

## **Appendix A Country by Country Overview**

### ***Introduction***

This Appendix provides a country-by-country overview of how digital TV in a broadcast and in a more personalised TV mode is developing across the world, in terms of prospects for the development of learning services through interactive digital TV.

Developments are in a very dynamic state and it is very difficult to capture all the latest developments in all the countries all at once. However, it is hoped that this Appendix provides a snapshot of developments up till mid 2002 through to March 2003. The statistics should be used with caution as they are very likely to be out of date and may not be comparable, as they may have been acquired from various sources. However, they have been included to give an indication of trends and developments in each country. As of early 2003 it is unlikely that many households will have more than one digital TV platform but over the medium to longer term this will increasingly become the case thus making it much more difficult to get a clear indication of penetration of digital services to households.

There is also a lot of complexity in the form and nature of content that is on the different satellite, cable and digital terrestrial platforms. Some platform operators source their own content and some just use their platform as a means of developing other service providers content.

This appendix has not attempted to go into details about these complexities, as this will distract from the overall trends and developments. It has focused on overall infrastructure developments and identified any interactive TV service developments. Where it is known that educational use is made of interactive TV this is mentioned. However, there are very few examples.

This Appendix does not cover developments concerning the accessing of television services via a computer in the home except when it is likely that such a service could also eventually be made to the TV via an appropriate set-top box.

It has been difficult to do a comprehensive survey of local initiatives in providing broadband to the home or to blocks of flats, but where these have been identified they have been included as there is also the potential for utilising them for personalised learning services to the TV as well as to a home computer.

It should be acknowledged that some information of the European countries in this Appendix has been based on the "European Interactive Television Report – Technologies, Application and Market Overview" published by Van Dusseldorp & Partners in August 2002. However, considerable additional and

updated information has been provided and reference has been made to the sources.

## **Europe**

### **Austria**

There is little evidence to suggest that developments towards interactive services have progressed much since 1999. The dominant public service broadcaster ORF (Austrian Broadcasting Corporation) does not currently appear to be offering any interactive digital broadcasting services; nor has any plans for interactive education and training services. There are no Austrian-originated commercial TV broadcasters, but a large number of German satellite channels are available to households with a satellite dish. This includes digital channels offered by Premiere. Austria, tends to have to rely on content from Germany and as Germany has few interactive services little appears to be available in Austria.

However, broadband technology does appear to be taking off quite rapidly. One in two Internet users in Vienna uses broadband, according to research by market research company OGM. Chello is the broadband market leader in Vienna, with 80% of the market. 44% of the total Internet access market is Chello customers, 31% is Jet2Web (Telekom Austria) customers and 13% uses UTA. 84% of the Viennese households has Internet access<sup>1</sup>.

### **Cyprus**

It appears that Cyprus has plans for a broadband TV deployment using ITV-over-DSL specialist - Thirdspace Living. In November 2002 it was announced that Thirdspace had been chosen by the incumbent telephone company Cyprus Telecommunications Authority (CYTA), on the island to provide an interactive broadband services platform. The platform is currently being tested and will be rolled out to an initial group of 10,000 customers during 2003 (if it proves successful, CYTA plans to eventually offer it to all the 220,000 households it services, as well as in 100,000 hotel rooms). There are currently no local cable or satellite services on the island, and CYTA, which recently launched an ADSL service (branded "i-choice"), is looking to take advantage of its networks' broadband capacity to provide a substitute. The new platform will initially offer multichannel programming and VOD, and may at a later stage include an EPG, Internet-over-TV, and support for 3rd-party ITV applications. Thirdspace is providing a headend system based on its Open Video Server and Open Video Applications software. Other vendors involved in building the new platform include Kreatel (is supplying IP-based set-top boxes for the initial market trial), Nextream (is supplying a broadcast headend), and Concurrent (is supplying a video server platform that will be deployed in a distributed edge and core server architecture)<sup>2</sup>.

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<sup>1</sup> **Telecom.paper**, 14 August, 2002

<sup>2</sup> Thirdspace - press release 28 November 2002. <http://www.thirdspace.tv/news28Nov02.htm>

## Denmark

Denmark is the second European country in terms of digital television penetration, surpasses the 25% mark. Digital television market country is divided between cable and satellite broadcasting systems.

Satellite providers Viasat (MTG) and Canal Digital (Telenor) offer digital and interactive television services in Denmark.

Stofa (Telia) and OnCable (TDC Group) dominate the Danish cable market. Likewise in the other Scandinavian markets, the satellite sector is divided between Viasat (MTG) and Canal Digital (Telenor). OnCable is Denmark's largest cable company with 828,000 households actually subscribed to the services. Of these, a mere 50,000 are connected to digital television. Although it's trying to expand its digital television operations. OnCable also offers broadband Internet connections via its cable networks. Had around 25,000 subscribers to this service. Telia-owned Stofa is the second largest cable operator in Denmark. Its cable networks reaches 610,000 households, of whom 250,000 actually subscribe to the service. Stofa managed to obtain a relatively high number of subscribers to its broadband cable Internet service.

Denmark is actively participating in the NorDig. The NorDig members (Sweden, Norway, Finland, Denmark and Iceland) have agreed to use the DVB-MHP standard for satellite, cable and terrestrial digital broadcasting<sup>3</sup>.

Danish broadcaster TV2/Nord has launched Denmark's first digital TV channel<sup>4</sup>, despite the fact that digitalisation of the terrestrial transmission network has yet not been completed. The broadcaster has poured Dkr50 million (€ 6.75 million) into the set-up of TV2/Nord Digital, which will transmit 2 hours of regional TV programming every day between 20:00 and 22:00 with some repeats the following day. The digital channel will enable TV2/Nord to broadcast more regional news, since regional programs are currently restricted to 'windows' in the national TV2 channel schedule. It will initially only be available to some 500 cable homes in the Northern municipality of Frederikshavn, but plans are to reach up to 2,000 households by the beginning of 2003.

The permission to digitalise TV2's broadcasting network in North Denmark has now been granted by the Minister of Culture, and the next phase will see the erection of DVB-T transmitters and the development of interactive TV content. Meanwhile, the Danish government has issued a White Paper, identifying 2007 as the analogue switch-off deadline.

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<sup>3</sup> Medier I Norden (2001). 6 March 2001: *important agreement between NorDig members on common and open digital television standard*. [WWW-Document]

[http://www.nmn.org/engelsk/01-1\\_e.htm](http://www.nmn.org/engelsk/01-1_e.htm)

<sup>4</sup> "Denmark gets first digital TV channel 3 December 2002" – Digital TV Group Web

[http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/\\_menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/_menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

TV2/Nord has opted for MHP compatible digital boxes manufactured by ADB Global which will be offered free of charge to customers until 1 January, after which the box will be offered for the promotional price of DKr240 (€32.33) for a six month period.

Telia<sup>5</sup> is the only operator to offer high bandwidth via ADSL in the Danish market. Plan to offer more specific video-on-demand services. Services are accessible to residents in the greater Copenhagen area. ADSL market offering is based on high speed Internet services and not for television.

Digital and interactive television in Denmark is still limited. ROFL, which translates as 'value for pocket money', is a live, interactive television show broadcast by DR (The Danish Broadcasting Corporation). ROFL is an infotainment format that crosses the line between consumer education, entertainment and marketing for its adolescent audience.

NESA, the largest electrical utility in Denmark, has plans to supply broadband via Fibre-To-The Home (FTTH) that will allow the network to carry at least a "Triple Play" of services, including TV, telephony and data. NESA plans to build a network capable of delivering services to over 200,000 customers in the municipalities of Greater Copenhagen and Northern Zealand over the next ten years<sup>6</sup>.

## France

France has a population of approximately 60m with about 24m households. In 2001 approximately 14.5% of French households had access to digital satellite TV and another 3.1% to digital cable<sup>7</sup>. Based on 1999 figures over 25% of household could access the digital cable network<sup>8</sup>. Digital terrestrial television (DTT) is unlikely to be available until at least late 2003 at the earliest with large-scale roll out unlikely before 2005 or 2006.

Based on 2000 figures collated by IDATE<sup>9</sup> about 10% of households have access to various interactive services and a digital pay-TV household is younger than the national average and is predominately consisting of families with at least one child between 0 and 14 years old. The typical digital television-receiving household is situated in a small town of less than 20,000 inhabitants and owns more computer, television and video equipment than average.

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<sup>5</sup> Telia (17/04/02). *Telia first with genuine broadband for all ADSL customers.*

[WWW.Document]

[http://www.telia.com/bvo/omdirigerig/tvaramar.jsp.html?body=http%3a%2f%2fhan16ns.telia.se%2fTelia%2fthk%2fthkpre70.nsf%2fvNyhetEfocusEng%0d%0a&refoid=Press+Archive\[19/04/02\]](http://www.telia.com/bvo/omdirigerig/tvaramar.jsp.html?body=http%3a%2f%2fhan16ns.telia.se%2fTelia%2fthk%2fthkpre70.nsf%2fvNyhetEfocusEng%0d%0a&refoid=Press+Archive[19/04/02])

<sup>6</sup> PacketFront Press release "NESA, Denmark's Largest electrical utility, selects PacketFront and IBM for true Broadband via Fibre-To-The Home (FTTH)" 16 December 2002

<http://www.packetfront.com/snews.php?id=4>

<sup>7</sup> Estimates from Commission of the European Communities (2001) Seventh report on the implementation of the telecommunications of the telecommunications regulatory package, Annex 2

<sup>8</sup> Idate (2000). Development of TV in Europe, 2000 Report, France

<sup>9</sup> Based on Idate (2000). Development of TV in Europe, 2000 Report, France

It appears that the focus of French government policy has been mainly towards increasing choice and quality of the television on offer for French citizens with little attention being paid to encourage interactive services<sup>10</sup>.

**France – DTV per access platform<sup>11</sup>**

<i>Operator</i>	<b>Market Share</b>
Satellite	
Canalsatellite	52.8%
TPS	29.7%
Other Satellite operators	0.7%
Cable	
<b>Noos</b>	10.5%
<b>NC Numéricâble</b>	3.4%
<b>France Telecom Cable</b>	2.6%
<b>Other Cable Operators</b>	0.3%
Terrestrial	<b>0.0%</b>
<i>Total</i>	<b>100.0%</b>

The main French operators, Canalsatellite<sup>12</sup>, TPS<sup>13</sup> and Noos<sup>14</sup> (cable) all have their own decoder set-top box. Canalsatellite and NC Numéricâble use Mediahighway and TPS, France Telecom Cable and Noos used OpenTV. Although parties appear to have a positive attitude to the common MHP standard, no application using this platform appears to be planned and MHP does not appear to be particularly encouraged by appropriate French authorities.

No specific interactive digital TV learning services of any kind appear to exist although there are some interactive games and looking up information on children's channels from the producer Lagardère<sup>15</sup>, supplied by all the digital cable service providers. Lagardère and Canal Plus through a joint venture produce - Tiji – a channel for small children that has a number of interactive games.

France Télévision, the main French public television operator that has three channels France2, France3 and France5 appears to occasionally offer interactive services through Canalsatellite and TPS<sup>16</sup> although nothing specifically educational. However, when Digital Terrestrial services become available this might change, as one new channel has been earmarked as a cultural channel – whereas France5 already has a culture and learning focus.

<sup>10</sup> "European Interactive Television Report – Technologies, Application and Market Overview" published by Van Dusseldorp & Partners in August 2002, P.133

<sup>11</sup> Originally based on figures from Idate (2000). Development of TV in Europe, 2000 Report, France

<sup>12</sup> Canalsatellite web site <http://www.canalsatellite.fr/instranet/site/home/>

<sup>13</sup> TPS web site <http://www.tps.fr> (in French)

<sup>14</sup> Noos web site <http://www.noos.fr/> (in French)

<sup>15</sup> Lagardère web site is <http://www.lagardere.com/us/>

<sup>16</sup> "European Interactive Television Report – Technologies, Application and Market Overview" published by Van Dusseldorp & Partners in August 2002, P.150

Lagardère has also developed for Canalsatellite a text and picture information service that include topics like cooking “Elle cuisine”.

The interactive services on the main private television channel TPS appear to be limited<sup>17</sup>. However, TPS - who is a satellite operator as well as transmitting content to third parties, does have a separate interactive services division, TPS Interactif, offering a wide variety of interactive services but nothing specifically focused towards learning. It is understood that TPS plan to offer an interactive TV enabled Children's Channel called "Eureka" but no official announcement had been made by early March 2003.

French terrestrial TV channel, TF1 announced plans in March 2003 to roll out VOD-enabled ADSL-based TV service over the next 3 years. The channel has been conducting a 6- month, 200-household trial of the service in Paris.<sup>18</sup>

In November 2001 At-sky<sup>19 20</sup> in partnership with SES Astra started broadcasting selected web-TV Internet sites via satellite, however now it is marketing an @Sky box that is also a satellite receiver but for television. It has two common interfaces and a smart card reader that can also connect it to a personal computer with the @Sky video link pack. This enables digital TV programmes to be recorder onto the computer's hard disk. It is marketed with the Infocast<sup>21</sup> service aggregates over a hundred TV-Web operators whose video productions are encoded in high digital quality. Users can choose from various thematic bouquets and have them delivered and automatically updated to the @Sky box. A potential next stage is to utilise a personal digital video recorder to store the multimedia content that is delivered in an MPEG-2, VCD and WAV digital quality formats.

