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**Master of
Management in the Network Economy**



***A Roadmap for the development of
Personalised TV-based Services***

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Abstract

Telecom companies and other companies providing broadband internet services are increasingly looking towards developing new services to the home, that utilise a broadband connection, other than just providing fast access to the Internet. They are being driven by needs to maintain and increase their revenues. IPTV or Broadband TV through video-on-demand and other interactive services to the TV are now technically possible and many services are emerging throughout the world. However, business models for making such services sustainable and profitable are still being worked out. This paper describes the issues that need to be addressed by telecom and broadband service providers when developing a business plan for such services and draws a roadmap that could lead to the development of sustainable and profitable personalised TV-based services in the home.

This paper argues that in order to attract consumers willing to pay for these new TV services, a different kind of TV experience needs to be developed that focuses not just on people's passions, interests and emotions – but also in a way that saves them time and enables them to be in control of their time. It suggests that content needs to be aggregated and appear to be personalised around an individual's interests or multiple "trusted communities of interest".

A company planning new TV services therefore has to move from being a "utility service provider" to one that provides a total experience within the "experience economy". This will be critical as in many markets companies will need to clearly differentiate their offerings from what consumers already have access to in the form of a rich variety of interactive video content through satellite, cable and terrestrial TV service providers.

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1. Introduction

The purpose of this paper is to highlight the issues that need to be addressed towards developing a Personalised TV-based service in the home using a broadband connection. It aims to provide a roadmap to help telecom and broadband service providers when they are developing a business plan for a sustainable and profitable service.

This paper focuses on developing video-rich and interactive services to the TV in the home through Broadband TV or IPTV (Internet Protocol Television) using a broadband connection through an existing telephone line or through fibre optic cable. It does not focus on providing a TV-like experience to a personal computer. Although not ideal, the term IPTV will be used throughout this paper so as not to get confused with broadband TV delivered to the PC.

However, the paper will touch upon convergence issues as it recognises the increasing importance of interoperability enabling a person to have access through, and transfer content to multiple devices – the PC, TV, mobile phone, iPod or any personal digital organiser. New business models will emerge around such interoperability – but this is beyond the scope of this paper.

Section two summarises recent trends that are causing rethinking about the role of the television – from being a passive medium where content has been controlled by a small number of people – the broadcasters - to a point where viewers are increasingly having control over what they want to watch and have access to and when they want to have access to it. It describes the need for telecom and broadband Internet service providers to find new ways of generating revenue streams, increasing their ARPU (average revenue per user) and retaining existing customers.

Section three describes the issues that need to be addressed when a telecom or broadband ISP starts to develop a strategy and a roadmap for the deployment of an IPTV or broadband TV service accessible via TV.

The components that are required to develop an IPTV service are covered in section four. It provides an overview of the technical infrastructure requirements and the types of services that could be developed. It also touches upon regulatory issues.

Section five argues that there is a need to clearly differentiate IPTV services from what is already on offer through other forms of digital TV and suggests that this can be done by developing services that are aggregated around “trusted communities of interest”.

The final section draws some conclusions as to the key issues that need to be addressed when developing an IPTV service that will form a different type of TV experience that consumers will want to buy.

2. The new market space

2.1 Changes in the technologies

Over the last fifteen to twenty years many markets throughout the world have developed strong subscription based pay-TV services utilising satellite and cable. Initially they were analogue services, but most are now available in a digital format, including in some areas digital terrestrial services accessible through an antenna over the air. There are wide variations in the availability of such services throughout the world, although delivery via satellite is the most widespread. Digital TV services have created new opportunities for the development of limited interactive services enabling consumers to interact with various services offerings, usually utilising a dial-up connection.

However, all this is now changing as broadband internet services increasingly become available to the home. This not only means providing always-on broadband access to the Internet with a PC – but it now creates new opportunities for accessing content that can be viewed and interacted with on an existing TV in the home.

Telecom and other broadband Internet service providers are now utilising xDSL¹ and fibre-optic technology to develop IPTV services that are starting to compete directly with these cable and satellite TV services. Early offerings of broadband services tended to only offer low speeds for downloading content and were not suitable for delivering video-rich content to the TV. However since around the beginning of 2005 competition has increased rapidly particularly in Europe and service providers are rapidly upgrading to enable much higher download speeds – thus now starting to make it possible to deliver an IPTV service.

2.2 New IPTV service providers and their strategies

2.2.1 Start-up companies

Leading these developments have tended to be new entrant companies like Fastweb² in Italy, Video Networks with their HomeChoice³ service in the London area of the UK and the Now Broadband TV⁴ service provided by PCCW⁵ in Hong Kong, China. Video-on-demand services have tended to be the first type of services on offer through IPTV - but other services can also be made available.

2.2.2 Cable companies

Recently cable companies have also started to offer video-on-demand services like Telewest⁶ and NTL⁷ in the UK and many cable companies in the USA, including

¹ xDSL refers collectively to all types of digital subscriber lines, the two main categories being ADSL and SDSL. Two other types of xDSL technologies are High-data-rate DSL (HDSL) and Very high DSL (VDSL). DSL technologies use sophisticated modulation schemes to pack data onto copper wires (existing telephone lines). They are sometimes referred to as last-mile technologies because they are used only for connections from a telephone switching station to a home or office, not between switching stations. Source: Internet.com Webopedia <http://www.webopedia.com/TERM/x/xDSL.html> accessed 27 September 2005

² Fastweb company information web site <http://company.fastweb.it/index.php?>

³ HomeChoice is the brand name <http://www.homechoice.co.uk/> of a service provided by the company Video Networks <http://www.videonetworks.com/>

⁴ Now Broadband TV English web site <http://www.nowbroadbandtv.com/eng/>

⁵ PCCW corporate web site in english <http://www.pccw.com/eng/>

⁶ Telewest web site <http://www.telewest.co.uk/>

⁷ NTL web site <http://www.ntl.com/index.html>

Comcast⁸. However, cable services tend not to use internet television protocol and according to a report by IDC⁹ will eventually be at a disadvantage - unless they upgrade - when compared to telecom and broadband service providers. However, many cable companies particularly in a European context are still incurring considerable costs related to building and upgrading their infrastructure. This has often resulted in financial re-structuring that has constrained their ability to develop new services

2.2.3 Incumbent Telecom companies

Now, incumbent telecom companies like BT in the UK, Telecom Italia in Italy, France Telecom in France, SBC, Verizon and many other smaller telecom companies in the USA have all announced that they intend to develop IPTV services. Falling revenues from telephony and soon to be static revenues from Internet access, along with falling deployments costs for IPTV services are encouraging the telecom companies to move into the “TV space” – where they are seeing new opportunities for increasing ARPU and reducing churn from value added services like video-on-demand.

This entry into the world of entertainment is generally seen as a defensive action on the part of the telecom companies and part of an overall strategy to become a total communication “triple-play” company – offering telephony, broadband Internet access and video-on-demand services. They could eventually develop into a “four-play” or “quadruple-play” company by adding broadcast TV and also a “cinque-play” or “five-play” company offering mobile services. The strategy here is to acquire and retain customers offering them bundled services at a lower price than single offerings. Economy of scales can also be made by having a common billing system and a virtual and physical customer service centre. Reducing “churn”, that is customers moving from one operator to another - continues to be a major problem in this industry. Number portability, particularly within a European Union context, also now makes it easier for customers to take their own telephone number with them when they move to a new operator within the same country.

2.2.4 Broadband Internet service providers

As the Internet developed, a new group of companies – Internet service providers (ISPs) - emerged to provide dial-up Internet access for users, website hosting and email services for companies and for home users. Some of these companies emerged from telecom companies; others were start-ups that have grown with increased customer demand for Internet services – most recently from pent-up demand for broadband access. Unbundling of the local-loop¹⁰ has been one barrier to meeting this demand. In some markets this barrier has now been overcome enabling ISPs to gain a competitive advantage over their rivals through offering higher broadband speeds to the home.

However, increasingly this first-mover advantage will start to become eroded and ISPs who intend to survive, rather than be taken over by their competitors, in particular the larger telecom companies, will need to consider offering additional value added services to retain their customers. Taking advantage of the higher broadband speeds to the home – video-on-demand and other related IPTV services

⁸ Comcast web site <http://www.comcast.com/>

⁹ “Enabling IPTV : What Carriers Need to Know to Succeed” by Amy Harris & Greg Ireland, May 2005 IDC White paper http://www.emc.com/analyst/pdf/IDC_IPTV_WhitePaper_Jun_9_05.pdf accessed 26 September 2005

¹⁰ The line (usually copper wire) running from a telephone subscriber’s premises to the telephone company switch or exchange

are an obvious possibility. In the UK, Bulldog Communications,¹¹ now part of the Cable and Wireless Group, has indicated its intention to offer IPTV services¹². It already offers 8Mb/s speeds to the home to some customers. Another ISP in the UK, Eclipse Networks, has also announced that they plan to launch a triple play service including digital TV¹³. Eclipse Networks is owned by Kingston Communications – who currently run Kingston Interactive TV (KIT)¹⁴ – a pioneer IPTV service that started around 1999 – but has had difficulty developing a sustainable business model – despite being a showcase for the type of interactive services that IPTV can offer.

2.2.5 Virtual Telecom and Utility companies

Mention needs also to be made of yet another two groups of companies that are also entering this space in some competitive markets. There are the virtual network operators who may be offering mobile and/or fixed line telephony services as well as internet services. They buy bulk access at a wholesale price from a physical network operator and resell it at a retail price to end customers. Often the retail price to the customer is cheaper than the retail price that the physical network operator is offering its retail customers. OneTel¹⁵ is one such company in the UK. Their operating costs tend to be lower. They also have in place existing infrastructure arrangements, billing systems and customer service centres that could enable them to move into the “TV-based services space” – adding value to their existing offering – particularly as they are also likely to have increased their broadband Internet access speeds. As yet, OneTel has not made any such announcements, but it is partnering with Easynet to enable it to utilise Easynet’s wholesale broadband infrastructure providing OneTel with an alternative to the incumbent – BT’s infrastructure – in readiness for other more advanced services¹⁶.

Other utility companies are also likely to consider moving into the “TV-based services space”. In some markets like the Netherlands there is a long tradition of one utility company being responsible for gas, electricity and cable TV. Deregulation of gas and electricity services across Europe is increasingly seeing the blurring of the demarcation between the different utility companies. OneTel is, in fact, owned by the Centrica Group – who also owns British Gas and other related energy companies in Europe and North America. Critically, utility companies already have billing systems and customer support services that are used to support services in the home.

2.3 Differentiation of services and revenue streams

The increasing complexity of this market area makes it increasingly important for service providers to be able to differentiate between their service offerings and those of their competitors in an area where there is increasingly access to vast amounts of informational and entertainment content services. Communication service providers have traditionally received regular fixed and/or pay-as-you use revenue from telephony and Internet provision. But, as they enter the “TV space”, they are also

¹¹ Bulldog Communications web site <http://www.bulldogbroadband.com/>

¹² Reported in “Bulldog plans for broadband video-on-demand” Informativ on 15 August 2005
<http://informativ.com/articles/2005/08/15/bulldogplansfor/>

¹³ “Eclipse Internet to trial national platform for digital TV, telephony and broadband” Eclipse press release 4 August 2005
http://www.eclipse.net.uk/pdfs/news/040805_Broadband_TV_Trial.pdf accessed 27 September 2005

¹⁴ “Kingston Communications and the BBC Team Up to Trial Unique Broadband Service in Hull” Kingston Communications press release 10 October 2001
http://www.kcom.com/news/articles/news_10_10_01_1.shtml

¹⁵ OneTel website <http://www.onetel.co.uk/>

¹⁶ “Easynet partners with Onetel to bring superfast broadband to Onetel customers” – Easynet press release http://www.easynet.com/media/analysts_presskit_pressarticle.asp?uid=402
Accessed 1 August 2005

entering a new culture where revenue streams for the production of informational and entertainment TV programmes has tended to come from advertisements between the programmes. To add to the complexity, there have also been exceptions with a few public service broadcasters like the BBC able to offer advertisement free services due to their receiving income from a compulsory licence fee. However, it is noted particularly with the increased uptake of digital TV, that subscription and pay-as-you-view based services are increasingly becoming an alternative means of generating revenue.

Access to the Internet and in particular the web has also created a new culture – of expecting to have access to free content - although advertisers are now working out how to generate revenue streams. But, new IPTV service offerings are also likely to have an enormous impact on the traditional ways of advertising but it will also create new opportunities for reaching people through more personalised advertising. (See Appendix A “The Impact of Personalised On-demand TV on Advertising”)

2.4 Competing for time – the need for a new type of TV service offering

Ultimately, all these players mentioned above are competing for the attention and time of users or consumers in the home and on the move. They are also competing against other forms of entertainment, in particular other areas of interest outside the home as well as inside the home, like online games. Increasingly, the convergence of various media and communications devices are causing service providers to compete for people’s time in what has now been described as the Time Industry¹⁷ (See Fig. 2.1).

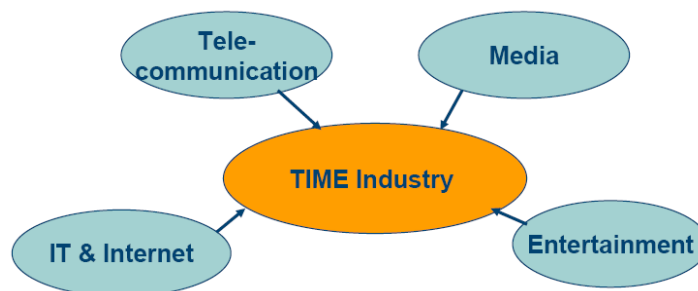


Fig. 2.1 The Time Industry

Faced by this increased demand to differentiate their service offering from those of all their competitors, IPTV service providers need to develop a service offering that creates a “personalised TV-based environment” that might eventually not only be accessed through a TV but also using a PC through the web – with elements available through mobile devices.

It is based on the notion that people will increasingly want to have access to information, entertainment and also learning opportunities – when they are interested and when it is convenient for them to access it - not when the publisher wants to make it available. The notion is around the idea that everybody “belongs” to multiple “communities of interest” – that might only last for a short while or could last a life time depending upon their life-style at different moments of their life.

