, separate mobile rights, in particular, are likely to be of particular value, especially for time critical content (e.g. live sport or news).

Conclusion

The Internet is already being exploited by premium rights holders and content providers to a significantly greater extent than a few years ago, particularly through the provision of audio and video content services. The continued growth in capability, take-up, and usage of the online medium makes it a genuine alternative to TV and radio for the distribution and sale of premium content. As a consequence, rights holders will become more advanced in the way they segment, window, and distribute their content across broadband and mobile Internet platforms.

5.2 Supply of English language content to the broadband market will be led by US players

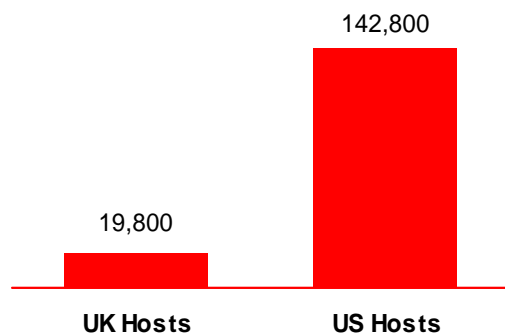
The Internet is a borderless medium, with no barrier or demarcation to indicate where content originated by one country ends and another begins; this creates larger markets for products and services that have traditionally been seen as territorially focused and/or confined. The impact on the market for English language content is, of course, particularly marked.

This section discusses the supply of online content to the UK from the US, in both the fixed line and the mobile Internet environments.

US supply of fixed Internet content

Online content consumption in the US is much greater than in the UK. There are 250m English speakers in the US, compared with the 60m UK population, and the two countries have comparable levels of Internet penetration. The level of US content production is, therefore, much larger than in the UK and US content suppliers far outnumber UK players. This is illustrated by the disparity in number of hosts (even adjusting for the differences in population).

Exhibit 27: Total number of Internet hosts



Source: ITU, 2003

This disparity in supply translates across to into UK consumption patterns, with the majority of the most popular sites being either US-originated or US-owned.

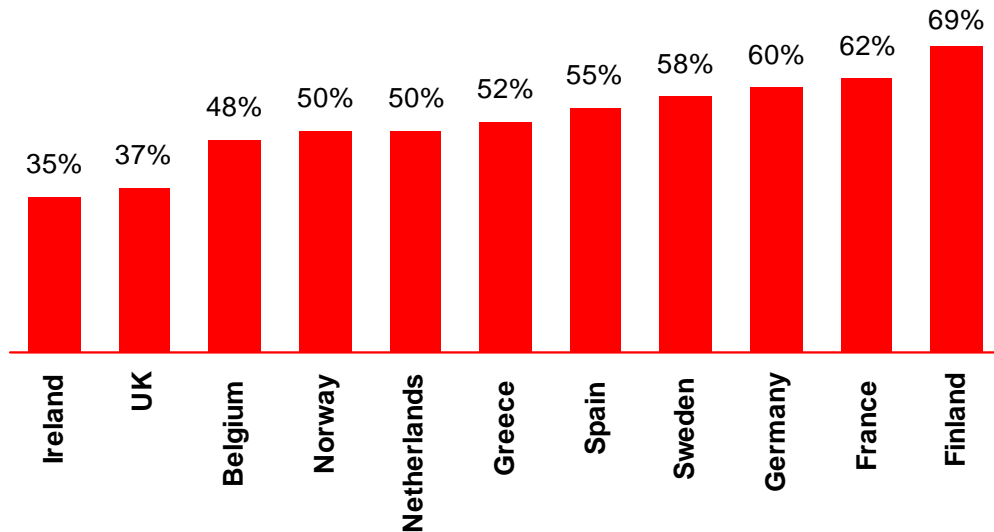
Exhibit 28: Market share of leading websites used in the UK

	Market share (% of visits in the last ten months)
Microsoft domains (msn.com, msn.co.uk, passport.com)	41%
Yahoo! domains (yahoo.com, yahoo.co.uk)	20%
Google.com	11%
bbc.co.uk	9%
Freeserve.com	8%

Source: Nielsen NetRatings, December 2002

This dominance in the supply and consumption of US content is primarily the result of having English as a common language. Other European countries consume a far higher amount of domestically generated content, compared to the UK and other English speaking countries (such as Ireland).

Exhibit 29: Local sites as % of the top 50 websites



Source: Technopolis Group, 2003

As the Internet becomes a more important channel for distributing rich, interactive audio-visual content, the competitive value of owning premium content will increase, production costs will rise, and economies of scale will also grow.