Two French multimedia companies Alcatel and Thomson Multimedia have announced a joint venture – Nextream<sup>22</sup> - that they have jointly produced a decoder box that can link ADSL to television equipment. It is likely that ADSL developments will take a significant role in the distribution of interactive television services in France particularly as digital terrestrial roll out looks like being delayed until 2005 or 2006. The largest DSL operator, Wanadoo (1m subscribers) appears to have almost the same subscriber base as the smallest satellite operator, TPS (1.2m subscribers) and may be cheaper to

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<sup>17</sup> “European Interactive Television Report – Technologies, Application and Market Overview” published by Van Dusseldorp & Partners in August 2002, P.153

<sup>18</sup> Source: itvt Issue 4.97 Part 1

<sup>19</sup> At-Sky web site <http://www.atsky.fr/eng2/index.htm>

<sup>20</sup> @Sky Press Release [http://www.atsky.fr/eng2/html/part5/chap1/com\\_pdf/PR\\_YANKEE-TV\\_UK.pdf](http://www.atsky.fr/eng2/html/part5/chap1/com_pdf/PR_YANKEE-TV_UK.pdf) 25 April 2002

<sup>21</sup> More information at <http://www.atsky.fr/eng2/html/part2/index.htm> Also the Infocast web site (in French is at <http://www.infocast.fr/accueil2.htm>)

<sup>22</sup> Nextream home page <http://www.nextream-online.com/nextream/> Also see press release at <http://www.nextream-online.com/nextream/news/default.asp?theme=pressroom&NewsID=9&NumPage=2> and also <http://www.nextream-online.com/nextream/news/default.asp?theme=pressroom&NewsID=19&NumPage=2>

distribute niche content via DSL rather than satellite assuming that a user has a computer to access it<sup>23</sup>.

## Finland

Out of 2.3m households only 3.7% were digital in 2001 – the latest figures available. Digital satellite is available from Canal Digital and ViaSat as in other Scandinavian countries.

Digital Terrestrial TV was launched in Finland on 27 August 2001 but the lack of MHP set-top boxes has caused major problems and uptake has been very slow. The public service broadcaster YLE is broadcasting in digital and YLE Teema has a channel with culture and education programming and some limited interactive services. Sanoma-WSOY, Finland's largest media concern, announced that its educational channel would not broadcast after all despite originally planning to offer such a service.

In December 2002 the Finnish Ministry of Traffic & Communications has announced its decision over the allocation of the three DTT network transmission licences, and to much surprise, it has awarded all three to Finnish terrestrial transmitters owner-operator Digita<sup>24</sup>.

Sofia Digital<sup>25</sup> is the Finnish company that won the bid for the main MHP services used for interactive television nationally. It is the leading software solution provider of DVB-MHP for digital and interactive television applications.

The telecommunications companies tend to back most cable networks. As much as 62% of households are passed by cable, while 40% actually subscribe to cable television. According to estimates, more than half of the houses passed by cable networks are able to sustain digital services<sup>26</sup>. However, the digital upgrading has only attracted 10,000 subscribers so far.

There are about 40 CATV companies in the country serving an average of 20,000 households each. Helsinki Television and Sonera (the incumbent

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<sup>23</sup> This was based on an item posted on Broadbandbananas discussion forum on 2 February 2003 18:34 hrs by Ciaran Quinn, VEO, Ltd., Paris, France [cquinn@veo.net](mailto:cquinn@veo.net) who argues that "For the smallest niche channels (well less than 1% of total viewing), it looks like someone may be better off financially by distributing their channels over DSL instead of over Satellite. Assuming that the cost is 900K Euros/year for the satellite bandwidth, and that the niche channel is only viewed by 10K households, then someone is paying 90 Euros a year in delivery costs per home. At 500kbps 90 euros per year could buy 1-2 hours streaming per week per subscriber. At the least, they may be able to continue to broadcast, but also capture potential viewers of, say, 'Hunting and Fishing' who don't want to subscribe to a satellite bouquet. 'Course, that assumes that such a viewer has DSL, prefers to watch 'Hunting and Fishing' on a PC instead of a TV, and is willing to pay H&F to watch. This will become much more attractive as the Wanadoo sub base doubles in 2003."

<sup>24</sup> Digital TV Group [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

<sup>25</sup> SofiaDigital (December 2001). *Starting the World's First Regular MHP Broadcast*. [PDF-Document] [http://www.sofiadigital.com/publications/\[14/03/02\]](http://www.sofiadigital.com/publications/[14/03/02])

<sup>26</sup> Digitv.fi. *The cable network*. [WWW>Document] [http://digitv.fi/english/sivu.asp?path=9;1236;1350;1358\[19/03/02\]](http://digitv.fi/english/sivu.asp?path=9;1236;1350;1358[19/03/02])

telecoms provider); minor operators are Tampereen Tietoverkko Oy, Turun Kaapelitelevisio Oy, and Oulu TV Oy.

Ortikon Interactive has released the world's first interactive service package based on the MHP standard for digital cable television. The system has been delivered to the Finnish cable operators Suomen 3KTV and Vaasa Telephone Company, VLP. 3KTV is the biggest cable-TV operator in Finland with its more than 280 000 customer households, and VLP has more than 76 000 customer households. 3KTV and VLP will utilize ORTIKON ACE(TM) platform for their value-added interactive digital TV services. Services have started as a pilot operation with a limited group of users and they will be enlarged to the full customer base during Spring 2003<sup>27</sup>.

A subscription to a Sonera ADSL<sup>28</sup> service allows users to watch television and movies from the Internet. In March 2002 Elisa Communications launched the very first broadband TV service in the Nordic region<sup>29</sup>. ElisaCom provides television services over the telephone network using a broadband connection. Subscribers can surf the Internet, watch television and talk on the phone simultaneously over the same network. The service is presently available in the East Helsinki area, however extension plans includes the greater Helsinki area.

A number of fibre optic project pilots are currently being developed in the country's municipalities whose involvement is also commercial. Broadband Village (BBV)<sup>30</sup> where residents can benefit from a multimedia communication system via an ATM network with Ethernet house connections. The infrastructure that was built in the Village, Ylöjärvi, was completed with the co-operation of TPO Omnitele, Nokia and ICL. Sonera is participating in different trials with other municipalities. The Maxisat Oy Company<sup>31</sup> provides the broadband television content. Service extensions will be video-on-demand, Internet gaming and a recorder.

## Germany

With a population of 82 million and 33 million households, Germany is the largest television market in Europe. It has the largest cable market (around 19

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<sup>27</sup> Ortikon Press Release "Finnish Cable TV Operators chose Ortikon Interactive" 19 November 2002

<sup>28</sup> Sonera(2002). *Sonera's broadband subscriptions now available also in the metropolitan area (Press release)*. [WWW.Document]  
<http://www.sonera.com/CDA.COM.ArticleFrame/0,1395,articleId%3D7295%26expandSize%3D2%26expandLevelId%3D638-616-%26hierarchyId%3D638,00.html>[19/03/02]

<sup>29</sup> Elisa Communications Corporation (04/03/2002). *The First Broadband TV in the Nordic Countries launched*. [WWW.Document]  
<http://www.elisa.com/elisacom/index.cfm?t=7&o=7120.00&did=6008> [15/03/02]

<sup>30</sup> BdrC Ltd and European Commission Directorate General Information Society (2001). *The Development of Broadband Access Platforms in Europe. Report*. [PDF-Document]  
<http://europa.eu.int/information-society/eeurope/news-library/new-documents/broadband/index-en.htm> [18/03/02]

<sup>31</sup> Elisa Communications Corporation (30/09/2001). *Elisa communications corporations' Interim Report, January-September 2001*. [WWW.Document]  
<http://www.elisa.com/elisacom/index.cfm?t=7&o=7500.00>[15/03/02]



million households), and the largest satellite market (around 12 million). There are four major broadcasting groups ARD, Kirch Gruppe, RTL and ZDF Using cable, satellite and analogue terrestrial. However, a large number of households still receive analogue broadcasts but they have all agreed on the future use of MHP as their standard for DTV<sup>32</sup>.

Digital broadcasting is clearly lagging behind penetration in other European countries such as the UK and Spain. The IDATE Report<sup>33</sup> 2000 states that a “major reason for this rather dissatisfying development is the competition from the large offer of free-to-air programmes, either via cable or satellite”.

Analogue cable is the dominant means of TV distribution in Germany. Until recently<sup>34</sup> the majority of cable backbone networks were owned by Deutsche Telekom. Satellite reception is less widespread than cable among DTV users. DTV reception via satellite has been growing faster than via cable<sup>35</sup>.

Berlin became the first German city to turn off its analogue signal and only broadcast their television and radio programmes digitally. The quality of digital signals is better and viewers will be able to receive more stations, but there are concerns over the need for the expensive new technology<sup>36</sup>.

Berlin's DTT offering now comprises ARD and ZDF, their regional affiliates SFB-B1, ORB Fernsehen, MDR Fernsehen and NDR Fernsehen, public thematic channels Phoenix, ARTE, KI.KA, ZDFinfokanal, ZDFdokukanal and commercial channels RTL, RTL II, Super RTL, VOX, SAT.1, Pro Sieben, Kabel 1 and N24. A test channel with a weaker signal carries MTV Deutschland, Eurosport and German news channel n-tv. It is expected that FAB, regional public broadcaster WDR Fernsehen and a BBC service will be added shortly. DTT has proven to be a great success since its introduction, with DVB-T receivers selling out quickly. Around 20 models are available, with prices ranging from €179 to more than €1,000. According to local media authority MABB, more than 65,000 DVB-T receivers have been sold - an impressive figure, bearing in mind the overall apathy German households have so far held for acquiring set-top boxes. The new channels and those planned will undoubtedly further increase demand<sup>37</sup>.

Following the DTT implementation in Berlin-Brandenburg, which will result in the German capital city and its surrounds being the world's first digital-only

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<sup>32</sup> News about ARD [http://www.dtg.org.uk/news/world/-ard\\_opentv.htm](http://www.dtg.org.uk/news/world/-ard_opentv.htm)

<sup>33</sup> Idate and Salzburg Research Forschungsgesellschaft mbh (2000). *Development of Digital TV in Europe 2000. Report Germany*. [PDF-Document] <http://europa.eu.int/information-society/topics/telecoms/regulatory/studies/documents/dtv-euro2000.pdf> [23.02.2002]

<sup>34</sup> Woldt, Runar (2002). *Konturen des digitalen Kabelmarktes. Sind Vielfalt und offener Zugang gewährleistet?* In *Media Perspektiven* 1/2002:34-49.

<sup>35</sup> Keinath, Annette (2000) *Fernsehempfang und PC/Online-Ausstattung in Europa*. In: *Media Perspektiven* 10/2000:451-457,453.

<sup>36</sup> Article “Berlin To Shift To Digital TV, Radio By 2003” [http://dw-world.de/english/0,3367,1446\\_A\\_661280\\_1\\_A,00.html](http://dw-world.de/english/0,3367,1446_A_661280_1_A,00.html)

<sup>37</sup> Source: Digital TV Group Website [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/\\_menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/_menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

metropolis this summer, Germany is stepping up the deployment of digital terrestrial throughout most parts of the country. According to a leaked internal strategy paper by the federal media authorities, DVB-T will be implemented in regional states North-Rhine Westphalia, Lower Saxony, Bavaria, Hessen, and possibly Schleswig-Holstein from 2004. A question mark still hangs over Hamburg and Bremen, but the media authorities are confident that the issues will soon be resolved<sup>38</sup>.

While Internet access via cable is not very common because of the missing upgrades of the backbone networks, Deutsche Telekom's aggressive marketing policy, flat-rate offer and privileged starting position as the incumbent phone line operator have put Germany in a top position when it comes to DSL subscribers. Deutsche Telekom's ADSL service reached more than two million subscribers at the beginning of 2002<sup>39</sup> and 2.8m by January 2003. T-Online<sup>40</sup> launched a dedicated broadband portal in March 2002

T-Online who plan to launch their "T-online Vision service on TV"<sup>41</sup> probably in September 2003 are also using a Fujitsu Siemens ACTIVY Media Center PVR/set-top box.

T-Online describe their forthcoming service as a platform to bring online services into the living room. The ACTIVY Media Center will provide users with a T-Online Internet portal that has been optimised for use with a TV set as the terminal device. This portal will offer the latest news and information from the fields of entertainment, sport, movies, music and games. Email communications services will also be available. The digital video recorder that is integrated into the device makes it possible to record programs.

The ACTIVY Media Center can be programmed by remote control using the Electronic Program Guide (EPG). The time-shift function enables users to interrupt the transmission of a live program for a while - and then continue where they left off at any time. The ACTIVY Media Center also has DVD drive that can handle a range of formats including DVD, audio CD, MP3 or Windows Media, and play them on the TV set or put them through a stereo or Dolby Surround system. In order to access T-Online Vision on TV, the customer must purchase an ACTIVY Media Center and connect it to the TV set, the antenna cable and T-DSL - or through access to a different broadband provider.

Fujitsu Siemens will be selling their ACTIVY Media Center directly to customers through specialist retail outlets and depending on the model bought, it is likely to retail initially at around 800-1200 Euro. Obviously the cost

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<sup>38</sup> Digital TV Group Web Site [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/\\_menu.html+reference/dtt\\_world/\\_dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/_menu.html+reference/dtt_world/_dtt_world_index.htm+World%20Watch)

<sup>39</sup> Stegers, Fiete (2002). *Deutsche Telekom reaches 2 million ADSL customers landmark*. [WWW-Document] <http://www.europemedia.net/shownews.asp?ArticleID=7533> [27/03/2002]

<sup>40</sup> T-online web site <http://www.vision.t-online.de>

<sup>41</sup> T-Online Pres Release "T-Online presents 'T-Online Vision on TV at the CeBIT' 12 March 2003 <http://ueber.t-online.de/uebe/pres/ar/CP/ar-030312e-iTV.html>

will go down particularly when other competitors will start to offer a similar Media Center device. However, currently there is hardly any other competitor.

In February 2003 Europe Online<sup>42</sup> has announced<sup>43</sup> that it will provide video-on-demand services for set-top boxes using the Fujitsu Siemens ACTIVY Media Center<sup>44</sup> PVR/set-top boxes equipped with Datacargo's Visiongate software<sup>45</sup>. Europe Online claims to have 60,000 registered users for their broadband satellite service that delivers content to a computer. The computer has to be connected to a satellite receiver via a digital video broadcasting (DVB) PC card installed in the computer.