¹⁷ “The future of IPTV Service delivery” Stefan Jenzowsky, Head of Business Innovation, Siemens Communication, presentation given at IPTV World Forum, 8-9 March 2005

The aggregation of appropriate content and services around these communities of interest, therefore, adds value to the service as a whole, to a point where there is increased willingness to pay for some of these services. However, critical to this aggregation is the ability to filter the content to a point that ensures that a user has timely access content relating to their “community of interest” so they do not become overwhelmed. There is also the need to enable a user to easily search for new content as they have a new “communities of interest”. This also includes content that might have been created by their friends and families. (These issues are expanded upon in Appendix B “Beyond VOD – creating new business models through communities of interest”, Appendix C “Creating a Personal World (P-World) anywhere, anytime for just in time needs” and Appendix D “Towards Personal Digital Aggregators on TV”)

The tools to enable this to happen are described in Section four and associated appendixes – but it is crucial for service providers to gain a good understanding of the types of IPTV service they wish to offer in order to give them a competitive advantage over their rivals. A way forward is described in the next section.

3. Strategies for IPTV deployment

This section describes the issues that need to be addressed when a telecom or broadband ISP starts to develop a strategy and a roadmap for the deployment of an IPTV or broadband TV service accessible via TV.

3.1 Company Strategies

When developing an IPTV service a company needs to consider it within the broader longer term strategy of the company. The main purpose of developing an IPTV service might be defensive; in order to retain existing customers - as is often the case of telecom companies. On the other hand, it might be to develop and grow the company to become a leader in this field or perhaps as part of a multi-service offering. A third strategy might be to increase its value as a first or early mover with a view to selling it off to the highest bidder in the future.

The first strategy can be illustrated by the incumbent telecom companies like BT¹⁸, Telecom Italia or France Telecom. They are seeing their ARPUs progressively reduced (See Fig 3.1) from residential customers at the same time as seeing their customer base eroded from new competitors.

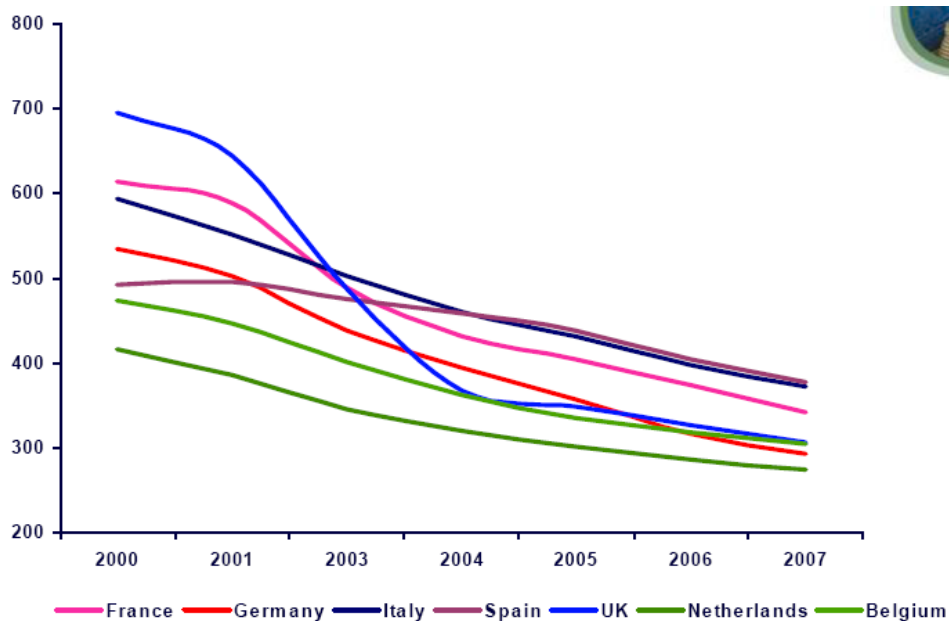


Fig. 3.1 European ARPUs (Euro) are on a downward trajectory Source: Screendigest¹⁹

Broadband ISPs like Bulldog in the UK would be considered to be an early mover developing an IPTV service as a triple play offering. As they are owned by Cable and Wireless, there might be a future strategy for its parent to move back into the retail end of the telecoms market.

Fastweb in Italy appears to be the most successful first mover now offering “four-play” services. It managed to secure enough financial investment to take it through its start-up phase and appears to have been fortunate by not encountering too many

¹⁸ “The Opportunity...fusing the elements” presentation given by Andrew Burke CEO, BT Entertainment given at IPTV World Forum, 8-9 March 2005

¹⁹ Website of Screendigest <http://www.screendigest.com>

regulatory issues that has enabled it to grow across large cities in Italy from its original Milan base. A critical factor was that its ability to develop its own fibre infrastructure to the home or to the apartment block and not to have relied upon then incumbent telecom operator’s infrastructure.

Despite starting earlier, Video Networks – who run the HomeChoice “four-play” service in the London and Stevenage areas of England, has had its growth hampered by the slow deregulation of the local-loop – forcing it to pay higher costs to the incumbent BT particularly for connection to the local loop. As soon as Ofcom, the UK regulator forced BT to reduce its local loop costs to third parties, Video Networks was able to start to grow its HomeChoice service.

It is also important to understand the strategy within the context of its local market. What might be an appropriate strategy in a complex market like many Western European countries may be very different in a less developed market like in Ukraine – where the main telecom company, Ukrtelecom, is still owned by the state, but is looking for opportunities to develop an IPTV service. In this context, it might be appropriate to grow the company quickly through developing IPTV services – so that its value would have increased by the time the government might want to privatise the company. Lack of competition and State subsidy might also enable rapid uptake of broadband services including IPTV – enabling the country to “leap-frog” in the technology race rather like South Korea. This might also help it to “jump-start” the economy of the country before it starts to become a fully-fledged market economy and subject to various regulatory and competition rules like countries within the EU.

A company’s strategy is often complex and may change over time depending on how successful it is and how successful its competitors are. However, it is important when planning an IPTV service to develop it within the broader strategy. For, if a company is planning to grow rapidly with a view of increasing its value and selling off to the highest bidder – it might be advantageous to adopt more open standards for all the components that make up an IPTV service. If costs incurred by a take-over or a merger are considered by the buyer to be relatively low – this might actually increase the value of the company to be sold.

3.2 Position within the marketplace and consumers’ behaviour

Another major consideration when deciding when to enter the market is the company’s own position within its local marketplace compared to other TV-based services – like access to satellite, cable and digital satellite services, whether these are free-to-air, pay as you use or subscription-based services and the penetration of such services. Digital TV penetration across Europe does vary widely as illustrated in Fig 3.2.

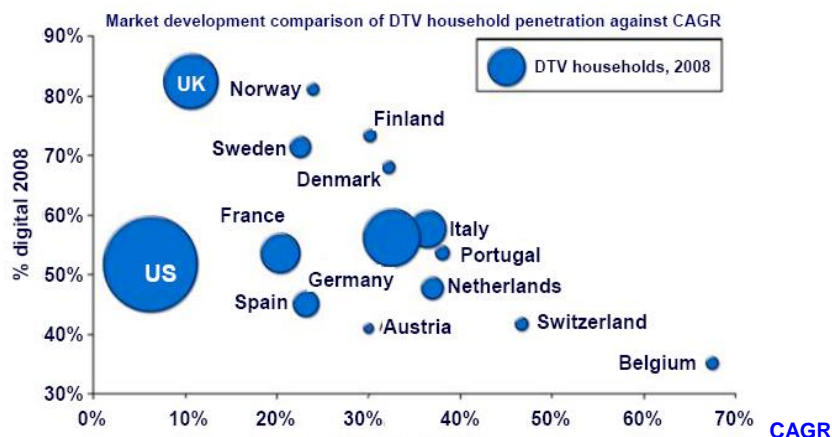


Fig 3.2 Source: Datamonitor (CAGR = Compound Annual Growth Rate)

This also relates to consumers' behaviour – like their willingness to pay for services, whether they are used to interacting with services on their TV and can easily time-shift the viewing of these programmes because they use a personal or digital video recorder or have access to multiple channels that play-out a movie starting at fifteen minute intervals – near video-on demand. Fig 3.3 illustrates some of these complexities as related to IPTV services that have been launched across the world and in particular how BT positions itself – when planning to launch an IPTV service in the UK.

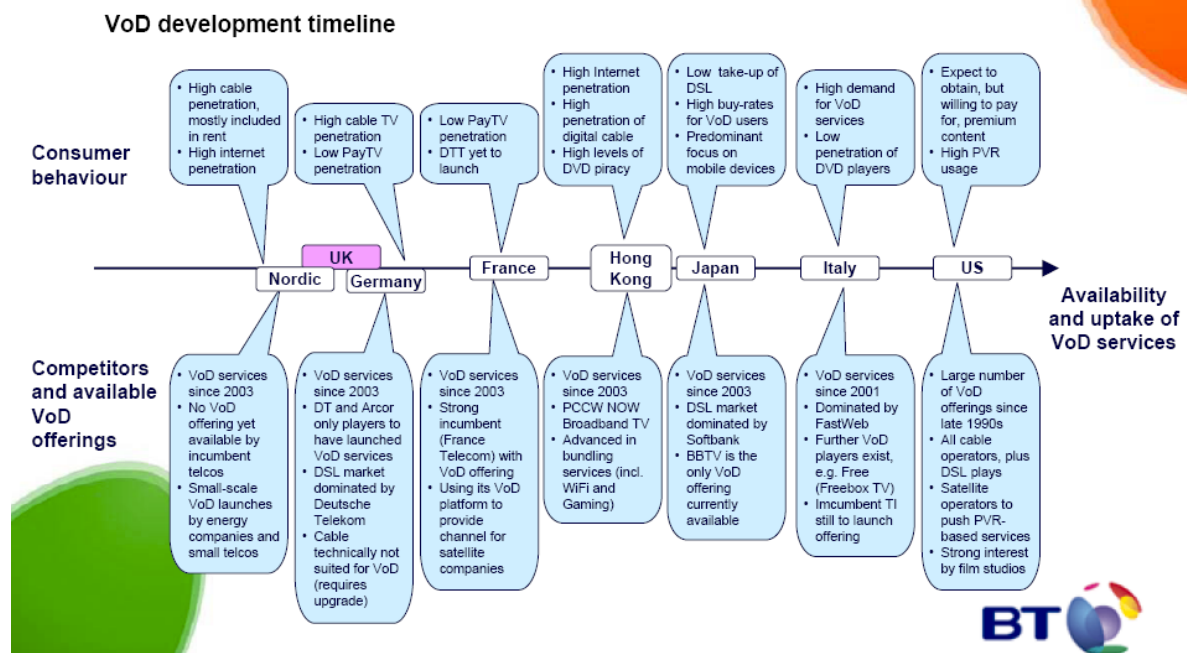


Fig 3.3 Source: press releases, company websites, analyst reports, Accenture analysis²⁰

Understanding this local market positioning is critical for any new IPTV service provider, as this will determine the type of services that it needs to offer in order to differentiate from its competitors. For example, in the UK, 63% of households²¹ already have digital TV ranging from satellite-based subscription services to digital terrestrial free-to-air channels. The two cable companies, who are soon to merge, also offer triple-play services - broadband Internet, telephony and TV channels as bundled packages at various subscription rates. They are also both rolling out video-on-demand services. As indicated above, other Broadband service providers are also planning to enter the market.

In addition, a third of UK households²² now also have broadband Internet access, which will be available to 99.6% of households by the end of 2005²³ at a minimum of 2Mb/s connections. Therefore, consumers' expectations and behaviour means they are already used to interacting with content on the TV as well as on their PC. They are familiar with the range of video-content offerings on TV and the limitations of

²⁰ "The Opportunity...fusing the elements" presentation given by Andrew Burke CEO, BT Entertainment given at IPTV World Forum, 8-9 March 2005

²¹ "Digital television UK household penetration reaches 63%" Ofcom press release, 9 September 2005 http://www.ofcom.org.uk/media/news/2005/09/nr_20050915

²² Announcement made during a presentation given by Andrew Burke CEO, BT Entertainment given at IBC, Amsterdam 9 September 2005

²³ "The Communications Market 2005 – Overview" Ofcom Report <http://www.ofcom.org.uk/research/cm/overview05/> accessed 20 September 2005

video-streaming on their PC. They might also be used to free voice-over-IP telephony and instant messaging through their Internet enabled PC, using offerings like Skype²⁴ (recently acquired by eBay²⁵) or BT Communicator.

Willingness to pay for content is another significant factor. In the UK, pay-TV spend per customer (including subscription and pay-per-view) was £369 in 2003 – 31% higher than any other country. It is also predicted to grow steadily with an 8.2% CAGR²⁶.

It is within this context of what is already available to consumers that an IPTV service needs to be developed.

3.3 Quality of Service for the total experience

As a first stage it is important for a service provider developing an IPTV service to understand that they are moving into a new industry. They are moving from being a utility company to being a company that is offering a “total experience” – in the form of communication, information, entertainment and education. Although quality of service is critical for both types of service – the total experience becomes increasingly important as the industry becomes part of and competes with other parts of the so-called “experience economy”.

An IPTV service could be considered in the context of the “experience economy” first highlighted by Pine and Gilmore:

“When a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages as in a theatrical play to engage him in a personal way.

Experiences have always been at the heart of entertainment, from plays and concerts to movies and TV shows. Over the past few decades, however, the number of entertainment options has exploded. Today, the universe has expanded to encompass a vast array of new kinds of experiences, as new technologies encourage whole new genres of experience, such as interactive games, World Wide Web sites, motion-based simulators, 3D movies and virtual reality.”²⁷

Therefore, an IPTV service offering has to compete with a wide range of other existing entertainment offerings not only in terms of time, but also in terms of the quality of the total experience. This is not just in terms of the technical quality of the service – but also in terms of ease of access and personalisation associated with areas of interest (communities of interest).

When looking at the Pine and Gilmore model (Fig 3.4), digital TV and more so IPTV can move the TV experience from passive participation where it is mainly absorbed (entertainment) and sometimes immersive because it is aesthetic to active participation where it is absorbing thus providing a learning (educational) experience. Or it might become active and immersive thus creating an escapist environment. These dimensions need to be taken into account when catering for a consumer’s

²⁴ Skype website <http://www.skype.com>

²⁵ “eBay to Acquire Skype” Skype press release 12 September 2005
http://www.skype.com/company/news/2005/skype_ebay.html

²⁶ Source: Datamonitor

²⁷ “In Search of the Experience Economy” – article B Joseph Pine II & James H Gilmore
<http://www.managingchange.com/guestcon/experien.htm> accessed 21 September 2005

passions, interests and emotions – as part of a total experience that they might be willing to pay more to have.