All of these factors will favour US (versus UK) suppliers: they own a larger share of the most popular premium content; they have access to large budgets, can diversify risk over a large production slate, and are able to establish large user communities; this comparative advantage is already evidenced in the much more mature film industry, which similarly favours US producers: in 2002, 543 films were produced in the USA, compared to just 84 in the UK.³⁹

Mobile content

The dominance of US providers in the fixed Internet arena is not as marked in the mobile market, for a number of reasons:

- The US market adopted a network standard different to that of Europe and most of Asia, alienating it to some degree from the international market
- Mobile penetration has been slower to develop in the US than in Europe and, therefore, the demand for mobile content has been lower
- The nature of mobile usage (time and location specific in a way that fixed Internet usage is not) means that localised content is more relevant – and, thus, more in demand (e.g. business search, directions, traffic news)

³⁹ European Audio Visual Observatory, 2003

Given the lag between the US and UK mobile markets, the impact on the UK content market of US content providers is likely, over the next five years, to continue to be smaller than on the online market.

Conclusion

The provision of broadband Internet content will continue to be led by major US players over the next five years, given their existing commercial and cultural prominence in the UK market and their dominance of major media distribution outlets. Mobile content, however, is likely to remain predominantly domestic in origin, given the continued differences between the US and UK mobile markets and the value of localised, market-specific content on a mobile phone.

5.3 Search tools will become central to usage, acting as a gateway to content

As Internet users become more experienced (in both the fixed and the mobile environments), they also become more particular about the specific types of content they are trying to find. Mainstream content aggregators cannot serve the diverse interests of a mass Internet market; consequently, users seek out specific, often niche, 'end destination' content sites.

As a result of this ongoing change in user behaviour, search tools are playing an increasingly important role in shaping online consumption patterns, as they help users find individual sites for which they are looking. Search providers are, therefore, becoming significant market players, driven by:

- The overall growth in usage of search engine sites
- Advances in online search functionality
- Strategic development of additional content services by search providers

Each of these is now considered in turn.

Growth in usage of search engine sites

Search tools are already central to many users' online consumption and will continue to grow in importance and relevance to the overall online user base. As the web population becomes more comfortable with the Internet, the demand for a 'home page' (an edited content-rich page that links users to the latest and/or premium content) is diminishing. Users are displaying less loyalty to such aggregator portals (e.g. that of their ISP) and are coming to the Internet with a specific purpose in mind (such as checking the news, researching a particular topic, purchasing a product), rather than just to 'browse the web'. To do this, they either go to a particular destination immediately, by entering its URL, or they use a search engine as their entry point.

As evidence, global site referrals from search engines doubled between 2002 and 2003 to 13% of all site visits.⁴⁰ Moreover, the reach and total number of users of search sites has grown, on average, by over 150% per year since 2000, compared to a 50% growth rate in users of, for example, entertainment sites.

Exhibit 30: Growth in number of search site visitors, compared to other sites

Category of site	Visitors	Reach	Growth of visitors CAGR
	2002 (000s)	2002	2000-02
Search e.g. google.co.uk	9,055	56%	159%
Directories e.g. streetmap.co.uk	7,422	46%	102%
Retail e.g. tesco.com	8,573	53%	66%
ISPs e.g. Freeserve.com	12,827	80%	62%
Portals e.g. MSN.co.uk	12,965	80%	57%
Entertainment e.g. virgin.net	9,623	60%	50%
Business e.g. egg.com	6,571	41%	42%
Corporate sites e.g. bt.com	9,611	60%	26%
Services e.g. gator.com	10,845	67%	23%

Note: Reach is the number of visitors expressed as a percentage of the total Internet population

⁴⁰ Websidestory 2003

Source: Jupiter MMXI, UK at home panel, Feb 2000, 2001, 2002

Google is, arguably, the most popular pure search tool and acts as a major international gateway to the web, with 200m searches per day and 39m unique visitors per month.⁴¹ Microsoft, not currently a player in the search market, is developing its own search technology currently know as “MSNBot”.

The importance of search is, also, demonstrated by commercial market trends. For example, in 2003, Yahoo (which previously used Google as its supplier of search) acquired both Inktomi (a major developer of search engine technology) for \$235m and Overture (owner of major search engines ‘alltheweb’ and Alta Vista) for \$1.6 billion. Search is moving rapidly from being a utility to a revenue generating advertising platform: around one fifth of Yahoo’s revenues in Q1 2003 were generated by paid search.⁴² European paid search revenues (generated by sites paying search providers for listings and, in some cases, prioritisation of their URLs) are forecast to increase from €140m in 2002 to €363 million by 2005.⁴³

Advances in online search functionality

Alongside advances in the popularity of search engines, the enabling technology behind these tools is advancing, driving the ‘quality’ of search engines (i.e. their ability to return results that are most relevant and tailored to the user).