Although no launch date has been announced for the TV-based service yet, it will enable video-rich content to be order via a dial-up Internet connection and it will then be broadcast via satellite by a guaranteed time and stored on the PVR/set-top for using at a time convenient to the users. Currently, Europe Online's main market is Germany.

Fibre-to-the home FTTH<sup>46</sup> also has little importance, even though there are around two million households connected to fibre phone networks. Ironically, Deutsche Telekom<sup>47</sup> says it has problems connecting them to its preferred ADSL system instead of focusing on original FTTH access.

In collaboration with ISP Arcor, Premiere<sup>48</sup> has announced a video-on-demand platform on the Internet in order to use its existing contents to generate further revenues. Interactive services on the PremiereWorld platform are limited. RTL has not been very active in the iTV field in Germany. Now RTL's subsidiary, RTL New Media, is solely responsible for developing new formats for broadband PC, ITV and mobile Internet in Germany. As one of the largest content providers in the country, it is a major objective for RTL to distribute its contents across a wide range of platforms. over to MHP 1.0. Interactive services. RTL world is also offering games applications based on its quiz shows "Who Wants to be a Millionaire?" and "Quiz 21". No educational content has been mentioned. Media Vision's package did include a special interactive channel<sup>49</sup> users to rate new shows and t-commerce but this has now been discontinued.

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<sup>42</sup> Europe Online Web Site <http://www.europeonline.com/en/index.shtml>

<sup>43</sup> Europe Online Press Release "Europe Online and Datacargo Sign Cooperation Agreement for Video on Demand Services on Set-Top Boxes" Luxembourg, 17 February 2003 [http://www.europeonline.com/en/company/press\\_releases/datacargo.shtml](http://www.europeonline.com/en/company/press_releases/datacargo.shtml)

<sup>44</sup> Details of Fujitsu Siemens Advanced Set-top Boxes can be found at: - <http://www.fujitsu-siemens.com/rl/products/broadband/advancedsettopbox.html>

<sup>45</sup> Datacargo web site <http://www.datacargo.de> (in German)

<sup>46</sup> Waldmaier, Stefan (2001). *Glasfaser bis zum Kunden*. In: Finkschau 5/2001:50-52,52.

<sup>47</sup> Mühlbauer, Peter (2001). *Die Glasfaser in ihrem Lauf...hält DSL im Osten auf* [WWW-Dokument] <http://www.heise.de/tp/deutsch/inhalt/te/4885/l.html> [27/03/2002]

<sup>48</sup> Premiere (2002). *PREMIERE und Arcor Online planen gemeinsames Video-on-Demand-Angebot. Absichtserklärung für DSL-Pilotprojekt unterzeichnet*. [WWW-Dokument] <http://www.premiereworld.de/cgi-bin/WebObjects/PWPPortal.woa/8/wo/cyD9oG2GdC7m3FBVOeAluMsh2LN/10.0.8.3.3.0.3.1.0.0NMEdiWOContainerSlotNC.0.PWEdiWOOneRowTextTeaserNC.3.0> [22/03/2002]

<sup>49</sup> Media Vision. *Media Vision: Jetzt sind Sie am Drücker*. Corporate brochure

## Greece

Although there were some attempts to develop digital terrestrial broadcasting in 2000 this appears to have failed. However, there are two rival digital satellite services operated. Nova, the largest of these, made its debut in November 1999 and currently claims between 90-100,000 subscribers. Backed by Multichoice Hellas, which also operates an analogue pay-TV service with its sister company NetMed Hellas, it offers a wide variety of programming - including two pay-TV movie channels - and several interactive services. Alpha Digital, which made its debut in October 2001, has several investors including Interamerican Hellenic Life, Greece's largest insurance company, and Efstathios Tsotsoros, the chairman of Alpha TV. Like Nova, it offers its 35,000 subscribers a mix of programming, though with the emphasis is firmly on three quality sports channels<sup>50</sup>.

## Iceland

According to the digital broadcasting provider NovaMedia<sup>51</sup> Iceland is starting to rollout IP-based broadband TV. NovaMedia will deliver rich media services to Reykjavik's population of 200,000 households using the country's widespread fibre network to deliver an extensive live TV channels and video-on-demand (VOD) over an IP-based infrastructure. The pilot deployment began with existing Fibre-to-the-Home (FTTH) connections. It was planned to provide services to 20000 households by the third quarter of 2002. It also calls for expanding the channel line-up and adding additional services such as gaming, e-commerce, email, and TV-based Internet access as the installed base grows<sup>52</sup>. There is no indication that it will be used for learning services at present although it is highly likely that this will happen.

## Italy

The principal drive to digital television in Italy is satellite pay-TV, with little to no alternative to choose from and the TV market is currently at an early stage of development, with few interactive television applications available.

Italy has two digital satellite television operators: Stream and Tele+. A merger between the two companies has now been approved<sup>53</sup>. Together they reach 13% of the Italian population. Bi-directional satellite network offers interesting potential for the iTV sector and will be a factor in the future shaping of the Italian television market.

Italy's<sup>54</sup> cable television is almost non-existent and the wireless local loop solution has fallen behind the potential. In 2001 Telecom Italia's cable network reached the 0.08 million households figure<sup>55</sup>. Even though they are mainly

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<sup>50</sup> Source: Digital TV Group Web site [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

<sup>51</sup> Novamedia Web site <http://www.media.is/forsida.asp>

<sup>52</sup> Novamedia press release <http://www.media.is/news.asp?sida=pressreleases>

<sup>53</sup> Source: Itvt Issue 4.97 Part 2 | March 4, 2003

<sup>54</sup> Ministero delle Comunicazioni (2002). *L'infrastruttura di rete in Italia* [WWW-Document]. [http://www.comunicazioni.it/largabanda/\[11/03/02\]](http://www.comunicazioni.it/largabanda/[11/03/02])

<sup>55</sup> Commission of the European Communities (2001). *Seventh report on the implementation of the telecommunications regulatory package* [PDF-Document]

driven by the B2B sector, such as Wind's<sup>56</sup> fibre optic broadband supply to businesses.

DSL<sup>57</sup> in Italy covers 80% of the population. Telecom Italia outlined an aggressive investment plan. ADSL is already present in 800 Italian cities, and by the end of 2004, Telecom Italia is looking forward to extending the ADSL technology to more than 1,000 cities. Italy does not currently have interactive television services available through DSL technology.

In a few Italian cities, Fibre-to-the-home is linking households to a large bandwidth provision of telecommunications services and advanced interactive television applications. These developments are very interesting and could offer a lot of potential in the near future for learning developments.

In Northern Italy, FastWeb is providing fibre-optic links to the home with Internet speeds up to 10MB and offering customers TV-on demand. Where fibre-optic is not available to the home they can also offer ADSL at 2MB downstream and 0.5MB upstream.

A two-way video solution is already available and being used by 6000 subscribers in Northern Italy who have fibre-to-home. In October 2002 FastWeb, the e.Biscom Group's broadband telecommunications operator, announced the launch of its TV-based Videocommunication service. The application, which enables telephone users to see the person at the other end of the line on their TV screen, is available to all residential customers in Milan, Rome, Genoa, Turin, Naples and Bologna who have access to the FastWeb fiber-optic network. The solution makes large-scale use of fibre-optics, which support virtually unlimited bandwidth, with the Internet Protocol (IP), the universal communication protocol for integrated management of large volumes of voice, data and video traffic.

To use the TV-based Videocommunication service<sup>58</sup>, subscribers need a television set, a touch-tone telephone, preferably a cordless model, and a small FastWeb TVcam video camera placed on top of or next to the TV. The TVcam needs to be hooked up to the FastWeb connection, to the telephone jack and to the television set, via the scart socket. To make the video call, the user presses the asterisk key before keying the telephone number. The TVcam of the person being called rings. When the call is answered on the telephone linked to the TVcam, a normal voice conversation begins. If the that is person being called and wishes to be seen he or she presses the asterisk key, and the parties can see each other on their TV screen as they speak. If the person being called does not wish to be seen, he or she simply presses

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[http://www.liderdigital.com/documentos/Report-2001-Implementation-Regulatory-Package-\(anexos-3-4\).pdf](http://www.liderdigital.com/documentos/Report-2001-Implementation-Regulatory-Package-(anexos-3-4).pdf) [11/03/02]

<sup>56</sup> Ministero delle Comunicazioni (2002). *L'infrastruttura di rete in Italia* [WWW-Document]. [http://www.comunicazioni.it/largabanda/\[11/03/02\]](http://www.comunicazioni.it/largabanda/[11/03/02])

<sup>57</sup> Ministero delle Comunicazioni (2002). *L'infrastruttura di rete in Italia* [WWW-Document]. [http://www.comunicazioni.it/largabanda/\[11/03/02\]](http://www.comunicazioni.it/largabanda/[11/03/02])

<sup>58</sup> "FastWeb Presents the World's First TV-based Videocommunication Service" e.Biscom Press Release, Milan, 15 October 2002

the “0” key (“privacy” mode). In this case, the TV screen displays the caller, but not the person being called.

Video calls may also be made outside the FastWeb network to PCs with WebCams, video telephones or ISDN videoconferencing stations. Calls are charged at 0.25 euro per minute for video calls to FastWeb customers and a monthly rental fee of 11 Euros for the TVcam.

Apart from opening up new opportunities for person-to-person communication, Videocommunication can be used for a host of applications in the public sector. FastWeb technology supports audio/video links between remote government agencies, public bodies, schools and hospitals to permit significant enhancements in the quality of public services as well as improved cost-effectiveness. Possible applications include: tele-education and e-learning, with extra lessons from home, parent-teacher communication and links between geographically distant schools; tele-healthcare and e-health, for remote medical consultations, healthcare services and transmission of patient records, samples and X-rays without involving physical movement between sites; and for tele-working; tele-assistance for the elderly and disabled.

Digital Terrestrial TV was due to be allocated at the end of 2002. It is hoped that by 2006 30-40% of the entire Italian population will actually be able to receive it.

Italian telecommunications manufacturer Itelco is to conduct field trials of DVB-RCT, the first terrestrial-based standard that offers a wireless return path from the home back to the broadcasters and interactive content providers. DVB-RCT is a spectrum efficient, low cost, powerful and flexible multiple access system based upon OFDM/OFDMA technologies. The standard addresses the issue of interaction channel for interactive digital terrestrial television services, complimenting the DVB-T downstream specification, and was adopted by ETSI (The European Telecommunication Standard Institute) in last year.

The trials, which are due to officially start in September 2002 from its headquarters in Orvieto, will also serve to test mobile TV reception and the transmission of interactive TV services. Three TV transmitters have already been set up and pilot households are to be selected over the coming months. An estimated 200,000 has been earmarked for the trials. The RCT platform will enable services such as: Video on Demand (VOD), TV voting, TV browsing, video conferencing, interactive games and T-commerce. An interactive digital terrestrial television seminar was held February 4-5 at Itelcos Orvieto headquarters, organised together with Israeli OFDMA specialist Runcom, during which DVB-RCT (Return Channel Terrestrial) technology was demonstrated. Taking part were local authorities, representatives of the Umbria Region, national broadcasters RAI, Mediaset, La 7, Home Shopping Europe, as well as several regional TV networks. Besides illustrating the technological details of DVB-RCT, participants were treated to a live demonstration featuring broadband files transfer, web

browsing, Digital Video Broadcasting from the transmission site module to the end users, video conferencing, and even VoIP<sup>59</sup>.

Stream<sup>60</sup> offers some interactive services with its full range of programming. Tele+ interactive services are quite simple. RAI is committed on two fronts to interactive and digital television services. One is the broadband division called RaiClick and the other is the RaiSat satellite channels. Stream has an interactive language learning service on Stream in Italy.

RaiClick<sup>61</sup> is a partnership company between public service broadcaster RAI (60%) and e.Biscom (40%). It offers the very first *TV-on-demand* in Italy, a service allowing viewers to select programming at their own convenience. RaiClick's programming options come from the past and present content of the three national RAI channels: RaiUno, RaiDue and RaiTre. The service can be accessed both on the television and on the PC (as long as there is a broadband connection). The PC version gives access to a selection of more than 1,000 titles. The television version has a much richer archive and is updated daily with the content from RAI channels. While DSL is accessible nationwide for PC services, the television service is restricted to households with fibre optic connection.

## Ireland

Ireland can receive Sky Digital that is broadcast over both the UK and Ireland. So the same satellite-based interactive TV services are available in the UK for subscribers. The public service broadcaster RTÉ decided to put its two TV services on the Sky Digital platform from April 2002 - which probably resulted in Sky Digital being very successful in the Irish Republic, with over 200,000 subscribers. RTÉ's decision to go on Sky Digital has also been a severe blow to the two main Irish cable companies - Chorus and NTL, which are in the process of rolling out their own digital services. Irish language station TG4 is also planning to go on Sky Digital in 2002, and TV3, partly owned by Granada, is also in negotiations with the satellite broadcaster.

The Irish Regulator is now considering the UK "Freeview" model for Digital Terrestrial which might be launched during 2003. They are considering a digital TV project for Ireland modelled on Britain's Freeview service run by the BBC and BSkyB. If agreed the service would mean that customers can pay a once-off fee of approximately €160, with no further payments and would make RTÉ 1, Network 2 and TG4 freely available to viewers throughout Northern Ireland<sup>62</sup>.