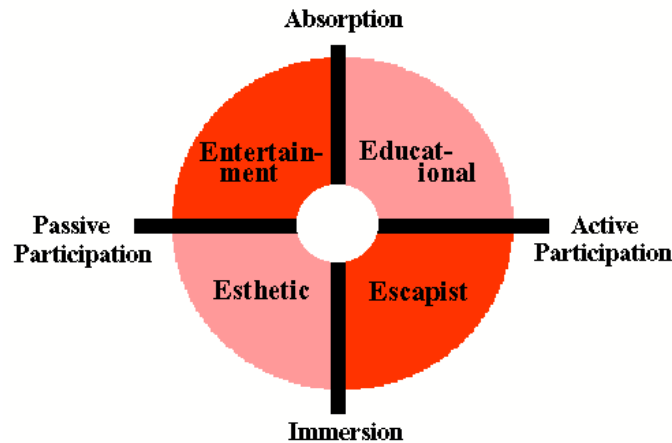
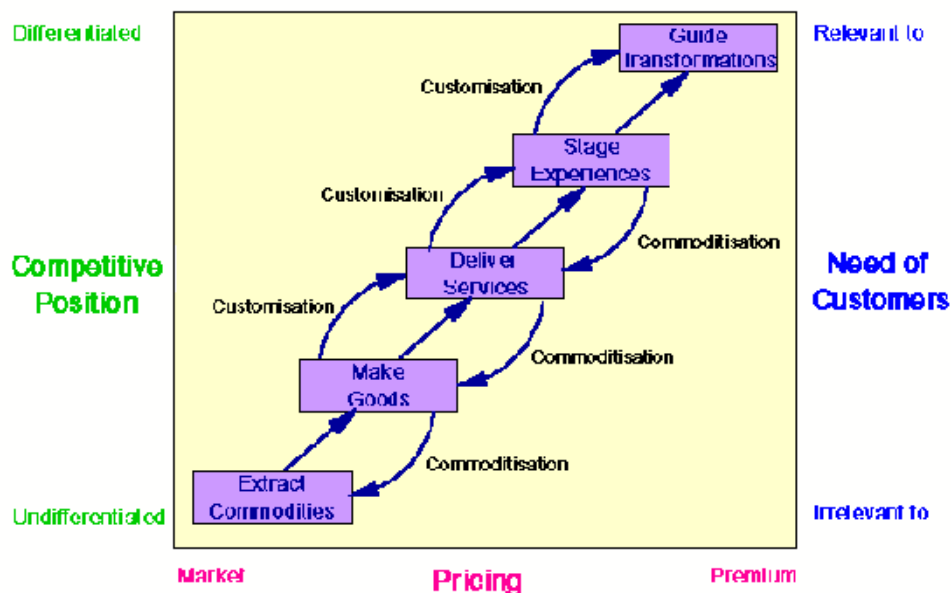


Fig 3.4 Source: Pine and Gilmore²⁸ (note esthetic = aesthetic)

Pine and Gilmore argue that once the experience economy has run its course, the transformation economy will take over. (See Fig 3.5). The basis of success will be in understanding the aspirations of individual consumers and guiding them to fully realising those aspirations²⁹.



The Progression of Economic Value, © E.J. Pine II, J.H. Gilmore, Harvard Business Press

Fig 3.5 Source: Pine and Gilmore³⁰

It could be argued that TV has for a long time been part of the experience economy – although often operating in a passive mode that has tended to “dumb down” or anesthetise the experience. Therefore, in order to differentiate from existing

²⁸ “The Experience Economy - Work Is Theatre & Every Business a Stage”

B Joseph Pine II & James H Gilmore, Harvard Business School Press, April 1999

²⁹ “In Search of the Experience Economy” – article B Joseph Pine II & James H Gilmore <http://www.managingchange.com/guestcon/experien.htm> accessed 21 September 2005

³⁰ “In Search of the Experience Economy” – article B Joseph Pine II & James H Gilmore <http://www.managingchange.com/guestcon/experien.htm> accessed 21 September 2005

experiences a consumer needs to have a transformational experience that focuses on them as an individual and provides a personalised offering that is different and more compelling than what is already on offer. But, for most telecom and broadband ISPs, this requires them to move up at least two stages of the economic value chain. This involves moving from offering a utility service that is more like a commodity - difficult to differentiate from other competitors - through offering an experience - similar to other TV offerings - then higher up the value chain to a more personalised transformational service - relevant to the needs of consumers but also capable of being offered as a higher value premium service as illustrated in Fig 3.5.

This will also require companies offering new TV-based services to adopt a customer experience management³¹ style that focuses on putting the experience of their customers at the heart of their strategies for the implementation of such services. This involves continuous analyses of customers' needs in order to develop creative solutions that are tailored towards personalising the experience. The better the total experience, the more a person is likely to pay a premium rate and stay with the company.

This involves "empowering" customers to customise the service for their needs through "self-service", but also involves flexibility on the part of the company to rapidly adapt to demands for new content and services. The philosophy is "we will try to cater to what the customer wants and will continuously adapt to their needs" rather than "you take what we offer and stop complaining if you don't like it". The key is for the customer service centre to turn "non-productive interactions" - complaints and comments about the service into "productive interactions" - that help the company turn these comments about needs into services for the customer. Thus, if a customer says "wouldn't it be nice if we could have....." - a system is in place to log that comment and to aggregate such comments for analysis, thus providing ongoing clear evidence as to the needs of their customers.

All these issues need to be addressed before a decision has been made as to what technical infrastructure has to be developed.

³¹ Wikipedia defines Customer experience management (CEM) as "the process of strategically managing a customer's entire experience with a product or a company" http://en.wikipedia.org/wiki/Customer_experience_management Accessed 21 September 2005. This is based on Schmitt, B. (2003) *Customer Experience Management*, The Free Press, New York, 2001

4. Components for deploying an IPTV service

Planning the components that are needed for the IPTV services comes after considering the company's strategy and the type of experience in broad terms that the company wishes to offer its customers in order to gain a competitive advantage over its rivals.

Components consist of the:

- technical infrastructure for running the service
- types of content and other interactive applications that consumers will access for the experience.

Flexibility is critical for both of these types of components. The service needs to be build with enough flexibility to add new features and services at a later stage should there be a demand from customers and new opportunities for increasing revenue streams. Where possible, it is advisable to build it around open standards and avoid proprietary hardware and software components that lock-in the service provider to a limited range of manufacturers – thus reducing the capacity for equipment price reductions and the adding-on of third party components.

Flexibility extends to the different types of video format encoding and encryption methods – thus enabling a wide range of video-rich content to be available. It also extends to the method that people use to navigate and find the content they want to use. Flexibility is also needed in terms of billing and payment systems. Appendix E “Creating a roadmap for the development of sustainable IPTV-based services” expands on the key issues that need to be addressed.

4.1 Technical infrastructure

Appendix F “Technical components for an IPTV service” describes in more detail the technical components for an IPTV service and some key considerations. But, there are two key decisions that need to be made when developing the technical infrastructure:

- Firstly, a decision needs to be made as to whether the user will be able to store content locally in their house or whether it will only be stored remotely.
- Secondly, a decision needs to be made as to whether the IPTV infrastructure will deliver broadcast TV.

Both of these decisions are primarily dependent upon current and future availability of bandwidth. This in turn is related to the competitive and regulatory environment in which the company is planning a service and the investment required to upgrade the infrastructure. (See Appendix G “Regulatory issues” for more details).

Where large numbers of broadcast TV channels are already available via satellite, cable and terrestrial services – it may not be sensible to offer these through IPTV – particularly if the service is only available through limited bandwidth. However, it might be appropriate to integrate a digital TV tuner into the set-top box and also include storage in the form of a personal digital recorder (PVR). The PVR can also be used to store niche content that has been downloaded via the broadband connection. Ease of use – becomes a good selling point as broadband and broadcast content is accessed through a common interface on the TV. However, the competitive advantage will still need to be through the types of niche content and the availability

of other interactive services. Cost comparisons need to be made for subsidising a set-top box compared to building a higher bandwidth infrastructure. (For an explanation of a set-top box see Appendix I - What is an IP Set-Top Box?)

It might be more appropriate to only offer a more limited IPTV service involving content being “trickle fed” into a Set-top box/PVR as in the case of Akimbo³² or just deliver video-on-demand to a specialist audience like KylinTV³³ (Fig 4.1) in the USA.



Fig 4.1 Kylin TV – access to 15,000 hours of Chinese programmes Source: ³⁴

4.2 Content and other interactive application services

The services that can be made available to the end user can be divided into:

- Video rich or audio content
- Messaging applications
- Presence applications
- Games applications
- Transactional services
- Personalised advertising
- WWW access

Users may buy into all the services or part of the services depending upon what the service provider offers. (This is described in more detail in Appendix H “IPTV content and other interactive application services”).

³² Website of Akimbo <http://www.akimbo.com>

³³ Website of Kylin <http://kylintv.com>

³⁴ From website of Kylin TV <http://kylintv.com/WhatsKylinTV/HowItWorks.asp>

5 Creating a total experience through “trusted communities of interest”

An underlying concept throughout this paper has been to aggregate content and applications around “trusted communities of interest” – in order to clearly differentiate an IPTV offering from other types of digital TV experience.

Current providers of video-on-demand services are still in the era of “forced bundling” – where they bundle together content that they think the consumer will want to buy. This may have been appropriate in the early days of subscription or pay TV offered by the satellite and cable companies, but the market is moving towards a consumer demand-led world.

The web now offers an endless supply of content – driven further by search facilities - but finding appropriate content is still very time-consuming. The opportunity is now emerging for something in between – some sort of trusted environment that will save people time yet empower them to choose what type of content they really want to have and when they want it and only pay for what is wanted - if it is not free.

A business model needs to be created that can cater for flexible consumer demands and also make money for the content producer, the distributor and others in the supply chain. Alcatel have been promoting the user-centric approach based (Fig 5.1) on content, communications and communities. An extension of this concept is “trusted communities of interest”

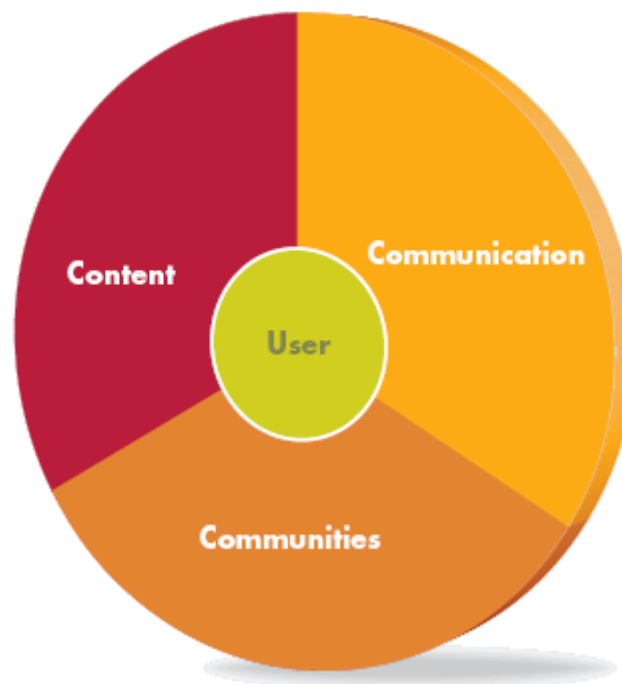


Fig 5.1 Components of the triple-play experience: content, communication and communities³⁵

Critical to understanding this business model is the concept of the long tail³⁶ (Fig 5.2) – where the distribution costs of niche content via the Internet or via an IPTV

³⁵ “Communication meets Entertainment: Community Television” by J. Bouwen, K. Vanderlinden, T. Staneker Technology White Paper Alcatel Telecommunications Review - 1st Quarter 2005
http://www.alcatel.com/doctypes/articlepaperlibrary/pdf/ATR2005Q1/T0503-Community_TV-EN.pdf
Accessed 12 October 2005

infrastructure can be the same as popular content and significantly generate new revenue streams that were previously not possible by more traditional methods. Revenue opportunities are further increased when this is linked into recommendation systems like that used by Amazon.

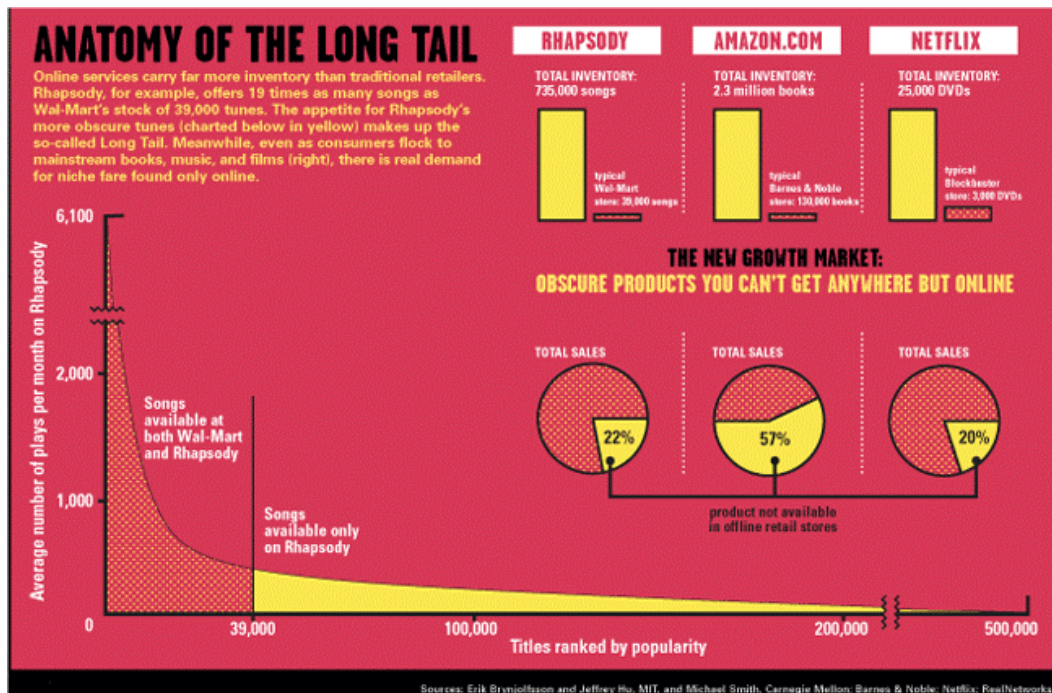


Fig. 5.2 Anatomy of the Long Tail Source: Anderson

“Trusted communities of interest” takes that concept further by enabling the “community” of users to pass on knowledge and recommendations to others about content through additional communications systems as well as enabling users to generate their own content for their community. So it not only provides a vehicle for blogging³⁷ but might also provide the means of removing inappropriate content through a wiki³⁸ type approach. Thus, the TV viewer moves from being a commentator - to a participant - to a director - and then a creator of their own content, as illustrated in Fig 5.3.