For example, metadata standards are being introduced to provide web site managers with a common way of classifying and identifying their site to others. A common and rigorous system of classification will make the relevant web pages easier to find. In the UK, government is backing the Dublin Core metadata initiative to classify government sites consistently. New technologies will personalise data according to users’ search history and geographic location and ‘intelligently’ ask questions to refine searches.

The table below summarises likely developments in search tool capabilities over the next three years.

Exhibit 31: Capability of search tools

Today	Three years from now
<ul style="list-style-type: none"> • Semantic features (spelling correction, common replacement words) • Basic family filters based on keywords and blocked site lists 	<ul style="list-style-type: none"> • Complex filters, based on genre / nature of content • Thesaurus (searching for other words with the same meaning as the search term) • Taxonomy (searching within and around the category of the search term) • Intelligence engine (interpreting natural language queries and asking questions back to the user to increase the relevance of the results) • Personalisation (remembering previous searches by that user and tailoring future searches to their needs) • Geographic relevance (providing tailored results based on the precise geographic location of the searcher)

These developments will increase further the attractiveness and value of search tools to the end user.

Development of additional content services by search providers

The growing importance of search functionality is likely to be a significant factor in the future strategies of leading online players. Popular search sites can be expected to develop added features (such as image, news

⁴¹ emedia 2003

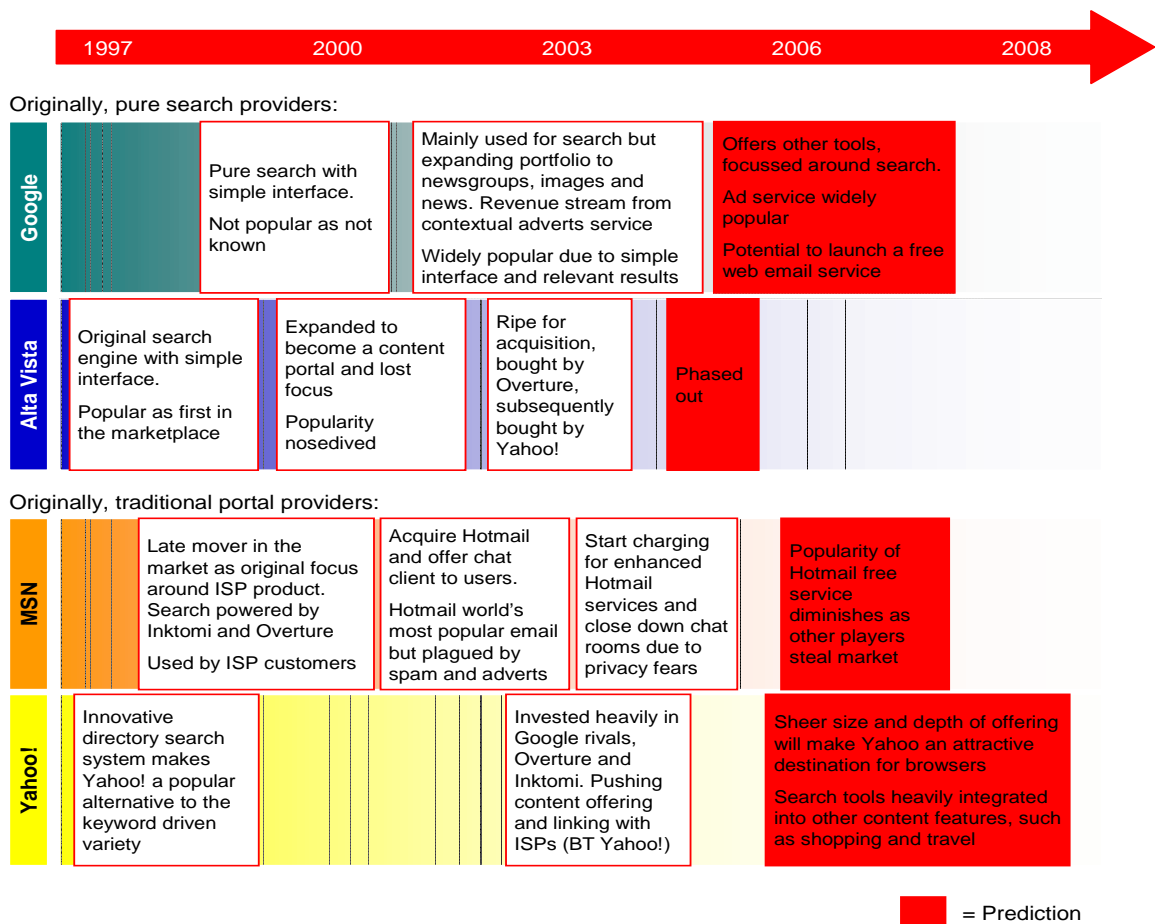
⁴² Paid search in Europe, Jupiter Research, Jan 2003

⁴³ Jupiter 2003

and shopping search) and extras tools (such as email, contacts and calendar), but are less likely to move into the high cost and high risk area of content service creation and development.