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<sup>59</sup> "Interactive DTT standard trials to start in Italy" 14 February 2003 Digital TV Group  
[http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/\\_menu.html+reference/dtt\\_world/\\_dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/_menu.html+reference/dtt_world/_dtt_world_index.htm+World%20Watch)

<sup>60</sup> Stream TV (2002). *Chi siamo, la TV digitale*. <http://www.stream.it/chisiamo/tvdigitale>  
[12/03/02]

<sup>61</sup> Raiclick. Chi siamo. [WWW-Document] <http://www.raiclick.it/it/chi-siamo/home.htm>  
[11/03/02]

<sup>62</sup> Irish Times 7 February 2003 <http://www.ireland.com/newspaper/front/2003/0207/960113757HM1TELEVISION.html>

The Irish Telecoms Regulator, Eain Doyle is introducing new licencing regimes for fixed wireless access (FWA) to stimulate broadband rollout. One will provide a simplified system for local and regional licensing in the 10.5GHz band. A second initiative will involve additional spectrum being made available for licence-exempt W-LANs in the 5.8GHz band. Both of these initiatives are aimed at enabling fast and flexible rollout of wireless access to encourage increased availability of broadband services. Telecom operators will now be able to offer tailored localised services competitively<sup>63</sup>

### **Luxembourg**

Most households in Luxembourg have access to TV via analogue cable. Some households are likely to have access to “foreign” digital satellite broadcasters who may offer some interactive services.

### **Monaco**

Monaco Telecom is launching a six-month, 300 subscriber trial of an ADSL-based VOD service in partnership with telecom/broadband equipment provider, Alcatel, and content aggregator, Moviesystem. Branded as "SesameTV," the service, will be offered under the auspices of Monaco Telecom's subsidiary, MC Cable, and will employ Thomson's DSL 1500 set-top box, will provide viewers with three payment options. Viewers will be either able to purchase movies on a pay-per-view basis, pay 20 euros a month to watch 5 films, or pay 52 euros a month for access to all the service's titles. Around 400 French and international movies will be available, including new releases, library titles, and adult movies. The offerings will be refreshed on a monthly basis<sup>64</sup>.

### **Netherlands**

Digital TV developments remain very slow in The Netherlands. The slow pace of development in The Netherlands has been many due to the country having one of the highest cable penetration rates in Europe with about 30 channels broadcast.<sup>65</sup> There has tended to be little incentive to move to a digital platform purely for TV since its main advantage is more channels. Out of 6m households with cable TV there are now about 100,000 households with digital cable TV.

NCRV, The Dutch TV network appears to have started broadcasting a new series of its single-screen interactive quiz show, " Nationale Nieuwsquiz "(National Newsquiz) from 1 October 2002. The ITV elements invite viewers to answer questions, which test their knowledge of current and historical events. These services can be accessed by subscribers of the digital cable networks Casema, TV Home, and UPC<sup>66</sup>. An interactive TV National Science Quiz has also been developed by VPRO<sup>67</sup>.

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<sup>63</sup> New Licensing for Ireland's Broadband Roll-out ODTR 31 May 2002

<http://www.odtr.ie/docs/pres130700.doc>

<sup>64</sup> Itvt Issue 4.97 Part 2 | March 4, 2003

<sup>65</sup> "Development of Digital TV in The Netherlands 1998 Report", Lentic

<sup>66</sup> Source: Tracy Swedlow's InteractiveTV Today Issue 4.68 3 September 2002

<sup>67</sup> More information and other examples can be found at <http://web.omroep.nl/itv/> (in Dutch)



In the Eindhoven area of The Netherlands, as part of the “Kenniswijk Project”<sup>68</sup> 400 homes are being connected by fibre optic. This is the first stage of development. From April 2003 NOB – the Dutch distributor of TV services will be providing video-on-demand MPEG2 content via IP-based set-top boxes to the TV for initiatives like the Kenniswijk Project.

The Dutch municipality of Helmond and Imtech Telecom are looking into the possibilities of providing the town with a fibreglass network. This network would enable broadband Internet connections and could also to be used for receiving television signals and phone signals<sup>69</sup>. It appears that a recent report has suggested that all households in the city of Amsterdam should be connected to a public broadband network<sup>70</sup>.

As of January 2003 The Netherlands currently has an ADSL penetration of 4.8%. KPN Telecom are testing technology that would allow it to offer interactive TV, video on demand (VoD) and games to consumers along with its high-speed Internet service, but no mention has been made of learning services.

### **Norway**

Canal Digital - partially owned by Canal Plus and Telenor (the Norwegian telecom company) - started digital broadcasting via satellite to all the Nordic countries in October 1998. In July 1998 NRK (the public service broadcaster) came to an agreement with Canal Digital to be on the satellite and have a common electronic programme guide (EPG)<sup>71</sup>. NRK was investigating the possibilities of starting a digital channel for education and training in 1999 but there is no indication that this has actually happened.

Norwegian digital broadcasting specialist, Tandberg Television, is working with Cisco, on a VOD- enabled TV-over-IP deployment in Norway. The deployment, with Norwegian energy company, Lyse, combines Tandberg's iTTV platform and Cisco's Metro Ethernet broadband technologies, to enable a "triple play" offering of video, voice and data services via Ethernet-over-fiber. It is currently in a 500-household commercial trial that began this month. Customers pay 85 Euros a month for a service that includes 40 linear channels, VOD and an EPG. In addition to technologies from Tandberg and Cisco, the Lyse deployment uses set-top boxes from Swedish manufacturer, Kreatel, and VOD servers from BitBand<sup>72</sup>.

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<sup>68</sup> Kenniswijk Project web site <http://www.kenniswijk.nl/english/index.jsp?pageid=198695> (in English and Dutch)

<sup>69</sup> Source: Telecom.paper 10 June 2002

<sup>70</sup> Source: Felix van Rijn by email Mon 03/03/2003

<sup>71</sup> “Digital TV and public service in the Nordic countries” by Rolf Branderud, to appear as a contribution to the anthology “Television of the Future - or the Future of Television?” edited by Jens F. Jensen and Cathy Toscan

<sup>72</sup> “Tandberg Television Delivers TV Over IP for Italian and Norwegian Triple Play Operators” Press release date: 13 September, 2002  
<http://www.tandbergtv.com/press/showNews.asp?id=82>

## Portugal

TV Cabo is both the leading cable company and the only satellite television operator. TV Cabo Portugal, is a holding company of Telecom Portugal. It implemented the Interactiva<sup>73</sup> service in June 2001 in the Lisbon metropolitan area only. It is the world's most advanced broadband cable iTV service. The set-top boxes to access the 40 fully interactive Interactiva channels are powered by Microsoft TV Advanced and Microsoft TV Server. The box is devised to merge the iTV features and the convenience of Personal Video Recorder into one. According to Microsoft, more than half of the Interactiva subscribers are making use of interactive services every day. February 2002 saw the launch of the TV Cabo<sup>74</sup> video-on-demand service for broadband Internet subscribers-NetCabo.

Others include Cabovisão and Bragatel on the national level, and Lusomundo, Intercabo and Pluricanal on the local level. Until recently, the cable infrastructure was analogue, though an upgrade has begun to integrate co-axial and optical lines.

Cabovisao<sup>75</sup> is the second-largest cable network of Portugal. This bi-directional delivery platform is fully optical to the local node, enabling bandwidth capacity for video-on-demand and other digital services. Besides high-speed Internet access and cable telephony, Cabovisao also offers basic cable television and pay-TV to some hundred thousand customers. Cabovisao, a subsidy of the Canadian Cable Satisfaction International Inc. (Csii), is the provider of fixed alternative direct broadband communications and multimedia services in Portugal.

Cabovisao plans to exploit the real interactive television potential only in the future. The company owns its own fibre optic and coaxial cable and complementary television services<sup>76</sup> such as pay-per-view, video-on-demand, regional channels and interactive television projects are presently being conceptualised.

The public service provider RTP does not appear to have implemented any enhanced or interactive television initiatives, though it is predicted that with the advent of DTTV they will develop potential projects along the lines of digital television.

The Portuguese communications regulator has awarded the country's sole DTT licence, valid for 15 years, to Plataforma de Televisao Digital Portuguesa (PTDP), beating the bid from Oni Plataformas. The five-multiplex network will carry free-to-air simulcasts of the existing analogue national networks plus

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<sup>73</sup> Microsoft TV (01/10/2001). *Momentum Builds Worldwide for Interactive TV Services Powered by Microsoft TV Platform*. [WWW.Document]

<http://www.microsoft.com/TV/Press/News/10-01-momentum.asp> [15/04/02]

<sup>74</sup> Paulo Jorge Silva (2002). *TV Cabo launches video on demand*. [WWW.Document]

<http://www.europemedia.net/shownews.asp?ArticleID=8715> [15/04/02]

<sup>75</sup> Cable Satisfaction International Inc. (2001). *Broadband Network*. [WWW.Document]

<http://www.csii.ca/pages-eng/portugal/portugal.html>[13/03/02]

<sup>76</sup> Cabovisao. *Serviços*

*futuros*. [WWW.Document] <http://www.cabovisao.pt/Servicos/#>[13/03/02]

new programme and interactive services. The three national networks will use channels above channel 59; in addition, one multiplex is allocated for regional programming and one for local. The service was planned to be launched in April 2002. The licence requires coverage for national services to be 30% by the end of the first year, 60% at the end of the second year and 95% at the end of the fifth year. Analogue switch-off is planned in 2007<sup>77</sup>.

Portugal Telecom is the national incumbent carrier of telephone services and started implementing ADSL in 2001 in the Lisbon and Porto regions. National electricity company, Electricidade de Portugal<sup>78</sup> is the second national fixed-line carrier but there are no details of its plans.

## Spain

Spain has a population of about 40.6m with about 12.8m households. Digital television is offered in Spain by satellite (18.7%)<sup>79</sup>, cable (0.4%) and terrestrial (3.5%).

ADSL and FTTH (Fibre to the Home) delivery are not used in Spain for digital television transmissions. There have been initiatives from operators to install networks in some areas of the country. Prospective developments will depend on the market demand. Even in 2001, digital TV reached 22.5% of the country's households, making Spain the third most advanced market in Europe<sup>80</sup>.

Spain was one of the very first countries in Europe to invest in and launch digital services over the terrestrial network through Quiero TV. However, Quiero shut down at the end of April 2002, returning its licence to the government<sup>81</sup>. There were problems concerning the quality of the digital Terrestrial signal and the high price and lack of MHP set-top boxes. However, the new regulatory framework enables the local TV stations to apply for licences with their respective local authorities. Localia TV, owned by the Prisa Group<sup>82</sup>, is identified as one of the main players.

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<sup>77</sup> Source Digital TV Group [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

<sup>78</sup> Point.topic (25/09/01). *DSL Worldwide overview Portugal Telecom*. [WWW-Document] <http://www.point-topic.com/scripts/directory/profile.asp?company=47> [07/03/02]

<sup>79</sup> Bdrcltd and European Commission Directorate General Information Society (2001). *The Development of Broadband Access Platforms in Europe. Report*. [PDF-Document] <http://europa.eu.int/information-society/eeurope/news-library/new-documents/broadband/index-en.htm> [18/03/02]

<sup>80</sup> "European Interactive Television Report – Technologies, Application and Market Overview" published by Van Dusseldorp & Partners in August 2002, P.160

<sup>81</sup> Leslie Crawford & Joshua Levitt (25/04/02). *Quiero TV closed as the competition bites*. [WWW-Document] <http://news.ft.com/ft/gx.cgi/ftc?pagename=View&c=Article&cid=FT36FIU5HOD> [26/04/02]

<sup>82</sup> Prisa Group (22/04/02). *Localia estrena imagen corporativa, magazine nacional y espacio informativo*. [WWW-Document] <http://www.prisa.es/web/sections/view29.php?ID=576> [22/04/02]

Televisio de Catalunya (TVC) plans to offer 3 new MHP- based ITV applications as part of its ongoing digital terrestrial trials. The applications are an EPG magazine with info about programmes, a news ticker and a weather service, each has various interactive features and help pages. TVC has also collaborated with CCRTV, the Digital Television Department of Ramon Llull-La Salle University, and a third CBC subsidiary, Activa 3, to develop its own DVB-MHP ITV broadcasting platform, branded "FlowServer." <sup>83</sup>

The Cable Operators Association (AOC) is composed of 11 operators. AOC represents 80% of the cable market in Spain. The association<sup>84</sup> counts 250,000 subscriber homes and almost 2 million with the ability to receive cable. Ono is largest provider of integrated broadband services in Spain. This cable operator serves in 11 areas, including Levante, Albacete Capital, Hueiva. Cadia, Santamaria Port, Baleares y Cantabria. According to consulting firm Media Park <sup>85</sup>, Telefonica Cable doesn't seem to have a big interest in providing cable services; its plan is to provide broadband services via ADSL.

One of Spain's largest cable operators, Auna Telecomunicaciones, is to launch its first digital TV services this month through five of its six cable networks: Madrid-based Madritel, Menta, Able, Supercable and Med Telecom. The company will be marketing flat-rate interactive TV services to its 325,000 TV clients at a price of €6 per month. The offering will include an e-mail (or TV-mail) service, SMS messages, chat, interactive games and a service called Mirador Interactivo that will allow the subscriber to select and buy pay-per-view programming. New added-value services will be added in the future. AUNA's first steps towards digital pay-TV coincides with similar moves at ONO, the other largest operator, which will soon move with the digital tide. Both companies, which, combined, would have more than 1 million subscribers, are engaged in merger talks to counter the competition threat from the country's proposed merged satellite platform, and should discussions be successful, are likely to become the second largest digital pay-TV group in Spain<sup>86</sup>.

Telefonica<sup>87</sup> is developing its ADSL broadband network, and in 2005 plans to provide television content via ADSL in Spain. The project called Imagenio<sup>88</sup>, include 22 TV channels, a broadband Internet connection offer VOD services, at the present it is testing the service in Alicante. In October 2003 Spain's

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<sup>83</sup> Source: itvt 30 April 2002

<sup>84</sup> MediaPark (2001). *Situation Report: Panorama of Spanish Television*. MediaPark

<sup>85</sup> MediaPark (2001). *Situation Report: Panorama of Spanish Television*. MediaPark

<sup>86</sup> Source: Digital TV Group – 6 March 2003 [http://www.dtg.org.uk/news/world/-auna\\_digital\\_launch.htm](http://www.dtg.org.uk/news/world/-auna_digital_launch.htm)

<sup>87</sup> A.T./F.R.A. Las Gacetas de los Negocios (10/03/02). *Alierta no descarta la compra de Quiero TV pero si la de Recoletos*. [WWW-Document] <http://www.negocios.com/cgi-bin/show-newspl?fecha=20020309&seccion=empresas&orden=i0010>

<sup>88</sup> J.Montalvo and M.A. Patino (22/04/02) *Telefonica ofrecera TV por ADSL en 2003 para competir con el cable y el satillite* [WWW-Document] <http://www.expansiondirecto.com/edicion/noticia/0,2458,136652,00.html> [22/04/02]

ADSL Internet connections reached a total of 827,595 including the wholesale service lines<sup>89</sup>.