³⁶ Anderson, Chris, “The Long Tail” Wired Magazine Issue 12.10 - October 2004 accessed 18 January 2005 http://www.wired.com/wired/archive/12.10/tail_pr.html

³⁷ A blog or weblog (derived from web + log) is a web-based publication consisting primarily of periodic articles (normally, but not always, in reverse chronological order). Although most early blogs were manually updated, tools to automate the maintenance of such sites made them accessible to a much larger population, and the use of some sort of [browser](#)-based software is now a typical aspect of “blogging”. Blogs range in scope from individual diaries to arms of [political campaigns](#), [media](#) programs, and [corporations](#). They range in scale from the writings of one occasional author (known as a blogger), to the collaboration of a large [community](#) of writers. Many weblogs enable visitors to leave public comments, which can lead to a community of readers centered around the blog; others are non-interactive. The totality of weblogs or blog-related websites is often called the [blogosphere](#). When a large amount of activity, information and opinion erupts around a particular subject or controversy in the blogosphere, it is sometimes called a blogstorm or blog swarm.

Source: <http://en.wikipedia.org/wiki/Blogging> Accessed 12 October 2005

³⁸ A wiki is usually a web application, that allows users to add content, as on an Internet forum, but also allows others, often completely unrestricted, to edit the content. Based on the definition found at <http://en.wikipedia.org/wiki/WIKI> Accessed 12 October 2005

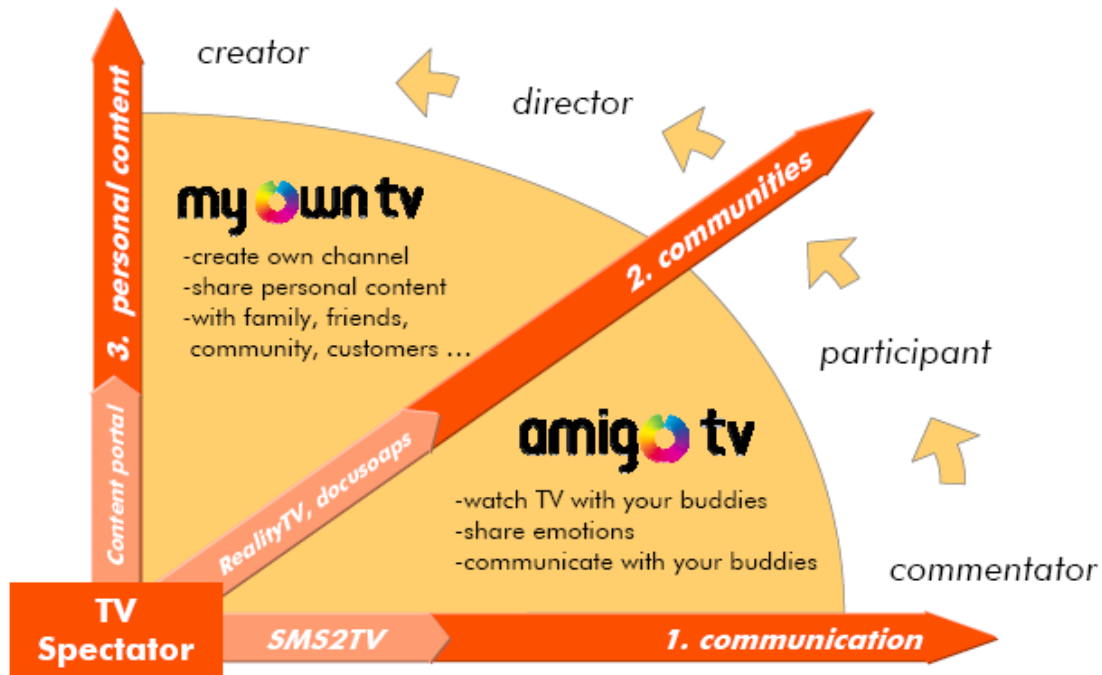


Fig 5.3 Adding three new dimensions to the TV experience³⁹

IPTV is best suited for developing this personalised TV environment compared to other types of broadcast digital TV. (See Fig 5.4)

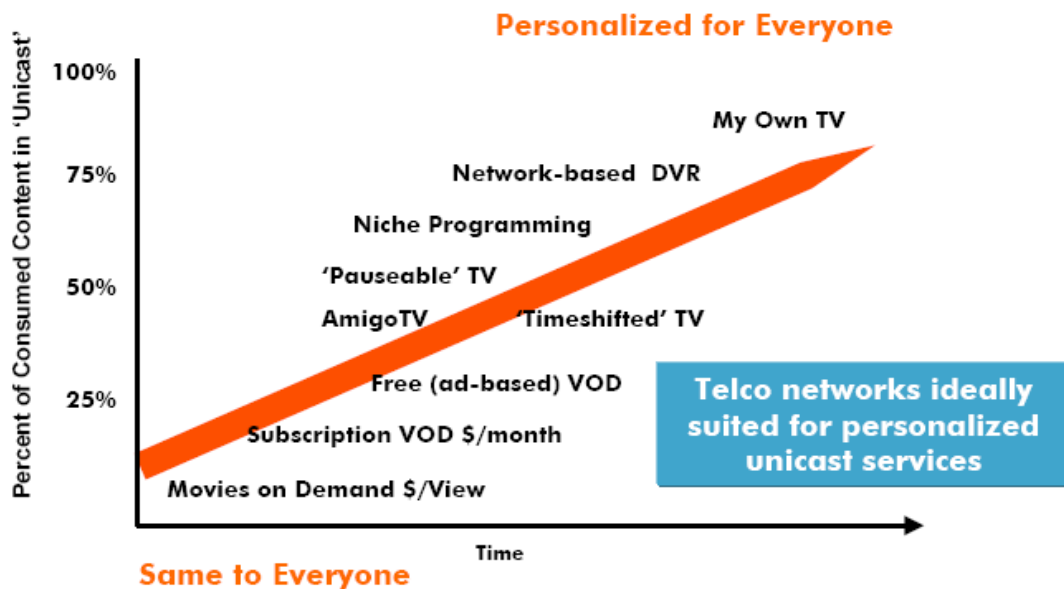


Fig 5.4 Towards a Personalised TV experience⁴⁰

It has been suggested⁴¹ that the average household is a member of 13 non-commercial communities or affinity groups (See Fig 5.5), but 90% of digital

³⁹ "The User Centric Home: Personalizing your TV experience" presentation given by R. Missault VP Marketing and Communications Fixed Solutions, Alcatel 22 September 2005, London. <http://www.alcatel.com/lead/img/tripleplay22092005.pdf> Accessed 12 October 2005

⁴⁰ "The User Centric Home: Personalizing your TV experience" op. cit.

multimedia content is not shared. As well as generating some revenue from video on demand services, IPTV also provides additional opportunities for sharing multimedia content amongst both commercial and non-commercial communities and collecting revenue from this delivery.

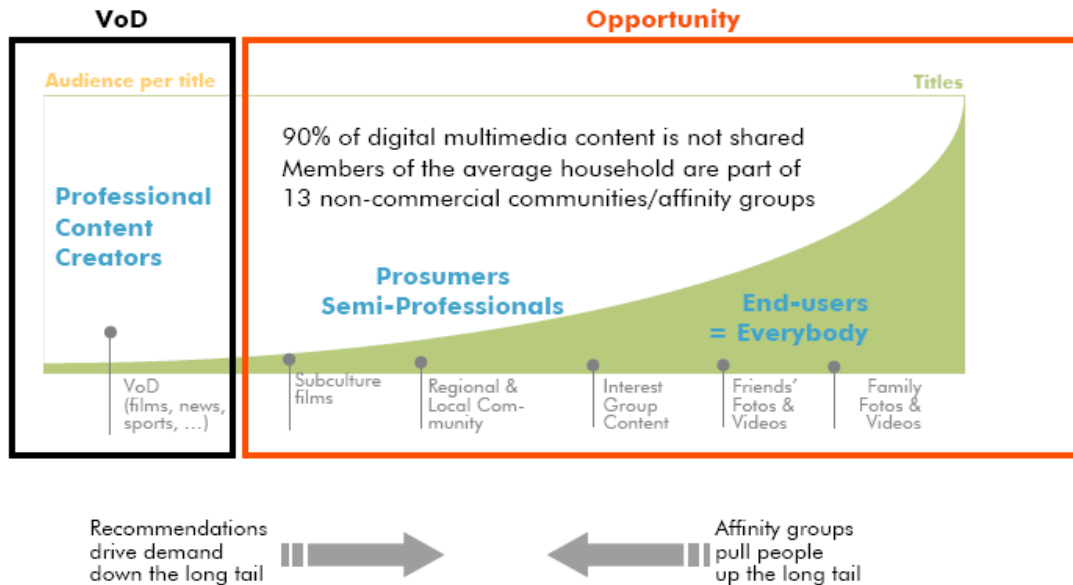


Fig 5.5 A new revenue generation opportunity through Communities of Interest

But, this will create a new threat for traditional broadcasters and particularly advertisers who are the main source of funding for channels. Broadcasters will have to adapt and will eventually move towards being content aggregators supplying content to communities through on-demand services. Some channels with strong brands will still survive and will be the means of informing and guiding people to new communities. Increasingly advertisers will turn towards utilising the personalised advertising services that IPTV can offer. (See Appendix A “The Impact of Personalised On-demand TV on Advertising” for more discussion on this issue) New relationships will need to be developed with existing communities – who already offer visually rich experiences. (For an example see Appendix J – “Bringing the National Trust into the Home – a proposal”)

However, IPTV service providers will also need to develop the sophisticated back-office integration⁴² that enables them to seamlessly deliver content and enable communications across multiple devices - TV, PC and mobile - so that they can provide a total experience in order to compete within the experience economy, but go further by creating a transformational experience. This would enable a totally enhancing experience focused around an individual’s own communities of interest.

⁴¹ “The User Centric Home: Personalizing your TV experience” op. cit.

⁴² “Enabling IPTV : What Carriers Need to Know to Succeed” by Amy Harris & Greg Ireland, May 2005 IDC White paper http://www.emc.com/analyst/pdf/IDC_IPTV_WhitePaper_Jun_9_05.pdf accessed 26 September 2005

6. Conclusions – Key features of the roadmap

When developing a roadmap for providing an IPTV service a company needs to consider the following points:

- Understand its strategic reasons why it wishes to develop an IPTV service in the context of the future development of the company.
- Understand its competitive position within the market place it intends to enter in terms of other potential service providers and existing digital TV provision.
- Clearly identify the types of IPTV service that will differentiate it from its competitors.
- Plan the technical infrastructure so that it is flexible enough to enable new applications to be easily plugged in.
- Develop the system that enables customers to have control over what they wish to access, easily and efficiently, and of a quality that is acceptable to them.
- Enable customers to aggregate content around their communities of interest and provide them with the tools to easily do so.
- Don't just focus of popular "blockbuster" type content. Provide access to thousands or millions of items of specialist or niche content that is not easily accessible from other digital TV services.
- Enable customers to publish their own content to specific interest groups.
- Enable customers to communicate with their communities about the content.
- Focus on developing a total experience that will eventually be transformational in the way an individual interacts with different communities through accessing content and communicating with others in a community.
- Develop relationships with specific communities of interest and market services around them.
- Continuously listen to customers' needs and wants and develop a culture of being able to rapidly add new applications that are demanded as they will develop new business opportunities.
- Be aware of local regulatory issues when developing the service, and in cooperation with competitors encourage self-regulation.
- Create new ways for advertisers to reach their target audiences through personalised advertising techniques.
- Be aware of data protection laws when developing personalised advertising systems.

Overall IPTV service providers will need to achieve a balance between creating a service that enables users to control and have access to large amounts of content that they want, but is not so overwhelming that it takes a lot of time to search or wade through the content. A personalised TV environment thus needs to be created enabling users to access and contribute to their own multiple “trusted communities of interest”.

Number of words = 6198

Appendix A - The Impact of Personalised On-demand TV on Advertising

- a thinkpiece from pjb Associates

Unless you are a major public service broadcaster like the BBC with a guaranteed income from compulsory TV licence fees from UK residents, most TV broadcasters have to rely upon advertising as a means for generating income that pays for the programmes that are broadcast. However, this landscape is changing.

Personal video recorders (PVRs) or digital video recorders like Tivo are enabling people to skip over the 30 second ad slot. According to Accenture 40% of US households will have a PVR/DVR device by 2009 and 22% will be ad-skipping. TV advertising in some households is now spread over 500 TV channels which make it increasingly difficult for advertisers to know where to place their adverts in order to get the biggest impact. A new business model is also emerging through paid for, but advert-free, video-on-demand services.

Personal Profiles

But, this is just the beginning, a wide variety of other personalised services will also start to compete for attention on the TV and for people's time. This will range from compelling, very immersive video games to home produced user generated video content that can be accessed by anyone through a search engine or pushed out on a regular basis through various feed services that the user has opted into or through various recommendation services that learn the user's interests. Each member of the household will be able to set-up their own profile and it should also be possible for parents to restrict the type of content that their children watch. Of course, this could also include advertisements.

New opportunities?

All this starts to become possible as broadband TV emerges through cable or through IPTV creating a new personalised TV environment allowing viewers to access to a wide variety of video-rich content. So what new opportunities are possible for advertising?

It's all going to become more personalised, enabling customised one-to-one marketing and the accurate collection of customer information and preferences. This is all good news for advertising agencies – but what about personal privacy – will there be a backlash from civil liberty lobbyists?

Companies are still trying to work out the business model for advertising around video-on-demand. Will it be 2.5 euro with advertisements or 5.5 euro without? Or will it be advertising-on-demand? There is some evidence from broadcast interactive TV that people do like to go specifically to watch a compelling advert – particularly if it is funny or there is has an on-going story.