The following exhibit illustrates how particular online players have evolved. It summarised how sites that were originally 'pure' search tools have become more like the portals of the early days of the Internet, offering increased functionality but no self-produced content, whilst the traditional portal players are becoming more like destination sites with their own content. The contrast between the evolution to date of AltaVista and Google is particularly striking: Google has succeeded by remaining a clutter-free 'simple' search engine, whilst AltaVista failed by trying to become all things to all people. The exhibit also provides some tentative suggestions of likely developments over the next few years.

Exhibit 32: Evolution of online players



Source: Company data, Spectrum analysis

Conclusion

Search services and sites are set to be an important and highly competitive area of the online market over the next five to ten years. Usage of search tools will continue to increase, as they become more central to the browsing process, the technology behind them enhances the relevance of the responses, and additional features make them more attractive and sticky destinations. It is likely that Google and Yahoo! will remain dominate players in the search arena over the next five years, although Microsoft is also looking to grow its presence in this area.

6 Conclusion

The combined effect of the forecast trends in technology, demand, and supply set out in this paper will create significant step changes in the operation of the online market, particularly in the range and depth of services available, in online consumption patterns, and in the commercial market ecology.

In some ways, the type of content available and the ways in which content is consumed will mirror more closely today's broadcasting media. As online technology continues to evolve, many broadcasters and suppliers of broadcast content are expected, increasingly, to view the Internet as a complementary medium to TV and radio.

These trends and developments have significant implications for the future remit of BBC Online and its role within the wider online ecology. They will inform the Review's consideration of a number of key questions about, for example, BBC Online's core purposes, its operational delivery, and its potential market impact.

Exhibit 33: Key questions for consideration in light of future market hypotheses

Area	Key questions
Purposes and remit	<ul style="list-style-type: none"> • Are there grounds for public intervention? <ul style="list-style-type: none"> – to what degree would the commercial sector provide this service of its own accord? (today and in the future) – even if there is an existing market for this service, or one is likely to be created, is there still value in having public provision of this service (for example, to ensure quality and competition)?
Corporate strategy	<ul style="list-style-type: none"> • Given its remit, what specific services should BBC Online provide? • In addition, should BBC Online provide these services on new technology platforms, particularly mobile and broadband?
Operational delivery	<ul style="list-style-type: none"> • For each service, should BBC Online originate the content (or application) itself or outsource provision to others? • How much should the BBC spend on the different aspects of its operations?
Performance assessment	<ul style="list-style-type: none"> • How should BBC Online's performance in each service area be assessed?
Market impact	<ul style="list-style-type: none"> • What is the market impact of the BBC providing this as a public service?
Governance and regulation	<ul style="list-style-type: none"> • How should these services be approved, regulated, and reviewed?

These implications will need to be considered across the full range of services and activities that BBC Online currently provides and/or could, potentially, provide in the future. These include:

- News and public information
- Sport content
- Educational content
- Regional content
- Other programme-related content
- Community services and tools
- 'Trusted guide to the Internet' services
- Strengthening relationships with licence fee players
- E-commerce

Appendix – Glossary of terms

These definitions apply to the usage of the following key terms in this document.

Audio/visual services	Used to describe a whole range of services, including linear and on-demand audio and video content and online gaming
Bps / Kbps / Mbps	Bits Per Second / Kilobits per second / Megabits per second. Higher bps numbers imply faster data transfer speeds and hence a greater capability to offer richer digital services
Broadband	Fixed line access connection to the Internet delivered over DSL or over cable modem, at a connection speed of 150Kbps or above
Device	All devices, including household and portable devices (e.g. TV; PC; mobile handset; PDA)
DSL	Digital Subscriber Line: Technology used to deliver broadband services via conventional telephone lines (twisted pair copper) ADSL – Asymmetrical DSL, access speeds are faster downstream (receiving) than upstream (sending) VDSL – Video DSL, designed for video streaming services
e-commerce	The purchasing of goods/merchandise made online
GPRS	General Packet Radio Services – mobile phone technology allowing data between the mobile network and the handset. Sometimes referred to as '2.5G'
Mobile Internet	Content/services on the public Internet accessed via a mobile network
Online content/services	Content and services available on the public Internet, accessed via a fixed or mobile Internet
webTV	Access of content/services on the public Internet accessed via the TV, sometimes using a telephone line as a return path
PVR	Personal Video Recorder. A TV receiver that incorporates a hard drive to record programmes. Uses an electronic programme guide as the interface to select which programmes to record
Wireless LAN	Wireless Local Area Network - allows wireless local (e.g. up to 10m) transfer of data between one device and another (e.g. PC and TV)

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