Some companies are starting to develop FTTH networks in Spain to implement iTV services later. This is the plan of cable operator Ono, which recently installed an optical cable network in the city of Valencia. Valencia is now the first Spanish city with an optical fibre network. The cable operator Ono started in <sup>90</sup> (March 2002) covering 384,000 households. iTV services in Valencia and by the end of 2002 planned to offer video-on-demand, tele-medicine. Auna Cable<sup>91</sup> will cover the entire Canarias archipelago with optical fibre by 2003 in three phases.

Canal Satellite Digital and Via Digital offer various interactive services but nothing specifically educational. Quiero TV started digital terrestrial broadcasting on May 5<sup>th</sup> 2000. Quiero TV offered a very extensive range of services to its 200,000 subscribers including some that can be defined as interactive services but nothing educational. Televisio de Catalunya, started in May 2002 but does not appear to have anything educational.

RTVE (Radio and Television Group) is the public service broadcaster in Spain. TVE has developed an interactive initiative combining SMS and teletext but nothing educational.

Half a million people in Spain subscribe to analogue cable TV services. More than 90% of the television cable in Spain is transmitting in analogue and is not offering interactive services. On the other hand, Madritel and Ono offer DTV over hybrid fibre coaxial (HFC) networks in some areas (pilot testing). So far, only Ono (CableEuropa) has committed to digital and interactive TV for the end of 2002.

### **Sweden**

Cable is the most popular way of viewing television in Sweden with a 50% market share. 35% of the population have analogue terrestrial with some 15% also taking DTH satellite.<sup>92</sup>

Digital Terrestrial TV (DTT) services were launched on 1st April 1999. However, there only appears to be about 100,000 households with set-top boxes, which resulted in commercial suppliers of services like Kunskaps TV (Knowledge TV) withdrawing. A 'relaunch' took place in April 2000 with an improved line-up of 18 channels; with new channels from the Modern Times Group including the popular entertainment channel TV5. A set top box rental scheme was also established through Boxer, a subsidiary of Swedish telecom operator Teracom.

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<sup>89</sup> Source: Telecom.paper.com 12 November 2002

<sup>90</sup> Asociacion de Internautas (02/03/02). *ONO culmina el cableado de Valencia con 41.000 kilometros de fibra optica*. [WWW-Document] <http://cable.internautas.org/article.php?sid=237> [12/04/02]

<sup>91</sup> Comunicaciones World (2002). *Auna Cable enlazara las Islas Canarias con cable submarino*. [WWW-Document] <http://www.idg.es/canal/ShowID.asp?ID=21590> [15/04/02]

<sup>92</sup> DigitalTV Group web site [http://www.dtg.org.uk/reference/dtt\\_world/dtt\\_sweden.htm](http://www.dtg.org.uk/reference/dtt_world/dtt_sweden.htm)

A new ITV service, branded SmarTV, was launched towards the end of 2002 to 1,500 households in Sollentuna, a suburb of Stockholm, Sweden. SmarTV plan to initially deliver video-on-demand movies, broadcast TV and Internet surfing via a broadband connection a broadband set-top box, supplied by Kreatel Communications AB. Services include hundreds of channels, on-demand movies and music; personalized TV schedule; e-mail and Internet access. Later, SmarTV will include a variety of e-shops, such as bookstores and even "e-pizza.") There are plans to make the service available to all Sollentuna's 22,000 households, and to roll it out on a nationwide basis in 2003<sup>93</sup>.

Swedish Utility company, PiteEnergi is extending their areas of business and becoming a communication operator for true broadband services. With the help of PacketFront's intelligent broadband solution and local "community initiatives", home owners – even in the far outskirts of the area - will be given access to very cost effective telephony, TV and Internet services.

The network that PiteEnergi is building consists primarily of single mode fibre to family home areas. The plan is to connect 4000 customers in four years. The network will also include the rural areas surrounding the city of Piteå – areas formerly considered non-lucrative in fibre broadband networks contexts. The secret of success contains of new and innovative business models and so called "community initiatives". The model builds on PacketFront's solution, that enables an operator independent network, and on the agreement that PiteEnergi will dig and blow fibre to the villages' borders, and the villages themselves will bring the fibre the last mile out to the homes<sup>94</sup>.

ViaEuropa, Sweden's leading communications operator, to provide an Operator Independent Network solution delivering broadband services to over 10,000 households in Hammarby Sjöstad, Stockholm – Sweden's largest broadband 'wired city'. This will allow the residents of Hammarby to receive video, TV, IP telephony and Internet services from competing service providers whilst remaining connected to a single physical network.

Hammarby Sjöstad, Stockholm, is Sweden's largest city construction project to date. When fully completed, no later than 2010, over 30,000 people will live and work in the area. The Hammarby project is also the first broadband network in Europe built to be 'Access Directive' compliant. Proposed by the EU, and due to be implemented in July 2003, this set of general conditions sets out the requirements that operators will need to meet in order to provide electronic communications networks and services under the new EU regulatory framework.

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<sup>93</sup> Source: SGI Technology

[http://www.sgi.com/newsroom/press\\_releases/2002/august/smar\\_tv.html](http://www.sgi.com/newsroom/press_releases/2002/august/smar_tv.html)

<sup>94</sup> PacketFront Press Release "PacketFront's technology and "community initiatives" bring true broadband to Piteå and surroundings" 29 January 2003

<http://www.packetfront.com/snews.php?id=3> Also see PacketFront website  
<http://www.packetfront.com/index.php>

ViaEuropa is acting as communication operator for the broadband network in Hammarby Sjöstad. It is responsible for securing a future-proof network and a full selection of attractive services. The initial service roll-out will offer local businesses and consumers Internet, IP telephony and TV services over the broadband network. Future applications will include online gaming, software services and storage on demand. The network will also offer extensive video conferencing capabilities<sup>95</sup>.

### **United Kingdom**

The UK leads the world in the development and uptake of digital TV through Digital satellite (BskyB), Digital terrestrial (formerly ITV Digital which used to be known as On-Digital) and Digital Cable (NTL and Telewest). The latest comparative figures<sup>96</sup> for the end of 2001 showed that 37% of UK households had digital TV compared to a European average of 16.3%. By contrast, only 8.2% of German households could watch digital TV. As of mid 2002 around 43% of British adults now have digital TV.<sup>97</sup>

There are a lot of complex reasons why digital TV is developing at different speeds across Europe. But it is beyond the scope of this study to go into detail about these reasons<sup>98</sup>.

As most households that subscribe to digital TV tend to use just one digital platform, this section has been categorised according to the different digital platforms that are available. (See diagram below). However, content providers are gradually starting to offer their interactive services across multiple platforms.

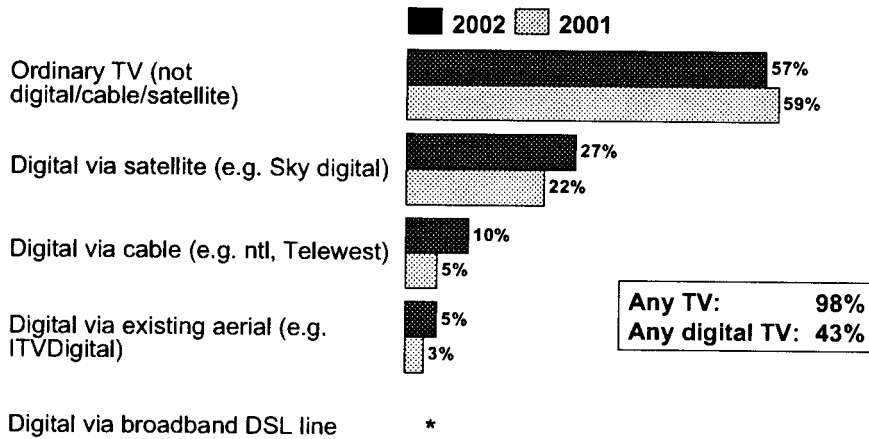
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<sup>95</sup> PacketFront Press Release "PacketFront's Intelligent Broadband Solution chosen for Sweden's largest "Wired City" <http://www.packetfront.com/snews.php?id=7>

<sup>96</sup> "UK dominates European Digital TV" Strategy Analytics Press Release 15 January 2002 <http://www.strategyanalytics.com/press/PRDM032.htm>

<sup>97</sup> Digital Television 2002 Mori survey for the UK Department of Culture, Media and Sport, May 2002 [http://www.digitaltelevision.gov.uk/pdfs/mori\\_2002\\_dtvsurvey.PDF](http://www.digitaltelevision.gov.uk/pdfs/mori_2002_dtvsurvey.PDF)

<sup>98</sup> The complexities of the development of the European market as it stood around 1999 are described in "Development of Satellite and Terrestrial Digital Broadcasting Systems and Services and Implications for Education and Training. Final Report", Bates, P.J. (1999). A study for DGXIII C3 Telematics Applications Program Education and Training Sector, European Commission published by pjb Associates, UK



Base: All respondents (2002: 1,053; 2001: 1,918)

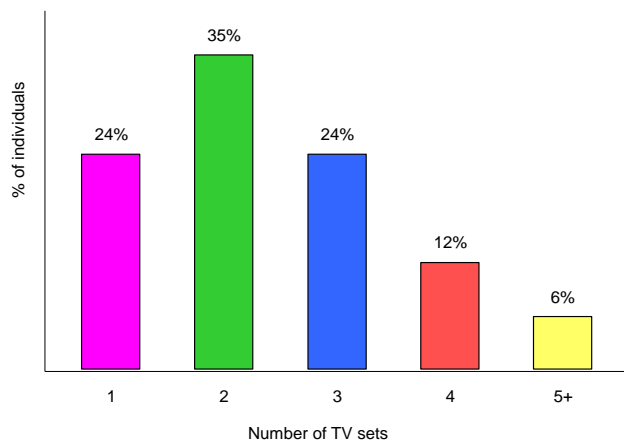
Source: MORI

### Types of Television in UK Homes 2002

According to a Mori survey conducted during April 2002 the social class of digital viewers in the UK is now in equal proportions between ABC1 and C2DEs compared to a slight bias towards C2DEs last year<sup>99</sup>.

It is worth noting that more than 40% of UK households have 3 or more TV sets. (See below). However, most digital TV offerings currently available only allow for one digital programme to be viewed in the home at the same time. This is because the set-top box that is required to connect analogue TV with the delivery service generally only has one digital tuner. This compares with analogue TV where the tuner in the TV set can be tuned to watch whatever analogue programmes are being broadcast.

### Number of television sets in the home



Base = All respondents  
Source: ITC, the Public's View 2001



<sup>99</sup> Digital Television 2002 Mori survey for the UK Department of Culture, Media and Sport, May 2002 Page 5 [http://www.digitaltelevision.gov.uk/pdfs/mori\\_2002\\_dtvsurvey.PDF](http://www.digitaltelevision.gov.uk/pdfs/mori_2002_dtvsurvey.PDF)



However, one survey<sup>100</sup> has found that in households with more than one TV an average of 1.42 TV can be used for watching digital TV – which does mean that some households must have more than one digital TV tuner.

### Digital Satellite

Most people who access digital satellite TV in the UK subscribe to Sky Digital's subscription service. This provides them with a satellite dish that is connected to a set-top box, which is connected to their existing analogue TV set. A few people have paid extra for the equipment and installation in order to just receive the free-to-air channels offered by the BBC, ITV and a few of the Sky and other channel providers. It is also possible to separately buy a satellite receiver and a digital set-top box and receive other free-to-air satellite channels available across the whole of Europe. This option tends to be a very niche market and is generally taken up by ethnic minority households who wish to receive programmes in other languages. Some interactive services are starting to become available.

### Sky Digital

Sky Digital is the only UK-based provider of digital satellite services and now has around 7m subscribers. It is primarily a broadcaster of channels – one-to-many – but does offer near video-on-demand and a wide variety of interactive services, in the form of enhanced TV like those mentioned above, on offer from the BBC and also through its independent Sky Active service. However the later does not appear to have any specific learning services.

Sky does have some plans for some sort of learning channel but details have yet to be announced.

Sky+, is Sky Digital's new fully-integrated Personal Television Recorder and satellite receiver capable of receiving two digital channels at once. It has the ability to record one satellite programme while watching another and includes the existing interactive and enhanced TV services such as email, banking, games, local information and home shopping. Sky+ uses a hard disk to record from the original broadcast stream, meaning all recordings will be the same digital quality as live viewing, and has an average of 20 hours worth of recording space. Sky claims that simplicity comes from the incredible ease of use of these features, primarily through full integration of the PTR functionality within Sky Guide, the on-screen electronic programme guide (EPG).<sup>101</sup>

### Digital Terrestrial

The World's first digital terrestrial service was launched in the UK in September 1998 with a subscription service known formerly as OnDigital and latterly as ITV Digital. However, after severe financial and other problems, the subscription service was closed down on 1 May 2002. Free-to-air services are still available to those who have an appropriate set-top box and the Independent Television Commission (ITC) has now awarded a conditional 12 year broadcasting licence to a consortium consisting of the BBC and Crown

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<sup>100</sup> BMRB Survey Jan 2002

<sup>101</sup> "Sky+ To Transform Television" Sky press release 18 July 2001 [http://www.corporate-ir.net/ireye/ir\\_site.zhtml?ticker=bsy.uk&script=410&layout=0&item\\_id=191933](http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=bsy.uk&script=410&layout=0&item_id=191933)

Castle (who own the transmitters) There is now free-to-view TV and interactive services<sup>102</sup> package called FreeView managed jointly by the BBC and BskyB.