With complicated products like cars and healthcare goods so-called “showcase advertisements” may be useful to drive people to the advert so they spend more time looking at them and interacting with them. TiVo appears to have been successful pushing these showcase adverts to its PVR where it could sit passively in an especially reserved storage area until it is accessed from its associated programme. The showcase advert could also be held remotely by a broadband service provider. For industries, like financial services, “leads” are particularly important so the ability to “click-through” and then “volunteer” your interest adds value to the advert.

Another potential business model is to use these on-demand services as a way of conducting remote market research to test interest in new products or their associated adverts. It could be a very cost effective and rapid way of gaining feedback from potential customers.

Personalised ads?

Personalised ads are already a common feature of many web sites – served up by recommendation tools in the form of ads from Amazon or Google. There are now companies working on similar addressable advertising solutions for broadband TV. Adverts can be related to the types of content that the user accesses on demand. Or the user might choose by themselves the type of adverts they wish to watch. But, adverts of this type will become increasingly informational. Linear travel or shopping channels will benefit by becoming on-demand, but with the ability to search for content appropriate to a user's interest.

As users increasingly have control over what type of adverts they want to see, word of mouth aided by the technology for easy distribution will become increasingly important. This might actually involve passing an advert around via video email or through the use of buddy networks or blogging. New business models still need to be fully worked out as to who gets compensated for what.

Ethical advertising

Peer-to-peer sharing of video-files and viewing them on a TV will increasingly become popular. So another way for advertisers is to tap into this culture through "video wikis". Wikis are editable web pages and has resulted in Wikipedia, the online encyclopedia that anyone can edit. If people disagree with definitions or content they can edit it themselves. This can happen again and again. Eventually peer pressure and consensus building results in a definitive version of a definition or what should be the message. This is an interesting opportunity for creating ethical advertising. This could be dangerous for advertising agencies that might loose control of the message, but it would also provide new creative opportunities.

When's the tipping point?

Advertisers will want to move to various forms personalised advertising only when they see clearly erosion from the linear TV business. But agencies need to be prepared for such changes that could start to happen rapidly as increasingly households become broadband enabled and cable and telecom companies push out broadband TV services. But, the key issue for advertisers will be they will have to increasingly compete for people's time and attention on TV which is no longer a passive viewing environment.

This paper - a thinkpiece - has been produced by Peter J. Bates, Senior Partner of pjb Associates. The aim of this thinkpiece is to stimulate discussion and thinking around these emerging issues. If you think that pjb Associates can further help your company or organisation better understand these issues please contact us.

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Appendix B - Beyond VOD – creating new business models through communities of interest

- a thinkpiece from pjb Associates

This year (2005) broadband TV or IPTV has finally started to take off. However, most business models are tending to focus around the delivery of video on demand (VOD) services based on movies. But, there is growing concern that just VOD offerings are unlikely to provide the returns on investment or create sustainable models, particularly as the studios are demanding a high percentage of revenue-per-view. As there is also a limited production of so-called “blockbuster” movies per year, the costs of acquiring distribution rights is unlikely to go down as they will go to the highest bidder – the dominant pay-TV satellite or cable company.

Also, do consumers really want the same offerings that they might already be getting from satellite or cable?

New TVoDSL service providers will really need to differentiate their offerings from their competitors. For video-on-demand they will need to look towards niche markets where people cannot easily access content on a TV. For example: -

I'm going to Bologna and I remember that James Burke featured the city in one of his “Connections” programmes a few years back on the BBC. I would love to see that programme again and I'm willing to pay a small fee to watch it!

Of course, this will require sophisticated video searching engines to find my needs. But, they are already emerging with Google, Yahoo and Altavista – at least on the web.

But what's the business model? There is evidence emerging from Rhapsody-on-line and Amazon that the “Long Tail” economy – created by the less popular titles can generate significant revenues. But, this leads onto recommendations made by other people and thus the creation of communities of interest. Every person probably belongs to at least ten communities of interest related to their lifestyle. Understanding these communities of interest and “feeding” these interests creates new opportunities for value added services ranging from the latest video news of your favourite holiday location; advice on improving your basketball techniques to personalised advertising focused on baby products – because the system knows you are going to have a baby.

Focusing on communities also creates marketing opportunities to “block sell” the broadband TV offering to the whole of that community rather than sell a generic service. There are also new opportunities around professional communities of interest - teachers, doctors, healthcare workers or accountants – who are not just buying into training and professional updating – but also a community of like-minded people where they can tap into each others knowledge and experiences.

This then leads onto additional service offerings in the form of RSS feeds, user generated content, video-podcasting, blogging, one-to-one and one to a few, TV based, video-conferencing - in order to create a rich social experience around using the TV. However, all these services will need to be easy to use as well as complement, enhance and enrich the experience that some users already experience

on their PCs. In addition, some of these services will need to be seamless and also be easily accessible, on a PC as well as a mobile device.

New broadband TV operators are going to need to move fast in order to differentiate their service offering from existing cable and satellite service providers on the one hand and what is already available through the web.

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Appendix C - Creating a Personal World (P-World) anywhere, anytime for just in time needs

- a thinkpiece from pjb Associates

Time is becoming increasingly important for many people in a world that increasingly gives them access to vast amounts of information and entertainment via the Internet, radio, cable and satellite TV and through their mobile devices. Various software aggregation tools and search engines are now widely available through the web to assist people find what is of interest to them – but currently they are hardly saving people time. In many instances it can take more time to decide what is wanted compared to when there were more limited choices.

With the development of interactive TV the television is now no longer used passively. Over the next five years personalised TV will emerge as the dominate mode of operation driven by IPTV developments that will enable video-rich content to be accessed from the Internet onto the TV.

The mobile phone is already a personal device that is taken almost everywhere by an individual. It is not only used for telephone calls and SMS messaging but increasingly for accessing music, video streams, the web and within the next eighteen months live broadcast TV.

People operate within multiple and sometimes overlapping “communities of interest” that change over time throughout their lives. Some “communities of interest” may only last a few hours, others a few weeks and some a lifetime. They can be related to work, studies leisure, interests and family life. Each of these “communities of interest” needs to be feed with a wide variety of sources of information and knowledge that is often media-rich. They often involve a wide variety of different relationships with other people. This rich environment that many people are exposed to also creates increasing pressures on people’s time. Ways need to be found to reduce the number of “non-productive interactions” and increase the number of “productive interactions”.

Increasing the number of “productive interactions” is also vital for companies selling products and services and for advertisers promoting them. Personalised advertising is something that advertising agencies have yet to fully address.

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Appendix D - Towards Personal Digital Aggregators on TV

- a thinkpiece from pjb Associates

People started to be able to personalise their viewing habits on the TV when digital video recorders (DVRs) or personal video recorders (PVRs) started to become available around six years ago. TiVo took the lead in the USA and the UK with a device that not only recorded TV programmes onto a hard disc but could “learn” a viewer’s preferences and automatically record programmes that it thought were going to be of interest. It is also possible to add keywords like the names of a film star or a country you plan to visit and the device will have a go at finding what you want and recording programmes that it thinks may be of interest for you. Other satellite TV providers like Sky in the UK and Italy and a few cable TV providers are also now providing similar devices.

However, this is only the start of personalisation. The very rapid roll out of high speed broadband to homes across the world is creating new possibilities for the development of IPTV or Broadband TV that could enable the TV to become a truly personalised device – enabling the viewer to watch and interact with a wide variety of video-rich content services that are customised for each user’s needs.

Currently, TV viewers can only access content that is offered to them by the cable or satellite operator. However, broadband TV could change this. Using some sort of search engine it will be possible to find video-rich content from thousands or millions of special interest niche programmes from all over the world and in different languages. This would not only be professionally produced content, but it could be produced by amateurs – so-called user generated content. It will also be possible to store home-produced videos and other pictures remotely and show them to your friends on their TV in their own homes. The TV will be used to video-conference to friends and relations – perhaps across the world and also show them the holiday video you have taken. Solutions already exist to find out which of your friends are also watching the same TV programme and then voice chat to them over the TV.

The TV could also be used as a personal organiser enabling you to view your calendar for the day plus details of any travel problems that you might encounter as well as video news headlines covering any topic of interest. Targeting advertising is also possible and eBay is already accessible on TV for the user to place bids on items on their wishlist and get notified on the TV if they have been outbid.

How you use the TV will depend on your personal lifestyle. For some people it may be the only digital communication device that they may have – but these developments will create a richer information, entertainment and learning environment including accessing public sector information. For many using the TV will be seamlessly integrated with using their computer and mobile phone. However, to make this happen will require “personal digital aggregation” software tools that will create the interface for users to personalise their requirements. These will need to be different for each device - the TV, computer and the mobile phone, but integrated together at a remote server so that preferences can always remain updated – whatever device is used – whether it is in the home, on the move, at work or in a TV in a hotel room.

The software tools to make this possible are already emerging for use on the web. Marc Canter co-founder of Macromedia and now CEO of Broadband Mechanics

conceived the concept of "digital lifestyle aggregators" about two years. He considers that digital lifestyle aggregators (DLAs) combine five basic elements - social networking, personal publishing, media and device management, personal communications and mobility. This would allow for the easy recording, management and access to personal image libraries, music, clips, preferred news and other information feeds and many more ways of accessing, manipulating and distributing content. Microsoft's Media Center is already offering this facility to a certain extent on the TV and web-based aggregation tools are also starting to emerge from small and big players like Google and Yahoo. Low cost or even free video streaming hosting services are also emerging on the web for both commercial as well as for personal use.

Another perspective is the development of personal media aggregators (PMAs) that are focused around a product, a service, a company or a celebrity. A personal media aggregator brings together the different communication and interaction modes allowing instant vertical communities to be rapidly created around them rather like the swarming of bees around the queen – once the workers have chosen who should be the queen. This would involve the utilization of tools to enhance the opportunities for the community to bond together - like bulletin boards, profile creation and sharing for members, one-to-one text, audio and video chat an extension of text-based chat-rooms or blogging plus the sharing of user generated video-content.

All this presents interesting opportunities for value-added services that telcos could offer through IPTV but it also creates new opportunities for new players who could source an IPTV set-top box and set-up and market their own service independent of the telecom operators – perhaps around a specific interest group of community of interest. People already have the TV and certainly in many parts of the world like Europe it is easy to get a broadband connection independent of content services.

So the opportunities exist for telcos, but also for other new smaller independent and possibly more agile players.

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Appendix E - Creating a roadmap for the development of sustainable IPTV-based services

- a thinkpiece from pjb Associates

OK, you know your company has to move towards developing IPTV-based services but which way do you go in order to achieve this?

The “land-grab” rush has already started telcos, ISPs and a few new players are already in the race. Technical infrastructure upgrades and the end of financial restructuring mean that the cable companies are either ahead of the race in some regions of the world or are just off the starting line in other regions. The satellite pay-TV service providers are starting to see their often first move competitive advantage become eroded and are starting to think about how to use broadband.

The Hollywood studios are in deep negotiations with all these players, but happily holding the cards and determining their cut of the revenue streams – high enough to ensure that it does not under-cut their DVD market and lower enough to ensure that the video-on-demand service providers will hardly make any revenue from this stream. It may reduce broadband churn and maintain ARPU but not create new value-added revenue streams.

So which direction do you go to create these new value added services? Here are six things to consider: -

Understand your customers - Think about your existing and your potential customers? What are their lifestyles? What communities are they part of? Everyone has multiple communities of interest that may last a few hours at a concert, many years for a particular passion and a lifetime with friends and relations. Tap into these communities of interest, design and market your offerings around them.

Capture your customers' needs and wants – With existing and future users do you have customer management systems in place to capture their needs and desires and aggregate these wants so that you can rapidly identify market opportunities for offering value added services? Do your customer call centres have the tools and skills to turn complaints and comments from non-productive interactions into productive ones that not only help to collect knowledge of needs and wants, but enable them to sell value added services? Do your customers have access to self-service help systems that are easy to use but not frustrating to use?

Empower your customers – The interactively offered through broadcast TV and the wide open web-based environment of the Internet has enabled customers to have control over a vast amount of content so what is different about your offerings? Create an environment that enables them to easily personalise and customise your offerings to their needs and enable them to produce and publish their own content. There should be flexibility to enable people to start with a simple user environment yet add components so that it can be customised for their needs.

Increase quality time - You will be competing for people's time which is increasingly becoming very important for many people. Create an

environment that enables them to have what they want around their areas or communities of interest thus enabling them to use their time more efficiently.

Pick and mix – have the ability to easily pick and mix video-rich content around communities of interest and also additional applications as consumers demand additional services beyond just video-on demand. Is your sales team totally integrated within your customer management and technical teams to enable needs to be rapidly identified and implemented?

Plug and Play – enable current and future application software, middleware and hardware to be easily plug and play so that you can adapt it quickly and easily to your system so you can cater for increased or changing demands from your users. Do you have a culture of “yes, we can” amongst your technical staff? Can you second source components and thus keep costs down? Do you have quality of experience measurement systems in place linked to service level agreements?

Overall, what you are going to need to do is to differentiate your services and content offerings from all the other players entering the game. This will require you to be agile and flexible in order to quickly adapt to your customers needs. This is going to need a change of thinking from the more traditional top-down approach. However, all this will create complexities from concept through design onto implementation and full skill-deployment. Is your roadmap flexible enough for rapid changes in market developments?

We can offer you a flexible and independent team of people who have a wide range of skills and expertise to that will be able to work with you to develop, implement and manage a roadmap from concept to full deployment and growth. We can help you decide what will be the appropriate service and content partners for your needs and in particular the needs of your customers.

This paper - a thinkpiece - has been produced by Peter J. Bates, Senior Partner of pjb Associates. The aim of this thinkpiece is to stimulate discussion and thinking around these emerging issues.

If you think that pjb Associates can further help your company or organisation better understand these issues please contact us.

You may freely distribute this thinkpiece so long as you acknowledge its source. It can also be found at <http://www.pjb.co.uk/thinkpiece6.htm> . Further thinkpieces will be available at: <http://www.pjb.co.uk/thinkpieces.htm>

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Appendix F - Technical components for an IPTV service

This paper looks at the technical components that are needed for an IPTV infrastructure are illustrated by Fig F1 in terms of the value chain. It highlights key issues that need to be considered when developing the roadmap for the infrastructure.

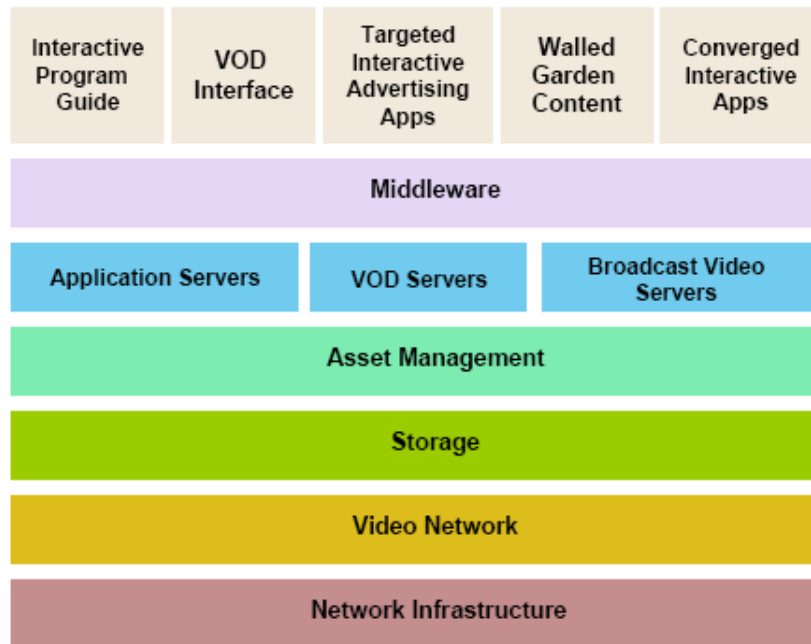


Fig F1 IPTV Infrastructure Value Chain Source: IDC⁴³

Network Infrastructure and Video Network - Telecom and broadband ISPs need to consider whether their existing infrastructure has the capacity for handling the vastly increased traffic that will result from distribution of video content without any bottlenecks – running as a purely on-demand pulled service to consumers’ homes or whether some content will need to be pushed out at off-peak times and stored locally on a personal digital recorder in peoples’ homes. The roadmap will need to highlight when infrastructure upgrades are needed and where along the network. As an interim measure it might be appropriate not to deliver live broadcasts, relying on them to be delivered over via digital terrestrial broadcasting. However, this would require a turner in the set-top box in the home.

Storage and Asset Management - Efficient storage and rapid access to content assets held in a central base is important here as this determines the quality of service and thus the overall experience for the consumer. Asset management involves ensuring that the consumer gets what they request, is billed for it and includes digital rights management that protects the content for its owner to ensure that it is not copied for illegal purposes. The content owner must also be paid for content that is used.

⁴³ “Enabling IPTV : What Carriers Need to Know to Succeed” by Amy Harris & Greg Ireland, May 2005 IDC White paper http://www.emc.com/analyst/pdf/IDC_IPTV_WhitePaper_Jun_9_05.pdf accessed 26 September 2005

Application, video-on-demand (VOD) and broadcast servers – all control supply and demand for content and applications requested by customers. They may be at the central base but multiple servers may also be more locally based depending upon how large the infrastructure might be. More servers can be added-on and the network grows but the application and video-on-demand servers must interact with the storage and asset management systems. The broadcast servers manage the receipt of the live broadcasts from satellite down links.

Middleware – is a type of application software that resides in the set-top box in the home to control the services requested and received. This is also related to encryption of the service, decoding of the content so that it can be viewed on a normal TV.

The set-top box is the only additional piece of hardware required by the end user in the home. At one end it is plugged into the broadband connection and another connection goes to the TV. It might also have local storage in the form of a personal video recorder capable of holding more than sixty hours of video-content. It might also have a TV tuner to receive digital terrestrial or satellite broadcasts – depending on what the service provider is offering.

The set-top box may contain additional ports to plug-in devices that store user produced video or digital picture content for viewing directly on their TV or for uploading onto the service provider's remote server to enable friends and family to view the content. A port might also be available to connecting to a video iPod-type device for viewing content whilst on the move.

Overall, the Set-top box needs to be capable of being plugged in by the customer and not requiring the visit of an installation engineer to house – that results in an additional cost for the service provider. Remote diagnosis for fault finding is also crucial.

Applications layer – At the top of the value chain sitting within the set-top box above the middleware layer are various applications that control the type of experience a customer receives on their TV. This involves the interactive program guide – that navigation system that the user interacts with in order to access content and applications. It would involve the control panel and a billing interface enabling customers to upgrade or downgrade services through self-serve portals see what billing changes are triggered by different viewing habits with IPTV so they can fully understand the billing implications of the changed services⁴⁴. The VOD interface determines the type of viewing experience – whether it is a picture-in-a-picture or a mosaic enabling the viewer to choose what video stream they wish to see.

Decisions have to be made as to whether certain types of content can only be viewed within a “walled garden” environment – perhaps through a premium subscription service or whether they are available as a pay-as you-use service.

Additional interactive services like a messaging centre, caller ID and presence services might also be available as an added value service opting in through self service portals.

⁴⁴ Self-Provisioning, Self-Care Could Be the IPTV Differentiator By Susana Schwartz - August, 2005, Billing World and OSS Today Magazine <http://www.billingworld.com/archive-detail.cfm?archiveId=7692> accessed 23 September 2005

There is also a need to take into account when planning the technical infrastructure that applications for targeted advertising aimed at users in specific locations or with specific interests are also starting to emerge.

Decisions also have to be made as to whether video telephony will form part of the service. This is dependent upon the type of bandwidth that is available and whether it is synchronous or not. As VDSL2⁴⁵ - the standard agreed by the ITU in May 2005⁴⁶ - starts to be deployed high quality video telephony will increasingly become possible, although poorer quality but perhaps acceptable one-way and two-way video will still be possible with ADSL2+ - with downstreams up to 24 Mb/s and upstreams of up to 3.5 Mb/s.

Technical systems integration – As there are many suppliers of these various components that make up the technical infrastructure, it is very likely to require the services of a systems integrator to ensure that all the component parts fit together – but according to the needs of the IPTV service provider and the types of services they want to offer in order to differentiate from their competitors. A turnkey solution may or may not be appropriate for such needs.

⁴⁵ VDSL2 (Very-High-Bit-Rate Digital Subscriber Line 2, ITU-T G.993.2 Standard) is an access technology that exploits the existing infrastructure of copper wires that were originally deployed for [POTS](#) services. It can be deployed from central offices, from fibre-fed cabinets located near the customer premises, or within buildings.

ITU-T G.993.2 VDSL2, is the newest and most advanced standard of xDSL broadband wireline communications. Designed to support the wide deployment of Triple Play services such as voice, video, data, high definition television (HDTV) and interactive gaming, VDSL2 enables operators and carriers to gradually, flexibly, and cost efficiently upgrade existing xDSL-infrastructure.

ITU-T G.993.2 (VDSL2) is an enhancement to G.993.1 [VDSL](#) that permits the transmission of asymmetric and symmetric (Full-Duplex) aggregate data rates up to 200 Mbit/s on twisted pairs using a bandwidth up to 30 MHz.

VDSL2 deteriorates quickly from a theoretical maximum of 250Mbps at 'source' to 100 Mbit/s at 0.5 km and 50 Mbit/s at 1 Km, but degrades at a much slower rate from there, and still outperforms VDSL. Starting from 1,6 Km its performance is equal to Adsl2+.

ADSL-like long reach (LR) performance: ADSL-like long reach performance is one of the key advantages of VDSL2. LR-VDSL2 enabled systems are capable of supporting speeds of around 1-4 Mbit/s (downstream) over distances of 4 to 5 km, gradually increasing the bit rate up to symmetric 100Mbit/s as loop-length shortens. This means that VDSL2-based systems, unlike VDSL1 systems, are not limited to short loops or MTU/MDUs only, but can also be used for medium range applications.

In [France](#), [Club Internet](#) will start commercial services in 2006, [France Telecom](#) in 2007.

In [Sweden](#), [Bredbandsbolaget](#) are conducting VDSL2 tests as of October, 2005.

Accessed from Wikipedia <http://en.wikipedia.org/wiki/VDSL2> 11 October 2005

⁴⁶ "New ITU Standard Delivers 10x ADSL Speeds - Vendors applaud landmark agreement on VDSL2"

International Telecommunication Union (ITU) press release 27 May 2005.

http://www.itu.int/newsroom/press_releases/2005/06.html accessed 11 October 2005

Appendix G - Regulatory Issues

Regulation related to the development of IPTV services is primarily dependent upon the region in which the service is to be developed and will be determined by local laws and government policy. It is a very complex area. However, it can be divided into rules governing two broad industry areas that emerged historically when each industry was clearly separate: -

- Telecommunications
- Broadcast

In addition, there are emerging issues related to accessing content from the Internet – that might also have an impact of IPTV services.

This paper is mainly illustrated by the regulatory situation in the UK – which is probably one of the most advanced and developed in the world that is being used as a model by a number of countries. Since 2003 broadcasting and telecommunications regulation is now under one regulatory body – Ofcom.

Ofcom's approach^{47 48} to regulation involves: -

- Various duties under the Communications Act 2003, summarised as:

– *“Ofcom exists to further the interests of citizen consumers through a regulatory regime which, where appropriate, encourages competition”*

- These will be performed with a light-touch approach:

– *“Ofcom will operate with a bias against intervention, but with a willingness to intervene firmly, promptly and effectively where required”*

- Striking the right balance:

– *“Balance the promotion of choice and competition with the duty to protect customers”*

Telecommunications Regulation

With the exception of the USA most countries in the world State owned the telephone network. However, over the last thirty years many countries have privatised the state owned telephone companies and encouraged new competitors to enter the market in order to stimulate innovation and investment from independent financial institutions.

However, the former publicly owned Telecom Company has tended to have a number of advantages over new entrants – in terms of being large, dominant and in particular owning the local loop – the wire from the telephone exchange to each house or apartment. In order to encourage competition, most governments have tended to set up a regulatory body that is able to deal with complaints about the unfair competition and impose rules, regulations and financial constraints on the

⁴⁷ "Regulating on-demand content over IPTV" by David Harrison, Head of Broadcast and New Media Technology, OFCOM - presentation on 8 March 2005 given to IPTV World Forum, London, UK

⁴⁸ "Ofcom guidelines maintain reduced regulatory intervention" Ofcom Press release 23 March 2005 <http://www.ofcom.org.uk/media/news/2005/03/nr20050323>

incumbent (former state-owned company) if it is using its dominance in the market place unfairly against other companies who are trying to or have entered the market.

One key area that affects the development of IPTV services – relates to the unbundling of the local loop. For example, an incumbent telecom operator may already be able to reach 99% of households through its existing telephone infrastructure. However, if it is operating in a limited competitive environment, the incentive to upgrade its network for faster broadband might be low. But, if the regulatory authority wants to create a more competitive environment enabling new players to enter it might impose various regulations on the incumbent.

Unbundling of the local-loop allows other third-party companies to put their equipment in the incumbent's local exchange and connect it to the local wires to household's and to their own backbone network enabling them to not rely on the incumbent's backbone – thus a potentially cheaper route back to the third party company's premises. The incumbent can still charge other companies for using the local loop – but the maximum price for doing this is likely to be determined by the regulator – who would want to set a price that creates a competitive environment for lowering prices for the consumer at the same time as stimulating the development of new innovative services.

It is critical for new entrant companies to try to predict the right time to enter the market so they are not handicapped by having to pay high prices for access to the local loop. For example, Video Networks who run "HomeChoice" in the London area were forced to pay the incumbent BT high prices for access to the local loop. It was only when the regulator forced BT to reduce its prices that Video Networks was able to start expanding its service from September 2004. However, it has already incurred heavy debts as a result of being an early entrant into the market.

However, early deregulation, around 2003/04, of the local-loop in some parts of France, particularly around the Paris region has resulted in a number of new entrants offering bandwidth speeds of up to 20Mb/s and has, in fact, forced the incumbent France Telecom to compete by increasing speeds.

In the UK, as of the summer of 2005, unbundling the local loop combined with the latest technology developments are now encouraging broadband internet service providers to increase their bandwidth up to 24Mb/s – with plans to offer IPTV services from 2006. Initially, these services will be limited to high density urban areas that are likely to gain the highest revenue return from the capital costs of installing equipment in exchanges owned by BT plus the cost of renting the local loop from BT. However, potentially they could offer a superior IPTV service to what BT plan to offer from around September 2006.

Local loop unbundling is a severe regulatory pressure imposed upon BT that has forced BT to reduce its "rental prices further since 1 January 2005 – with further price reductions to follow⁴⁹⁵⁰. This has created opportunities for new entrants to enter the market – for which BT are responding with their entertainment strategy. Regulation, has thus stimulated innovation and is likely to create a wider range of products and services in the near future as a result of competition.

⁴⁹ "Update on Local Loop Unbundling" Ofcom press release 8 February 2005

http://www.ofcom.org.uk/media/news/2005/02/nr_20050208_2

⁵⁰ "Ofcom publishes final Local Loop Unbundling charges" Ofcom press release 16 December 2004
http://www.ofcom.org.uk/media/news/2004/12/nr_20041216

Broadcasting Regulation

This is best illustrated by looking at the UK. It can be divided into three types of regulation: -

- Regulation related to when the incumbent telecom operator is allowed to broadcast or supply television services.
- Broadcast TV regulation – relating to all TV broadcasters
- Video-on-demand regulation

Telecom operator supplying broadcast services

Up until 2001 BT as the incumbent telecoms operator was not allowed to broadcast or supply television services. This may have delayed thinking within BT to move within this direction. However, the market conditions were not particularly well suited before 2001 as uptake of digital TV was still very low. On the other hand if BT had been allowed to broadcast earlier this may have stimulated the regulator to encourage competition and thus create conditions more favourable for new entrants like Video Networks – who were already offering video-on-demand services in the London area and Kingston Communications in the Hull area – although the later was through its own telephony network which was not owned by BT.

Still, in March 2002⁵¹ BT did receive its broadcast licence after applying for it in 2001. Whether, it plans to actually offer broadcast TV – remains rather unclear. It currently has a number of technical constraints over quite a large part of its network – limiting its ability to do so. However, video-on-demand and other related content-on-demand services are clearly planned by BT.

Broadcast TV regulation

The origins of television content regulation go back to regulating the five analogue terrestrial TV channels. This is illustrated in Fig G1.