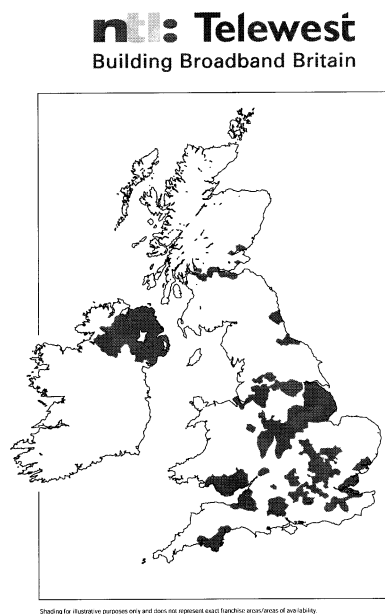
In order to access digital terrestrial services, a special set-top box is required. This is connected to an existing analogue TV set and an existing TV aerial. Digital signals are broadcast over the air in a similar way to existing analogue signals. However, UK coverage is only about 70% of the population, but this may change when new arrangements are in place.

Some of the free-to-air channels offer interactive services, particularly the BBC.

#### Digital Cable

There are now only two digital cable service providers in the UK – Telewest and NTL – both of which could be described as integrated communications providers – offering telephony, Internet access as well as cable TV services. This is known as the “triple play.” Both service providers offer cable TV services in different parts (franchises) of the UK – so do not really compete in this respect. It is possible that they may join together in the near future.

Digital cable is not available in many parts of the UK. Coverage is shown on the following map.



NTL offers a number of learning experiences as already described previously.

<sup>102</sup> “ITC announces decision on Digital Terrestrial Television” ITC press release 4 July 2002 [http://www.itc.org.uk/latest\\_news/press\\_releases/release.asp?release\\_id=610](http://www.itc.org.uk/latest_news/press_releases/release.asp?release_id=610)

### Personalised TV

As well as Sky Digital offering its Sky+ service, until January 2003 TiVo was also offering its service to those who bought a Personal Video Recorder (PVR). The TiVo service is still available to those who already have a PVR and continue their subscription to the service but the supplier of the PVRs Thompson is no longer manufacturing them and no other retailer appears to have entered the UK market.

It is also now possible to convert existing telephone lines into what is called a DSL format to provide broadband access to the Internet and access video-on-demand services. Video-on demand services are currently limited to a few areas of the UK.

### HomeChoice

Run by Video Networks “HomeChoice”<sup>103</sup> was launched in NW London in October 1999 using BT’s ADSL network. From September 2000, it was launched across London and now has around 12,000 subscribers. One of its offerings is “LearningChoice” a collection of educational programmes from the BBC and 4Learning. Learning features a variety of language courses, education for the under 5s and programmes on how to be a better parent<sup>104</sup>.

In September 2001, the company also launched a community TV-on-demand service in the London Borough of Newham in partnership with interactive TV company dktv<sup>105</sup>. It enables HomeChoice subscribers to make direct contact with the local council and access a wealth of information through their TV set. In addition it is now possible to access Learndirect information via the TV service<sup>106</sup>. Launched about April 2002, it is claimed to be London’s first interactive health information service. It offers instant on-demand visual advice and information about common illnesses and is available through a TV set to watch, pause, and rewind at any time<sup>107</sup>.

### Kingston Interactive TV

Kingston Interactive TV (KIT) is a DSL-based service, delivering 60 digital television channels, video-on-demand, TV Internet & Email, Home Shopping and Local Link- providing news/community information, including a weekday, news service from Yorkshire Television. Television channels are delivered at a rate of up to 4.5Mb/s to a standard TV set. Prices start from only £6 a month for a digital television package of 13 channels<sup>108</sup>. The set-top box rental is free of charge and customers can still watch KIT while making and receiving

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<sup>103</sup> Details from Video Networks web site <http://www.videonetworks.com/>

<sup>104</sup> “Video Networks Launches Education-On-Demand With New Learning Service” Video Networks press release 17 May 2001 <http://www.videonetworks.com/article23.html>

<sup>105</sup> “Video Networks Pioneers Broadband Britain Public Service Offering” Video Networks press release 3 September 2001 <http://www.videonetworks.com/article30.html>

<sup>106</sup> “Homechoice adds Learndirect to Groundbreaking Community Programming” Video Networks press release 6 November 2001 <http://www.videonetworks.com/article32.html>

<sup>107</sup> “Interactive Family Health Information Service To Be Available On TV” Video Networks press release 3 January 2002 <http://www.videonetworks.com/article73.html>

<sup>108</sup> “KIT announces video-on-demand relaunch with Yes Television deal” Yes Television Press release 30 July 2001 <http://www.yes.tv/newsroom/20010730.html>

telephone calls<sup>109 110</sup>. There are around 8300 subscribers available in Hull and parts of East Yorkshire.

NHS Direct Digital, a new digital television service from the Department of Health has been launched in Hull through KIT. The service provides viewers with interactive information about health that is also available on KIT. NHS Direct Digital provides customers with health information supported by dozens of videos, available on-demand to households - whenever they want it. The six-month pilot service offers KIT viewers information on first aid and healthy living and will include a database of local GP surgeries, pharmacies, hospitals and local blood donation sessions. The Department of Health has commissioned a total of four interactive digital television services in the UK, but the KIT service is the only one to be branded an NHS Direct service and offer true interactive and video-on-demand applications<sup>111</sup>.

KIT is also working with the BBC to take advantage of their video-on-demand service. For example, viewers in the Hull area can access the "Walking with Beasts" programme and the interactive components any time instead of waiting for the programme to be broadcast.

Viewers can also get information about their local schools through the local on demand service. Information can be regularly updated and can be viewed by parents any time of the day.

#### NTL and Telewest

The cable TV operators, NTL and Telewest, have signed up the pay-per-view specialist, On Demand Group, to develop a video-on-demand service<sup>112</sup> that is likely to be offered sometime during 2003.

#### Locally based initiatives

There are a number of very interesting locally based initiatives who are likely to be pioneers for future developments. These are described in more details in separate Appendix:-

- Appendix K Speke-Garston, Liverpool, UK Initiative
- Appendix L Carpenters Connect, Newham, London UK Initiative
- Appendix O Kingston upon Hull Area, Learning through Interactive Digital TV

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<sup>109</sup> from KIT web site <http://www.kit.tv/pc/aboutcompany.html>

<sup>110</sup> "Kingston Communications and the BBC team up to trial unique broadband service in Hull" Kingston Communications press release 10 October 2001 <http://www.kit.tv/pc/press.html#bbc>

<sup>111</sup> "Hull Residents Receive On-Demand Health Information Through KIT" Kingston Communications press release 30 November 2001 <http://www.kit.tv/pc/press.html#health>

<sup>112</sup> "NTL and Telewest to run video-on-demand" Guardian Unlimited 26 April 2001 <http://media.guardian.co.uk/broadcast/story/0,7493,478427,00.html>

## **Asia-Pacific**

### **Australia**

Australia has a population of 19.2m with 6.8m TV households. It has two state national analogue TV networks run by the ABC and SBS, together with three commercial networks (7, 9 and 10) which each have regional affiliates. There is also an analogue "Remote Area" satellite service, paid for by government, which also provides a subsidy of A\$500 (Euro294.64) on receiver boxes. Channel 9, run by media mogul Kerry Packer is the most successful of the three, followed by Channel 7 and Channel 10 respectively. The ethos is very much free-to-air supported by advertising, which to some extent explains the government's aversion to Pay TV.

Digital terrestrial television in Australia officially started on 1st January 2001 in each of the five major metropolitan markets; Sydney, Melbourne, Brisbane, Adelaide and Perth, with all five networks broadcasting their DVB digital services from high power transmitters. The country has also decided, in principle, to adopt MHP as its API.

Extension of digital to regional areas started in June 2001 with the most recent rollouts in Darwin, Hobart, and Canberra, and regional rollout estimated to be completed to most areas by 2004.

On the content side, the ABC has already produced two new digital channels - ABC Kids and Fly TV. ABC Kids is designed for preschoolers to age 12+ and Fly TV (<http://www.abc.net.au/fly/>) for viewers aged from their teens to early twenties. Kids airs between 6am and 6pm and Fly between 6pm and 6am. SBS is also planning to provide digital multichannel services this year.

By law the commercial operators are not allowed to multichannel, but they can provide multiview services (multiple angles of the one event, usually sports) and they have provided multiview coverage of PGA golf, cricket, motor-sport, horse-racing (the Melbourne Cup) and yachting (Sydney-Hobart race start) events to date. The Nine Network has also launched a digital program guide channel, and Network Ten has launched a HD demonstration channel during retail shopping hours so that consumers can see HD displayed in stores. Nine also provided enhanced coverage of the last Federal Election on its digital service.

Interactive TV is developing slowly among the big telcos and free-to-air broadcasters, as well as among small players assisted by funding from the Australian Film Commission's Interactive Digital Media branch. Austar, Orange on Ice, Easy Television, Optus, Telstra and the free-to-air networks are all developing services.<sup>113</sup> However there are some reports that OPTUS plan to discontinue their \$200 million interactive television project and turn to high-speed Internet services instead. The article states, "While many of the

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<sup>113</sup> Trends and Developments in the Australian Broadcasting Market  
Australian Broadcasting and Pay TV Market 2002 Report a BuddeComm Report

iTV offerings proved popular, the business model failed to work". The company wants to have a residential DSL service available mid-2003<sup>114</sup>. Austar has reached agreements with FOXTEL and Optus, subject to board approvals and any necessary regulatory consents, which will see Austar become a customer of FOXTEL's satellite platform and Austar and FOXTEL will cooperate in content creation. It will also ensure that Austar customers will obtain access to any new services FOXTEL develops, including near video on demand (NVOD), interactive TV services and new channels. It claims that agreements will ensure that regional and rural consumers have access to the best subscription television service available, equal to or superior to that offered in the major capital cities<sup>115</sup>. However, according to Gerry White CEO of education.au limited education interactive services are not on the radar<sup>116</sup>

Broadcast Australia, which owns the majority of Australia's TV towers, has announced trials of the new DVB-RCT digital TV technology that will allow digital TVs and digital set-top boxes a 'return path' for interactive services without need to plug into telephone lines. The TV aerial will instead provide the return path.

The Australian Broadcasting Authority (ABA) has released proposals for the conversion of the existing analogue TV services in the remote and regional areas of Western Australia, including Albany, Broome, Carnarvon, Central Agricultural, Esperance, Geraldton, Kalgoorlie, Manjimup, Narrogin, Northam, Port Hedland, Southern Agricultural and Wagin, to digital<sup>117</sup>. In addition the ABA has identified a further channel in each of the markets to be reserved for a third commercial digital TV service, as well as yet-unassigned channels in these areas that may be used for other purposes, including datacasting.

There are already 52MB connections to the home in the Canberra area of Australia. Australian interactive television pioneers Total Television Australia Limited (TTA) in March 2001 launched their television on demand service, Easy Television, which is being deployed over TransACT's broadband network. For \$50 per month, subscribers have access all Easy Television services, including movies on demand, music on demand, home shopping, broadcast pay TV, Internet on TV and email on TV. The service is currently available to about 3000 Canberra subscribers' although original plans to connect 100,000 homes by 2002, now appear to have been scaled down.

It is one of the largest IP based interactive television platforms in the world. TransACT's single cable is strung from the existing power poles, with optical fibre being taken to within 300 metres of each home or business, and in most cases much less. High quality copper cable has been connected over the last

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<sup>114</sup> Source: News.com.au

[http://www.news.com.au/common/story\\_page/0,4057,5809531^15306,00.html](http://www.news.com.au/common/story_page/0,4057,5809531^15306,00.html)

<sup>115</sup> Austar Press Release Austar's new arrangements to secure the future of digital TV in regional and rural Australia

<sup>116</sup> Source: email received from Gerry White 12 September 02 WWW:

<http://www.educationau.edu.au>

<sup>117</sup> "Remote Australia to get digital TV 18.11.2002" Digital TV Group [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

few metres giving each home or business a dedicated 52-megabit asymmetrical connection<sup>118119</sup>.

## China

China has a population of 1.25 billion with 310 million TV households. With a large proportion of the population living in apartment blocks, analogue cable television is very cheap and as many as 70 million Chinese subscribe at monthly rates as low as 12RMB (\$1.5). The State Administration of Radio, Film and Television of China, (SARFT) is planning to set up a national cable television network from the 750 local cable stations across China, as well as the proposed digital terrestrial services.

China has reservations about the lack of control in direct broadcast from satellite and plans are likely to centre on the digitisation of terrestrial transmission and cable, with satellite used for distribution over the vast distances between centres of population<sup>120</sup>.

It appears that China will soon unveil its own digital cable-television transmission standard, which has been developed with reference to Europe's DVB, or digital video broadcasting, system<sup>121</sup>. China is hoping to deploy a digital television broadcasting system by 2010, according to plans by the State Administration of Radio, Film and Television (SARFT), to replace the current analogue broadcasting system, which will be phased out by 2015, and 8 digital satellite TV channels be launched by 2005.

Regional DTT network trials are currently running in Beijing, Shanghai and Shenzhen of South China's Guangdong Province, with Shenzhen planning to make the digital television broadcasting service available to 10,000 households, whilst cable TV providers in Southwest China's Sichuan Province have also launched trials aimed at providing interactive TV programming for their 7 million subscribers.

A pilot scheme in Shanghai enables passengers on 17 buses to watch digital news, sport, stock exchange reports and commercials from 11 Shanghai TV stations, transmitted from the city's Oriental Pearl television transmitter site. The digital television broadcasting bus trials, sponsored by the Shanghai Broadcasting and Television Authority, are part of a larger project undertaken by Shanghai Media Group and Shanghai Oriental Pearl to test terrestrial TV transmissions.

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<sup>118</sup> "Easy Television to be launched in Australia" Yes Television press release 7 March 2001  
<http://www.yes.tv/newsroom/20010307.html>

<sup>119</sup> "Concurrent Computer and VOD Pty Ltd Take Video-On-Demand 'Down Under' with Australia's First Commercial Deployment" VOD Pty Ltd press release 27 June 2001  
<http://www.vod.net.au/outline.php3?dept=press&&id=8>

<sup>120</sup> "Digital TV introduced by 2010". Digital TV Group Web Site 1 October 2002  
[http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/\\_menu.html+reference/dtt\\_world/\\_dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/_menu.html+reference/dtt_world/_dtt_world_index.htm+World%20Watch)

<sup>121</sup> "Beijing near decision on digital TV standard Wu Zhong" 7March 2003  
[http://www.thestandard.com.hk/thestandard/news\\_detail\\_frame.cfm?articleid=37467&intcatid=2](http://www.thestandard.com.hk/thestandard/news_detail_frame.cfm?articleid=37467&intcatid=2)

However, the crucial problem for digital TV development in China is the choice of a transmission standard, and to this end the country organized a special committee of experts in 1999 to draw up its own digital broadcasting standards. Four domestic research institutions, including Tsinghua University and Shanghai Jiaotong University, submitted five HDTV transmission standards, and the committee, having already put these standards to test, will make the final decision on which scheme to choose by 2003<sup>122</sup>.

Wuhan SARFT plans to develop the Digital TV business within Wuhan City. At the moment Wuhan has the third biggest city network in China (according to Wuhan SARFT), with 1.16 million subscribers. Wuhan SARFT is establishing its digital TV network that consists of 10 DVB transport streams, to transmit 71 digital TV services aimed at the cable subscribers in Wuhan. The digital services will include NVOD, IP broadcasting with approximately 20 services for both music and multimedia programmes; thirteen distance learning services<sup>123</sup>.

Chongqing Broadcast and TV Network Transmission Co Ltd, a cable television provider for China's fourth largest city and China's largest single hybrid fiber-coax (HFC) network, with 3.5 million subscribers, is to launch digital and interactive TV services<sup>124</sup>.

Guizhou Tianguang Cable Network Co. Ltd has plans to roll out digital cable TV in Guizhou. Guizhou Cable TV will include around 70 channels with basic and premium tiers and has plans to offer interactive TV services. It will also be able to carry the interactive programming of CCTV, China's national broadcaster, such as CCTV 5i interactive sports programming<sup>125</sup>.

As broadband service providers continue to drop their prices, one third of homes in Hong Kong have signed up for broadband access. The government's Office of the Telecommunications Authority (OfTa) said that by the end of January 596,000 homes had broadband access, defined as one megabit per second or above. There has been a 60 per cent increase in broadband users compared to the same figure last year and there has been an access prices drop from to \$38 to \$26 in the last year, according to observers<sup>126</sup>.

In China's Hong Kong region, in February 2002, Yes Television had a commercial trial that blends together premium broadcast television with true video on demand (VOD), Internet access and email in a single integrated

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<sup>122</sup> Digital TV Group Web Site [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

<sup>123</sup> NDS Press Release January 2003

<sup>124</sup> "Chongqing Cable to deliver digital TV with NDS Technology", NDS Press Release 30 January 2003

<sup>125</sup> NDS Press Release 28 January 2003

<sup>126</sup> "Hong Kong broadband prices drop" Source Advanced Television.com <http://www.advanced-television.com/pages/pagesb/newsarchive2/april15-22html.html#hkband> April 2002



package of digital television services. This is in conjunction with STAR, a wholly owned subsidiary of News Corporation<sup>127</sup>

China Data Broadcasting Network will broadcast content from Beijing over a state-owned fibre optic network with a view to attracting one million users by 2005. Its parent company, China Cable Network, is 75 percent owned by SARFT, which sees it as a tool in its cable operator unification plans. The idea is that cable operators can tap into a single source of content, rather than relying on their own satellite dish farms to access programming.

Observers have also pointed out that the move reflects the government's desire to offer a single source of programming that can be easily controlled at source, rather than giving the operators a choice about what they carry. It will also position the cable sector to be an ISP once China relaxes its laws to remove the monopoly of Internet provision currently enjoyed by the fixed line telecommunications companies.

Beijing is also continuing to digitise its TV networks and cable operations and offer interactive services. SARFT has set itself a target of converting 30 percent of cable viewers to the technology by 2007. Although the target is ambitious, it is based on the fact that 12 large-scale provincial cable networks reach 70 percent of viewers. Presumably, these technical upgrades will also make it harder for members of the banned Falun Gong movement from hijacking cable, satellite and terrestrial transmissions as they have done repeatedly in 2002, to the intense anger and embarrassment of the Chinese authorities<sup>128</sup>.

## Japan

Japan has a population of 127m and 47.5 million TV households.

Despite the effects of the long-term economic downturn within Japan, and the seeming inability of successive governments to deal with the fundamental structural conditions that exacerbate its financial weaknesses, the pay TV industry remains amongst the most robust in the region. As long as they have sufficient interest and budget, Japanese viewers can view around 200 channels delivered by cable, direct-to-home satellite or terrestrial in analogue, digital and high definition (HDTV)<sup>129</sup>.

The direct-to-home satellite service SkyPerfecTV now has a rival in the direct-to-home market, Plat-One, which is delivered over the digital communications satellite CS110 and began transmissions in March 2002. It plans to use entertainment, movies and sports to garner viewers in a mixture of pay-per-view and premium tier offerings. The satellite also has advanced interactive functionality. SkyPerfecTV2, a sister service, on the same CS110 satellite in 2003 and will also offer interactive services.

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<sup>127</sup> "Yes Television Carries STAR Channels On Commercial Trial in Hong Kong" 14 January 2002 <http://www.yes.tv/newsroom/20020114.html>

<sup>128</sup> Pay TV in the Year 2002: Time for a reality check? P23 December 2002 Commission by Bloomberg Television

<sup>129</sup> Pay TV in the Year 2002: Time for a reality check? P15 December 2002

The shareholders in the Plat-One venture, Mitsubishi Corporation, Nippon TV Network and the WOWOW direct-to-home platform, will roll out a 46-channel platform that will cost an average subscriber \$32 a month (adding sign up fees, subscription fees and pay-per-view costs together). This is about the same as SkyPerfectTV's average tariff, although the latter can offer a total of 300 channels. Plat-One is counting on consumers realising that a TV set that can access its service, is also compatible with digital broadcast satellite and digital terrestrial transmissions that gives them access to services from the government-funded NHK, WOWOW as well as the major terrestrials. The company expects to attract one million subscribers by 2005, and three million by 2010.

Japan, like many developed markets, is currently attempting to switch TV transmissions from analogue to digital. The current thinking is to allow simultaneous transmissions from 2007 to 2011, although the switch will start in 2003 in selected large urban conurbations. The Ministry of Posts and Telecommunications will introduce the change to the rest of the nation in 2007<sup>130</sup>. Unlike some other governments, Japan is investing heavily in order to make the change as seamless as possible, allocating \$1.5 billion for the process. The cost of implementing the changeover has already been reflected in WOWOW's finances. The company, has 2.59 million subscribers.

On the cable TV side of Japan's multichannel sector, Jupiter Telecommunications has consolidated its position as the largest operator in Japan with 1.37 million subscribers, representing 30 percent of the residential cable TV market. Jupiter offers broadband Internet access over cable as well as voice and data. It increased and owns most of the high-speed cable Internet provider @Home Japan.

Japan has also begun trailing a jumbo 12Mbps ADSL service, which it hopes to roll out in summer 2003. Matsushita and NEC are becoming bedfellows with KDDI and Japan Telecom in the so-called Mega Consortium, which aims to promote broadband content and communications services in the country. An additional 27 firms make up the grouping, among them ADSL outfit eAccess, games developer Taito and Tokyo Electric Power, which is working on fiber-to-the-home (FTTH) solutions. The four founding members of the consortium own a collection of access providers and boast millions of Internet subscribers between them.

In early July 2002, Yahoo! Japan – backed by Softbank and BB Technology – began trialing a 12Mbps offering via its broadband access service, Yahoo! BB. Softbank Broadmedia, the broadband arm of Japanese venture capital/holding company, Softbank, plans to roll out an ITV-over-DSL service in Japan, The service, branded "BB Cable TV," will include 13 linear channels, VOD with PVR capabilities The service will be available to customers of Softbank's Yahoo! BB ADSL offering launched in September 2001 in a number of major Japanese cities: roll-out will begin in Tokyo in the fall, in

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<sup>130</sup> Pay TV in the Year 2002: Time for a reality check? P16 December 2002

Saitama, Chiba and Yokohama in December 2002, and in Sapporo, Nagoya, Kyoto, Osaka, Kobe and Fukuoka March 2003. Softbank hopes to eventually offer the service to all 885,000 Yahoo! BB ADSL subscribers (though inherent distance limitations of DSL technology may mean that not all subscribers' connections will be fast enough to support it)<sup>131</sup>.

Japan's Ministry of Public Management, Home Affairs, Posts and Telecommunications has begun relocating analogue terrestrial channels in certain regions to make way for the delayed launch of digital services to 2.11 million households in Tokyo, Osaka and Nagoya metropolitan areas in December 2002.<sup>132</sup>

The Japanese Government plans to spend around 180 billion yen (€1.4 billion) over the next six years on the shift from analogue to digital, which will include retuning 4.26 million households nationwide due to the frequency changes, and a major advertising campaign. Analogue switch-off is scheduled for 2011.

The Japanese Ministry of Posts and Telecommunications (MPT) has been funding research into digital broadcasting for several years and the NHK Science and Technical Research Laboratories has developed a unique variant of the DVB-T system. The ISDB (Integrated Services Digital Broadcasting) system segments the elemental OFDM carriers into groups, which can be transmitted with independent OFDM modes. Thus, a single transmission can service a robust mobile application and a higher data rate fixed reception application at the same time. Also, the DVB-T family of transmission modes has been extended by the option to include time interleaving. State satellite broadcasting will also switch to digital transmission in the over the next few using the ISDB-S system (it is not clear how that differs from DVB-T).

### **Singapore**

Singapore has a population: 3.5 million and TV households: 1.1 million are 340,000Cable/satellite homes but it is unclear whether this are digital or analogue.

Singapore's second-ranked telecommunications provider StarHub, and Singapore Cable Vision (SCV), the monopoly cable TV operator merged in May 2002<sup>133</sup>. StarHub, as the new company is called, can offer subscribers high-speed Internet access, cableTV and telephony on a single bill with discounts for taking a multiplicity of services. The cable TV operation may now become a telecommunications provider and StarHub can make use of the island-wide distribution system created by SCV over Singapore Telecom's

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<sup>131</sup> "Softbank Broadmedia Plans ITV-over-DSL Service in Japan " Source: Tracy Swedlow's InteractiveTV Today Issue 4.71 September 16, 2002 (Part 1)

<sup>132</sup> "Japan begins clearing analogue for digital TV" 13 February 2003 Digital TV Group [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/ menu.html+reference/dtt\\_world/ dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/ menu.html+reference/dtt_world/ dtt_world_index.htm+World%20Watch)

<sup>133</sup> Pay TV in the Year 2002: Time for a reality check? Commissioned by Bloomberg Television P28.

network. StarHub has also said that it will be able to share subscriber management and use cross-promotional tools to reduce costs and build market share. StarHub Cable TV, the new name of the former SCV, was set to end 2002 with 345,000 subscribers to its platform, with 85,000 of these also taking high-speed Internet access.

According to a report in 2002 on Broadband usage in Singapore, about one-in-three or 950,000 Singapore residents aged 10 years and above now use broadband to access the Internet. The number of broadband service providers has also grown from two to 12 since the launch of Singapore ONE in 1998<sup>134</sup>.

There appear to be only trials concerning the use of interactive television. Nothing has been launched yet<sup>135</sup>.

MediaCorp – One of the two public broadcasters, MediaCorp will be using DVB-T to deliver digital signals. It seems that they are facing stiff competition probably because of MediaWorks' (its rival) entry to the market. Maybe that's one of the factors (others may be regulatory, right timing, etc) for the hold back. MediaWorks has not announced any iTV plans but has been using SMS (Short Messaging) for 'live' interactions<sup>136</sup>.

Singapore Telecommunications (SingTel) – This telecommunication carrier is looking at providing interactive services via its ADSL network. They are applying for pay TV operator licence from the government and are very interested in the S\$200 million market (Business Times – 28 June 2002). Read from the same source (BT – 28 June 2002) that they have conducted a trial with 300 households (Q3 2001) enabling VOD, Internet access and emails. Sources that it has not very successful as there are low take up rates (BT – 28 June 2002). SingTel said it's only a feasibility study. There was a report that the 2<sup>nd</sup> pay TV licence may be awarded in mid 2003. SingTel is planning to rollout this service by year end and besides VOD, internet and email, etc, they are planning to include "normal" FTA channels. According to SingTel's spokesperson, it is unclear whether the government, IDA, will require them to obtain a Pay TV licence.

### **South Korea**

South Korea is the world's leader in broadband Internet services with over 6.25 million subscribers. Around 70% of online Korean households are connected to the broadband Internet services. Besides xDSL and cable access, Korean end- users are offered various alternative access modes, including wireless and satellite services, which are gaining popularity in

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<sup>134</sup> Source: Blue Sphere Interactive Report  
[http://202.157.129.12/ida/fastrack/html/archives/newsletter/20020722\\_surveys.html](http://202.157.129.12/ida/fastrack/html/archives/newsletter/20020722_surveys.html) see and see project website  
<http://www.ida.gov.sg/Website/IDACContent.nsf/dd1521f1e79ecf3bc825682f0045a340/48d28632a1bc733a48256b9d0010e472?OpenDocument>

<sup>135</sup> Source Fred Yeo mail [fred\_yeo@hotmail.com] In broadbandbananas discussion group iTV In Singapore & Taiwan 21/01/2003

<sup>136</sup> Digital TV Group [http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame\\_it.pl?reference/menu.html+reference/dtt\\_world/dtt\\_world\\_index.htm+World%20Watch](http://www.dtg.org.uk/cgi-bin/www.dtg.org.uk/frame_it.pl?reference/menu.html+reference/dtt_world/dtt_world_index.htm+World%20Watch)

selected and remote areas<sup>137</sup>. Video-on-demand type services are also developing. And, in July 2001 a new initiative was announced to provide 85% of homes with access to 20Mbit/s Internet access by 2005, at an estimated cost of approximately GBP10bn<sup>138</sup>.