	ITV1	Channel 4	Five
Tier 1	Basic broadcasting standards		
Tier 2	Independent production quotas		
	Regional production quotas		
	65% original	60% original	51% → 60% original
	News Current Affairs Regional News Other regional	News Current Affairs	News Current Affairs
Tier 3	Religion Children's Arts Education Documentaries	Religion Education Schools Multicultural + "Innovation"	Religion Children's Documentaries Arts Education

Fig. G1 Three Tiers of Broadcast Regulation

⁵¹ "BT gets its broadcasting licence" Graeme Wearden ZDNet UK, 05 March, 2002, accessed 29 March 2005 <http://news.zdnet.co.uk/communications/0,39020336,2105559,00.htm>

At tier one it is based on the idea of that each of these channels was an "uninvited guest" in the home. So regulation related to basic broadcasting standards concerning doing harm creating offence, fairness and the type of advertising that was allowed. An IPTV service is subjected to this regulation if it broadcasts (multicasts) TV through its infrastructure to the home.

Tiers two and three are based on the idea that scarce terrestrial television spectrum was provided in exchange for positive content commitments - that includes regional and independent production quotas for news, religion, children's educational and arts programmes. In the case of this form of regulation, it can be argued that an IPTV service can actually increase the availability of such provision and in many cases this would be better done through a video-on-demand service.

Video-on-Demand regulation

As the result of lobbying by the key players, the UK Communications Act 2003 left it open for providers of video-on-demand services to self-regulate themselves. Therefore, "The Association of Television-on-Demand" (ATVOD) was established to regulate the provision by its members of video-on-demand services within the UK. It's members currently comprise of NTL, Telewest (two cable companies now offering video-on-demand services since 2005) On Demand Group (who aggregate VOD content for NTL and Telewest, Video Networks, Kingston Communications and Blockbuster Entertainment (who have been running a trial of VOD services on Kingston Communications – Kingston Interactive TV service since 2003) code of practice.

The ATVOD has developed a code of practice for this self-regulation that is fully accepted by Ofcom. It deals with issues like protecting children and young people, advertising and sponsorship, commercial transaction services, complaints procedures and dealing with breaches in the code of practice.

BT will almost certainly need to join ATVOD and abide by its code of practice in order to keep Ofcom and UK government happy as it moves into such developments.

Internet Regulation

Internet content is not covered under the UK Communications Act 2003, but illegal content is dealt with by the Internet Watch Foundation and User centric control over what is accessed through Media literacy and Rating and filtering systems. This currently does not put any regulatory constraints in the way of IPTV services might be operated.

However, recently Lord Currie, chairman of Ofcom, has stated⁵² that "technology at the forefront of the internet could force new powers of regulation to protect and serve UK audiences". He told the Internet Service Providers' Association (ISPA) that the current system of self-regulation "may not always be the answer" although the net is currently beyond its scope.....advances in VoD services and broadcasting via broadband make the Web's content of primary concern".

⁵² "Net called into question" ContractorUK.com 31 January 2005
http://www.contractoruk.com/news/printer_001926.html

Conclusion

The light touch regulatory environment in the UK is perhaps something that should be adopted by also likely to encourage by other regulatory bodies throughout the world. Any country that wishes to impose heavyweight regulation might in case stifle economic and social development that could result as an expansion of IPTV services. Gartner analyst Jouni Forsman considers that "The trend of incumbents looking abroad for broadband expansion is only going to increase."⁵³ However, an uncertain regulatory situation in some countries may only stifle such developments.

⁵³ "For Telecoms in Europe, Turf Battles Are Escalating" By ERIC SYLVERS International Herald Tribune Published: March 14, 2005
<http://www.nytimes.com/2005/03/14/business/worldbusiness/14telecom.html?ex=1111467600&en=1ae2949486613394&ei=5070> accessed 18 March 2005

Appendix H - IPTV content and other interactive application services

The services that can be made available to the end user can be divided into: -

- Video rich or audio content
- Messaging applications
- Presence applications
- Games applications
- Transactional services
- Personalised Advertising
- WWW access

Users may buy into all the services or parts of the service depending upon what the service provider offers

Video-rich or audio content

Types of content to acquire could be in the form of: -

- Traditional broadcast content
- On-demand linear content
- On-demand interactive content
- User generated content

Most content would be non-exclusive but some content might be exclusive to the IPTV service provider giving them a competitive advantage over their rivals.

When acquiring content an IPTV service provider needs to consider a number of issues that can be partially considered in the context of the content distribution value chain (Fig H1). Most IPTV service providers are likely to come in at the content distribution part of the chain with the content being consumed by their customers. Although, in some markets there may not be an obvious content aggregator and IPTV service provider may need to take on this role.

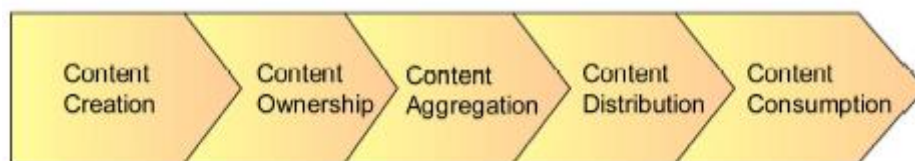


Fig H1 Content Distribution Value Chain Source: IDC⁵⁴

But, the further along the value distribution chain, the lower the revenues are likely to be from revenue sharing. This has been found to be particularly the case with Hollywood or Blockbuster movies. There is growing concern that just VOD offerings are unlikely to provide the returns on investment or create sustainable models, particularly as the studios are demanding a high percentage of revenue-per-view. As there is also a limited production of so-called “blockbuster” movies per year, the costs of acquiring distribution rights is unlikely to go down as they will go to the highest bidder – the dominant pay-TV satellite or the cable company.

⁵⁴ “Enabling IPTV : What Carriers Need to Know to Succeed” by Amy Harris & Greg Ireland, May 2005 IDC White paper http://www.emc.com/analyst/pdf/IDC_IPTV_WhitePaper_Jun_9_05.pdf accessed 26 September 2005

However, a recent report⁵⁵, suggests that those offering video-on-demand services should look towards the success of Apple's iTunes shop model. The "download to own" model being pioneered on the audio side could help drive movie video-on-demand spending. This might also take the content aggregator out of the chain increasing revenues for IPTV providers and would be linked to "a community of interest" strategy (described in Section 5 below).

Having access to niche linear and interactive on-demand content is also likely to be a big driver for the uptake of such services particularly as the revenue sharing model is more likely to be favourable for the IPTV service provider. Niche content is wide ranging. It could be catering for minority language groups within a region or for passions and interests as illustrated in Fig H2, H3, H4.



Fig H2 Kylin TV – access to 15,000 hours for 3 million American Chinese.

⁵⁵ Video-On-Demand: The Future of Media Networks – A Strategic Analysis of the US Market, Screen Digest and Adams Media Press Release 9 August 2005
http://www.screendigest.com/reports/vid_on_demand_us/FHAN-6F4C62/pressRelease.pdf

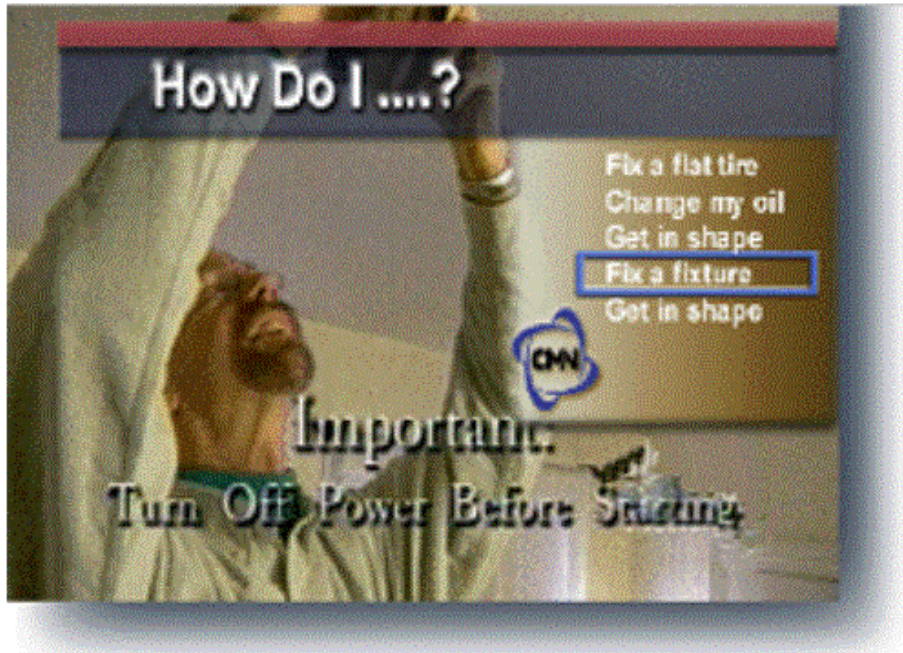


Fig H3 Do it yourself on-demand supplied by Chaos Media Networks⁵⁶



Fig H4 Lifestyle programming from Living.com⁵⁷

User generated content could also become a key component of an IPTV offering that will help to differentiate from a digital TV offering. Digital video cameras and services like MPEG Nation (Fig H5)^{58 59} have provided a low cost means of making still and

⁵⁶ Website of Chaos Media Networks <http://www.chaosmedianetworks.com/>

⁵⁷ Website of Living.com that run the Food Network, DIY Network and others accessible on the Internet and soon to be accessible on TV <http://www.living.com/>

⁵⁸ Digital Silo through its service called MPEG Nation They have launched a low-cost service to encode and stream consumer and commercial video content via its worldwide content delivery network, within minutes, via a simple upload from the end of March 2005 "MPEG Nation launches Streaming Video" Consumer Electronics.Net 30 March 2005 <http://www.consumerelectronicsnet.com/articles/viewarticle.jsp?id=31555>

video content accessible to friends and family via the web. Applications are emerging to make the content available via the TV. Content can be produced by individuals, local community groups, educational institutions, and local and national companies as well as numerous independent production companies and other creative individuals who would not normally have a presence on TV. Video Podcasting⁶⁰ also becomes possible and publishing onto the TV could be via a type of Media RSS⁶¹ tool.

MPEG NATION
share the stream™

The best way to host and stream your videos. Just \$4.95 one-time fee for unlimited bandwidth/views.

UPLOAD AND STREAM NOW

- 1 Upload your video file saved in nearly any video format from your PC or Macintosh.
Formats we accept: .avi; .mov; .mp4; .wmv; .asf; .div; .mpeg; .rm
Or Send Us Your Tape/DVD
- 2 We convert your video file into Windows Media, RealVideo & QuickTime streaming formats.
Windows Media™ Compatible, real, QuickTime
- 3 Link and stream your video stored at MPEG NATION from any blog.
LIVE JOURNAL, Blogger, msn Spaces
Link to your video from any auction site.

Fig. H5 MPEG Nation service taken from web site

Access to such content is already available via the web using video search engines from Yahoo and Google but as yet they are not very refined and the quality of content is still very variable. However, aggregating content around specific communities of interest where quality and relevance are catered for within an IPTV service could be

⁵⁹ "Digital Silo Introduces First Personal HVO D Delivery Platform" press release Digital Silo 30 March 2005 <http://www.digitalsilo.com/dsilo/dsilo.rsc?ssid=091502&dsload=pressroom&netop=redsilo>

⁶⁰ Podcasting is a method of publishing audio and video programs via the Internet, allowing users to subscribe to a feed of new files (usually MP3s). It became popular in late 2004, largely due to automatic downloading of audio onto portable players or personal computers. "Podcasting" in its strictest sense is distinct from other types of online media delivery because of its subscription model, which uses a feed (such as RSS or Atom) to deliver an enclosed file. Podcasting enables independent producers to create self-published, syndicated "radio shows," and gives broadcast radio programs a new distribution method. Listeners may subscribe to feeds using "podcatching" software (a type of aggregator), which periodically checks for and downloads new content automatically.

Source: <http://en.wikipedia.org/wiki/Podcasting> Accessed 12 October 2005

⁶¹ RSS = Really Simple Syndication or Rich Site summary. The technology behind RSS allows internet users to subscribe to websites that have provided RSS feeds; these are typically sites that change or add content regularly. Source: http://en.wikipedia.org/wiki/RSS_%28file_format%29 Accessed 12 October 2005.

Media RSS (MRSS) is a RSS module used for syndicating multimedia files (audio, video, image) in RSS feeds. It was designed by Yahoo! and the Media RSS community, and adds several enhancements to RSS Enclosures. Media RSS is used by content publishers to feed media files into Yahoo! Video Search, which is a feature of Yahoo! Search that allows to search for video files. This format has been getting increased attention, due to the development of Podcasting, which uses the Media RSS format as a means of delivering audio content to popular MP3-playing devices such as Apple Computer's iPod.

Source: http://en.wikipedia.org/wiki/Media_RSS Accessed 12 October 2005

Media RSS was first announced in a Yahoo blog in December 2004

<http://www.ysearchblog.com/archives/000060.html> It then announced the first version of Media RSS on 17 May 2005 with the aim of making it an open standard

<http://www.ysearchblog.com/archives/000111.html> Accessed 12 October 2005

a compelling service that provides access via to thousands or millions of video-rich content but is filtered around individuals' interests.

Messaging applications

The following services can be made available on IPTV: -

- Caller ID
- SMS text alerts
- Email alerts
- Voicemail
- Videomail – (using PVR to store message)

These applications could be bundled together and offered as part of the basic package or they might be value-added services. They could be particularly useful for keeping in contact with friends and relations who don't have a computer particularly as relations tend to be geographically more widespread and living longer as illustrated in Fig H6 for the USA.

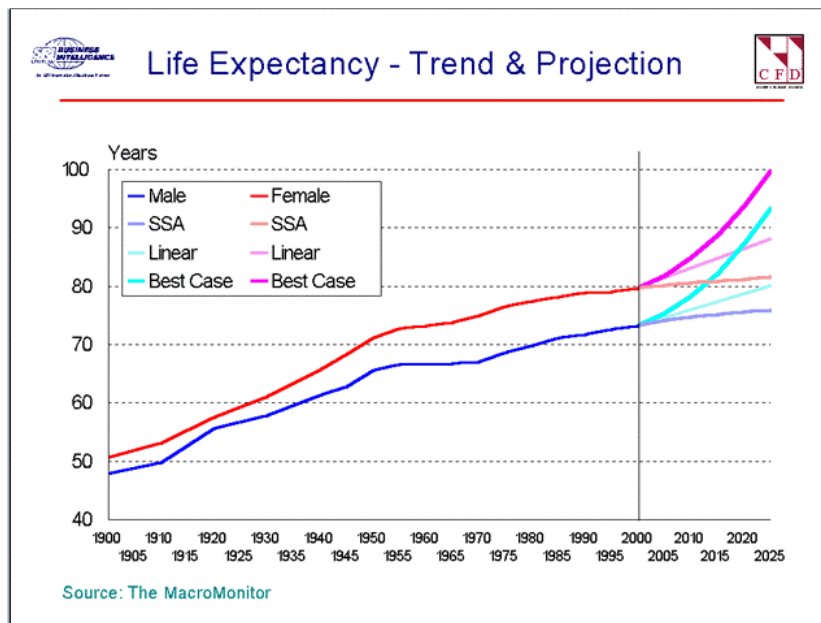


Fig H6 USA Life Expectancy Trends

Presence Applications

The following services can be made available on IPTV: -

- Video telephony
- TV community portal - friends (Buddy) list
- Voice communications and avatars
- Sharing emotions with friends

Video telephony or conferencing via the TV will start to become possible as the bandwidth increases. Fastweb in Italy⁶² have offered a service since 2002 to their customers using their fibre-optic service. It could be targeted at people who have

⁶² "Italy's FastWeb Offers the World's First TV-based Videocommunication Service with RADVISION Videoconferencing Infrastructure Solutions" – Radvision Case Study <http://www.radvision.com/NR/rdonlyres/828E5C29-8708-47EF-8000-0C6149CA0AE6/0/FastWebCaseStudy.pdf> accessed 23 September 2005

“cash rich – time poor” lifestyles or retired people who are less mobile but with incomes to afford the new technology. It also creates new opportunities for other video-added services. For example, premium service virtual travel agents to help people choose a holiday – if they don’t have time go to a travel agent or browse the web. Similarly, it could be used by estate agents and for seeking advice on healthcare matters – whether as a private service or as a publicly funded service. (See Fig H7)



Fig H7 A pilot public funded service for healthcare using one-way video

Other presence applications⁶³ have been developed like “Buddy lists” (Fig H8) enabling friends and family to see who is watching the same TV programme and interact with them via voice and avatars (Fig H9), using avatars for emotions (Fig H10) and splitting the screen into quarters to see each other avatar emotions. (Fig H11).



Fig. H8 Amigo TV community portal

⁶³ “Communication meets Entertainment: Community Television” by J. Bouwen, K. Vanderlinden, T. Staneker Technology White Paper Alcatel Telecommunications Review - 1st Quarter 2005
http://www.alcatel.com/doctypes/articlepaperlibrary/pdf/ATR2005Q1/T0503-Community_TV-EN.pdf
 Accessed 12 October 2005

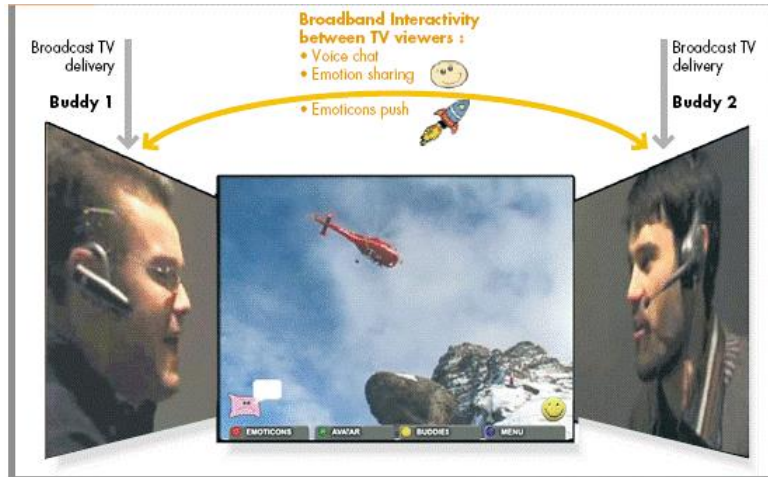


Fig. H9 AmigoTV voice communication & avatars

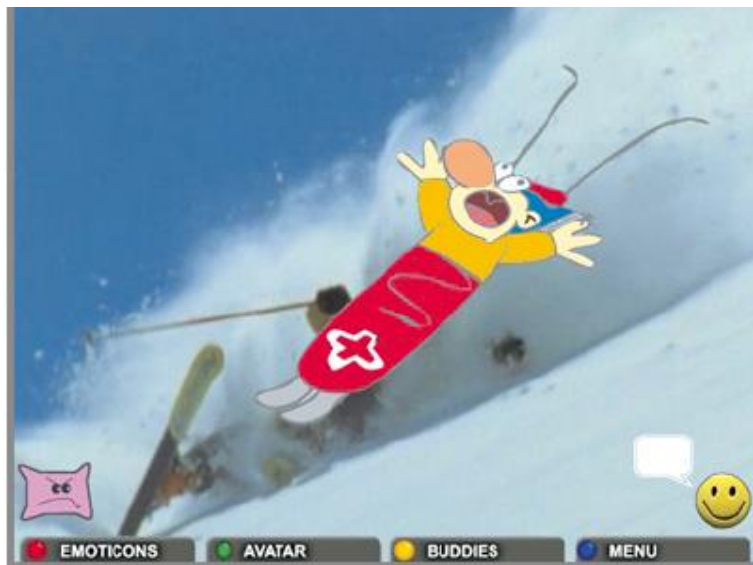


Fig H10 AmigoTV – Emotions



Fig. H11 AmigoTV – Sharing Emotions (bottom left) with four “buddies”

Games applications

Although not covered in any detail within this paper, there is a huge potential for generating revenue streams from TV-based online games. Companies like G-Cluster⁶⁴ for leading the market for broadband games-on-demand.

Transactional services

A transaction can involve some sort of interaction and process of exchange between the user in the home and another organisation. It may involve a financial transaction utilising credit cards or a Paypal⁶⁵ type service. The potential for such services is very large and could involve TV banking or TV Auctions – like an ebay on TV.

Government agencies could utilise a TV-based as another means of giving people access to e-government services if they don't have access to the Internet in their homes as a means of reducing social exclusion. Uptake by government agencies will be dependent on how extensive IPTV services are, but there could be opportunities for private-public partnerships particularly if it can be used as a means to provide wider access and reduce costs for government agencies including healthcare and education.

Personalised Advertising

Because every set-top box that is used in an IPTV service has its own unique address, it is possible for the service provider to know exactly what each household is accessing. In addition, each member of the household could log in with their own user ID enabling content accessed to be linked to an individual user. Although, there are issues relating to data protection laws that will need addressing – this unique ID creates new possibilities for more personalised advertising. This could operate by linking interests based on content watched to specific types of advertisements. Or users could opt in to watch certain types of advertisements that are likely to be of interest to them because e.g. they are interested in buying a new car. Another way is linking advertisements around communities of interest.

Because the advertisement is more likely to be of interest to the user, they are less likely to skip through it. The advertiser might also be willing to pay the IPTV service provider extra for showing the advertisement as it is more likely to reach the appropriate target group. IPTV also enables users to pause a programme that they might be watching and access a more detailed informational-advertisement that might involve a transaction before returning back to the programme that they are watching. (See Appendix A “The Impact of Personalised On-demand TV on Advertising”). Packet Vision⁶⁶ is one company developing an application that will enable IPTV service providers to run this type of service.

WWW access

Care needs to be taken when offering access to the web via a TV. Most web sites are not designed to be viewed on a TV. Although access to the web most be a desirable service it may be better to restrict content to websites that have been designed for TV – within a community of interest experience.

⁶⁴ Website of G-Cluster <http://www.g-cluster.com/>

⁶⁵ Secure website of Paypal <https://www.paypal.com/>

⁶⁶ Website of Packet Vision <http://www.packetvision.com/>

Appendix I - What is an IP Set-Top Box?

An IP set-top box (IP STB) is a device that receives digital TV channels from a broadband source, selects and decodes the appropriate audio-video streams, and eventually sends the final picture to the TV set to which it is connected.

The IP STB can integrate a modem and routing functionality. In such a case, it is directly connected to the socket that the telecom or multiple service operator has installed in the house. Alternatively, it is connected to an external modem (or router).

The IP STB can integrate a Hard-Disk Drive (HDD) which is used for recording and playing back audio-video content, in a richer way than a VCR. Alternatively, it can rely on storage capacity located on the telecom or multiple service operator network (remote PVR).

The IP STB integrates Copy-Protection and Digital Rights Management systems that allow business models to be built on such service deliveries.

The IP STB can offer broadcast TV content, like conventional terrestrial TV, but it can provide much more, such as:

- Real Video-on-Demand (VoD (more convenient than DVD rental shops),
- Extensive Electronic Program Guide (EPG) (richer than printed TV guide),
- Voice-over-IP (VoIP) and Videophony (digital telephony plus a Webcam),
- Rendering of PC stored content (music, movies, digital pictures, etc),
- Enriched Interactivity (e.g. voting, communities, gaming)
- Email and Instant Messaging,

These and many other functions make the IP STB *the* enabler for IP-based services delivered to the home.

Source: "Delivering Video and Advanced Services through IP Set-Top Boxes" - An industry summary by Royal Philips Electronics, September 2005 http://www.iptv-news.com/images/stories/IP_TV_White_Paper.pdf accessed 3 October 2005

Appendix J - Bringing the National Trust into the Home – a proposal

- a proposal from pjb Associates

Introduction

Most of what the National Trust has is “visually rich”. The television is traditionally the means of bringing “visually-rich” content in the home. However, what we receive on our TV sets has tended to be controlled by broadcasters who have had large budgets to produce high-quality productions. Some excellent programmes have been produced, but have tended to only be available when the viewer makes an appointment to watch at the time they are broadcast.

Over the years technology has enabled people to record a programme and thus “time-shift” the viewing experience. “Visually-rich” content-on-demand services to the TV are now rapidly emerging across various parts of the world and have in fact been in existence, although on a small scale, in London and Hull for around four to five years.

The Internet with its web-based environment has created a gateway for vast amounts of resources to be easily available in the home through an internet-enabled computer. As of July 2005 around 7.5 million UK households and 160 million worldwide have access to an always-on broadband connection – that could also be connected to a TV as well as a computer.

First generation websites have tended to offer rather flat, text based content and informational in nature, rather than engaging and immersive experiences that have been offered through the TV. However, this is now all changing as broadband content-on-demand and other TV-based services are rapidly developing across the world including the UK.

This will mean that people will be able to customised and personalised content according to what they want to watch and when they want to watch. In addition they will be able to search for content and access video-clips or audio-clips with still pictures lasting just a few minutes or it could be a full-length feature. Content could be freely available perhaps linked in with promotional material or personalised advertisements. Alternatively, people could subscribe monthly or just make micro-payments of just a few pence for a video-clip. Opportunities also exist for non-professionally produced content like video diaries from foresters and nature reserve wardens.

Opportunity

The opportunity now exists to create an always accessible National Trust engaging presence on the TV in the home. This not only creates new business opportunities for marketing and selling “visually-rich” content, it will also create opportunities for enhancing the whole experience of visiting a National Trust property. Before and after a visit people could access content from their armchairs that would help them learn more about the geography, history and biology associated with the property.

The equipment that is used to access the TV-based content has a unique address. This means people who opt-in, could be sent personalised details of local or national events and activities that are of interest to them directly to their TV sets – thus creating a greater sense of community and increasing loyalty. Other ways of increasing a sense of community and loyalty could be in the form of providing links to visitor or volunteer produced video content. There are also opportunities for clustering and aggregating

localised advertisements like accommodation around a specific property that might be viewed.

It also creates opportunities to reach out to other people who may not have been exposed to the more traditional approaches that the National Trust has used before. The educational opportunities are immense.

Scenario

Just one possible scenario: -

Kate and Carlos plan to take their children on another visit to Wicken Fen, but from past experience the children tended to rush around the boardwalk as quickly as possible in order to buy an ice-cream at the end. But, this time they want to make it a more engaging experience. Sitting together, using their TV, they search for Wicken Fen and find a seven minute video on its history – that is free to them as they are members. Non-members would make a small payment – a few pence – that goes on their next telephone bill. Although the video can be viewed at the visitor centre it is far more comfortable to view at home.

Next, they access some pictures with an audio commentary of the birds and beetles that they are likely to see during a visit. On return they will enter a competition via the TV to see how many creatures they can recognise. The names of the top ten winners appear on the screen. Just before they depart they pay and download onto their mobile telephone an audio nature trail commentary and pre-book a cream-tea in the National Trust café – very useful for staff to understand demand for the day. Kate also notices that there are links to local accommodation and sends the link to friends in Australia who will be visiting East Anglia in a few months time. National Trust not only receives advertising revenue for this but can also receive revenues from clicks of interest and confirmed bookings.

During their visit they meet the National Trust warden – who mentions that she produces a weekly video-diary accessible on the web and on the TV – nothing professional – but visitors seem to find it interesting and often return time a time again. A few years later the children become volunteers at Wicken Fen produce their own videos that are also accessible on a TV.

Proposal

From this initial concept we would like to conduct a Feasibility Study that would identify the options for the development of sustainable business models for the running of such a service. “Bringing the National Trust into the Home” – through TV presents a new opportunity for engaging people in the work and activities of the National Trust – in a way that is has not been possible to do before even on the web.

Working with the National Trust we would like to identify a source of funding for the Feasibility Study – possibly from external sources.

Although pjb Associates is a small consultancy we have been involved with personalised TV developments for several years and have written various reports for the European Commission and English national agencies. In addition, we are closely involved with players in the industry who are developing such services and have also had some initial discussions with one UK National Museum.

If you would like to discuss the possibilities and opportunities in more detail please contact Peter Bates, Senior Partner, pjb Associates, 52 St Andrews Way, Ely, Cambridgeshire, CB6 3DZ Tel: +44 1353 667973
Email: pjb@pjb.co.uk Web: <http://www.pjb.co.uk>

Plagiarism declaration:

Some of the papers that appear as appendixes in this report were published as “thinkpieces” on the author’s company website and in other locations during the project. They form original thinking that has been developing during the project that has resulted in the writing of this final report.

As this final report has been evolving from thinking related to MINE courses and assignments produced for these courses, elements of other work produced in more detail for other assignments have also been included when appropriate. However, they have been modified and developed to fit into the purpose and context of this final report.

DECLARATION

I confirm that this report describes a project done by myself and that it was not copied from any other person’s work, or my own (published or unpublished), except for what I have stated above, and that it has not previously been submitted for assessment in any other context. I have read and I understand the note on plagiarism in the Report Regulations on the Intramine Website.



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