But what distinguishes Korea from other markets, and may provide hope for media businesses worldwide, is the range of fee-based entertainment offerings already in place -- even if they have yet to produce substantial revenue. The three dominant broadband content portals -- DreamX.net<sup>139</sup> Korea Thrunet<sup>140</sup> and Hanaro Hananet<sup>141</sup> - offer everything from local and foreign films to pop music videos, educational programs, and online games. Each, through a relationship with all the major motion picture distributors, offers full-length feature films over video on demand (VOD) for \$2 to \$3 at a time.

All three major broadcasters -- Korea Broadcasting, Seoul Broadcasting, and Munhwa Broadcasting -- post their programming on the Web for VOD as well as streaming live broadcasts.

However, there does not appear to be much evidence of any learning services being made available.

There are also reports that The Content Company, will be providing an ITV-enabled IPTV service in Korea. The service, which will be targeted at residents of large apartment buildings (over the past decade, the Korean government has embarked on a program to wire multi-dwelling units with high-bandwidth fibre) and which the companies say will be available to millions of potential customers, will offer VOD at launch, and, at a later stage, PVR, interactive gaming and other ITV features<sup>142</sup>.

## **Africa**

MultiChoice Africa (MCA) has expanded its full return path based iTV services to most subscribers. TV-Mail, TV-Shopping and a new DStv Guide are now on offer to the general public. MCA CEO Nolo Letele said, "Interactive television, which is an integral part of our digital satellite broadcasting business, heralds a new era in broadcasting<sup>143</sup>. As of August 2002 Multichoice has signed up between 4 000 and 5 000 users for its interactive television offering in the last six weeks<sup>144</sup>

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<sup>137</sup> "The Korean Broadband Success Story" – Market Study September 2001

<http://www.igigroup.com/st/pages/koreanbroad.html>

<sup>138</sup> "The Broadband Stakeholder Group Report and Strategic Recommendations November 2001

<sup>139</sup> <http://www.dreamx.net>

<sup>140</sup> <http://english.thrunet.com>

<sup>141</sup> <http://www.hananet.net>

<sup>142</sup> Source: Tracy Swedlow's InteractiveTV Today Issue 4.71 September 16, 2002 (Part 1)

<sup>143</sup> Source: MultiChoice Africa <http://www.multichoice.co.za/home/default.asp>

<sup>144</sup> Reported by ITWeb, <http://www.itweb.co.za> Trickle-feed approach for iTV <http://c.moreover.com/click/here.pl?e45065540&e=6324> Sunday Times South Africa

TVAfrica has launched a more traditional daily interactive educational programme, via satellite called The Learning Channel. It will be presented as part of K Club -TVAfrica's children's section. With the presenter answering questions live on air from children in their classrooms as they phone in from Uganda, Malawi, Tanzania, Rwanda and Botswana<sup>145</sup>.

## **North America**

### **Canada**

In Canada, according to a Yankee Group Report<sup>146</sup> “the focus to date has been on Web access and Web-related services such as e-mail using the TV as the appliance”. However, the focus is shifting “toward the integration of video-on-demand (VOD), digital video recorders, and Internet-based functionalities”. It is also claimed that Canada has the second highest penetration of broadband in the World with 16% of households actually accessing broadband and even in the year 2000 70% of households were capable of accessing broadband<sup>147</sup>.

Leading ISP in Canada, Aliant Telecom is investing Cndn\$85 million in its broadband network across Atlantic Canada. This upgrade is being undertaken in preparation for a DSL-based ITV/VOD service the company is planning to roll out in a few months using middleware from IP ITV software developer<sup>148</sup>

Also, in September 2002 Shaw Cable began the commercial deployment of Video-on-Demand ("VOD") service in Calgary. Shaw Internet customers who also have digital cable service are able to access a broad range of programming content through their High-Speed or Lite-Speed Internet connection and digital set-top box. The VOD service enables customers to select programming from a library of titles through an online ordering system and view the programming on their television at a time of their choosing with full VCR/DVD functionality including pause, rewind and fast forward using their remote control. For a period of up to 48 hours, viewers can watch a program at their convenience and as many times as they want. Over the following 6 to 8 months, they had plans that the VOD service will be rolled out to virtually all of Shaw's digital and Internet customers in Western Canada<sup>149</sup>.

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<sup>145</sup> <http://www.biz-community.com/Article/196/15/596.shtml> 20 May 2002

<sup>146</sup> “Interactivity Brings New Life to Television, According to New Yankee Group Report” Yankee News Release 24 April 2002  
[http://www.yankeegroup.com/public/news\\_releases/news\\_release\\_detail.jsp?ID=PressReleases/news\\_apr242002\\_cms.htm](http://www.yankeegroup.com/public/news_releases/news_release_detail.jsp?ID=PressReleases/news_apr242002_cms.htm)

<sup>147</sup> “Why "Big North" is Primed for Success in Broadband - Why is Canada considered a successful case study for broadband access deployment around the world?” Case study on Alcatel web site <http://www.cid.alcatel.com/doctypes/leadstory/html/bignorthbroadband.jhtml>

<sup>148</sup> Aliant Telecom Announces \$85 Million Investment in Broadband Network Aliant Press Release Tuesday, June 18, 2002  
<http://www.aliant.ca/english/news/news2.asp?YYYY=2002&currentPage=2&Keyword=&BU1=&BU2=&BU3=&BU4=&BU5=&BU6=&BU7=&BU8=&FromDay=1&FromMonth=1&FromYear=2002&ToDay=10&ToMonth=8&ToYear=2002&id=762&frompage=news>

<sup>149</sup> Shaw Cable Launches Video-on-Demand Service combines Shaw Digital and High-Speed Internet in a unique offering Calgary, Alberta, June 20, 2002 Source:  
<http://www.shaw.ca/Tmplt2.asp?PageID=566>

Canadian telco, Saskatchewan Communications (SaskTel) also plans to offer an IP-based interactiveTV service over DSL during by end of 2002

Canadian digital satellite operator Bell ExpressVu was due to launch an enhanced set-top with PVR (Personal Video Recorder) in September 2002. The PVR will have full VCR functions and be able to store 30 hours of programming on a 40-gigabyte hard drive. It will be fitted with an advanced programming guide that will allow subscribers to scan programming by theme.

The fastest growing Internet connection type in Canada is high-speed access. Some 50% percent of Canadians use broadband for home Internet connections, compared with 21% of Americans and 5% of Europeans. Broadband take-up in Canada has doubled since 2000, with both cable modems and DSL popular. By early 2002 there were 1.6 million cable modem subscribers compared with 1.2 million subscribers using DSL.

Canadian TV penetration is 99%, including one of the world's highest cable penetration rates and one of the highest cable television take-up rates, with nearly 9 million subscribers (analogue and digital) out of 11 million homes passed. With extensive remote and rural populations, Canada has a large market for Direct-to-Homes (DTH) satellite television, with around 2 million satellite and MDS subscribers. Satellite broadcasters have begun exploring urban communities as potential markets in which to compete with existing cable companies.

TV broadcasting in Canada is competitive, regulated and rapidly evolving, as new technologies and the structural convergence of content and carriage transform underlying industry frameworks. Digital TV was launched in 2001, when the CRTC approved 283 licences for digital channels. The first sixteen of these were launched in September 2001. Transition to a digital environment continues, with both satellite and cable companies offering services. The market for interactive TV services appears to be starting strongly. Digital Terrestrial Television (DTT) is yet to make an impact, reflecting cost and viability issues. Competing distribution systems based on cable, terrestrial and satellite technologies strive to protect and strengthen their competitive positions in light of new digital platforms able to deliver more channels, better quality and a range of emerging interactive, new media services<sup>150</sup>.

By mid 2002 there were around 3.1 digital TV subscribers to both satellite and cable. Decima Publishing were predicting that they would be 60 percent for satellite TV and 38 percent for cable at the end of 2002, and 58 percent satellite TV and 40 percent cable at the end of 2003. They say "The Canadian broadcast distribution industry is now firmly in transition from analogue to digital and the competition is intense"<sup>151</sup>.

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<sup>150</sup> "Canada – Telecommunications – Market Analysis – 2002" Source:

<http://www.budde.com.au/Canada.html>

<sup>151</sup> Decima Publishing <http://www.decima.ca>

## USA

Federal Communications Commission (FCC)'s ninth annual report<sup>152</sup> on competition in the market for the delivery of video programming provides a useful basis for understanding the US market up to mid 2002. A total of 89.9 million households subscribe to multichannel video programming services (MVPD). This would be mainly through analogue TV with a few through digital services. 76.5 percent of MVPD subscribers received their video programming from a franchised cable operator. Direct Broadcasting satellite (DBS) subscribers represented 20.3%

Although it is difficult to get clear figures the vast majority of MVPD appear to be analogue rather than digital services although some digital satellite services are likely to be broadcast. The situation is also confused as when digital television (DTV) is mentioned it usually means digital terrestrial services which broadcasters are now obliged to transmit but hardly anyone accesses them. Only a very small number of MVPD appear to be in a digital format. As the US already has a large number of TV channels the incentive to switch to digital is order to get high definition pictures (HDTV) and the FCC has recently stated that all new TV sets must have a digital tuner.

The Telecommunications Act of 1996 ("1996 Act") removed barriers to telephone company or local exchange carrier ("LEC") entry into the video marketplace to facilitate competition between incumbent cable operators and telephone companies. At the time of the 1996 Act, it was expected that LECs would compete in the video delivery market and that cable operators would provide local telephone exchange service. The FCC previously reported that the four largest incumbent local exchange carriers ("ILECs") have largely exited the video business. This remains true today. A few smaller LECs continue to offer, or are preparing to offer, MVPD service over existing telephone lines. Alternatively, several cable multiple system operators ("MSOs") continue to offer telephone service. Cable operators are beginning to deploy Internet Protocol ("IP") telephony in addition to circuit-switched telephony offerings. Cable operators such as Cox and AT&T, continue to deploy circuit-switched cable telephony. Others, like Cablevision and Comcast, continue to offer cable telephony where it has already been deployed, but generally are waiting for IP technology to become widely available before accelerating their rollout of telephone service. AT&T, AOL Time Warner, Comcast, Cox, and Charter are currently offering or continuing to test IP telephony products<sup>153</sup>.

Cable operators continue to build-out the broadband infrastructure that permits them to offer high-speed Internet access. The most popular way to access the Internet over cable is still through the use of a cable modem and personal computer, though a small number of users continue to access the

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<sup>152</sup> FCC Press Release "Ninth Annual report on Competition in Video Markets" 31 December 2002 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-229984A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-229984A1.pdf)

<sup>153</sup> FCC Press Release "Ninth Annual report on Competition in Video Markets" 31 December 2002 Page 4 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-229984A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-229984A1.pdf)



Internet through their television and a specially designed set-top box, rather than a personal computer<sup>154</sup>.

Broadband service providers appear to be starting to compete with existing cable systems using state-of-the-art systems that offer a bundle of telecommunications services, including video, voice, and high-speed Internet access. RCN is the largest BSP, serving approximately 507,000 subscribers. WideOpenWest (“WOW”) is the second largest BSP with cable systems serving about 313,000 subscribers. The third largest BSP is Knology, which currently serves approximately 120,000 subscribers.

Another potential competitor for cable companies are several electric and gas utilities who continue to move forward with ventures involving multichannel video programming distribution. Some of their characteristics, such as ownership of fiber optic networks and access to public rights-of-way, make them competitively significant. Some utilities offer telecommunications services on their own, while others partner with broadband service providers, such as Starpower, RCN’s joint venture with PEPCO. It also appears that utilities, particularly municipal utilities in rural areas, are willing to build advanced telecommunications networks to offer a full range of services where incumbent cable operators and telephone companies are not. Reports indicate that 450 public power systems offer communications services, up from 357 offering service last year.

Currently, the wireless cable industry (“MMDS”) provides competition to the cable industry in limited areas. MMDS subscriptions declined between June 2001 and June 2002 from approximately 700,000 subscribers to 490,000 subscribers. With the advent of digital MMDS and the FCC’s authorization of two-way MMDS service, it appears that most MMDS spectrum eventually will be used to provide high-speed data services. Wireless cable represented an approximately 0.6 percent share of the national MVPD market in June 2002<sup>155</sup>.

As of June 2002, an estimated 54 million Americans subscribed to an Internet access service, compared with 50 million as of June 2001. Real-time and downloadable video accessible over the Internet continues to become more widely available and the amount of content also is increasing. Despite the evidence of increased interest in Internet video deployment and use, the medium is still not seen as a direct competitor to traditional video service.

The newest home video technology is the personal video recorder (“PVR”). One source reports that one million homes currently have PVRs. Three companies offering PVR services TiVo<sup>156</sup>, Ultimate TV<sup>157</sup> and ReplayTV<sup>158</sup>

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<sup>154</sup> FCC Press Release “Ninth Annual report on Competition in Video Markets” 31 December 2002 Page 4 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-229984A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-229984A1.pdf)

<sup>155</sup> FCC Press Release “Ninth Annual report on Competition in Video Markets” 31 December 2002 Page 5 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-229984A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-229984A1.pdf)

<sup>156</sup> TiVo Web site <http://www.tivo.com>

<sup>157</sup> UltimateTV web site <http://www.ultimatetv.com/>

<sup>158</sup> ReplyTV web site <http://www.replaytv.com/>

and one, Echostar<sup>159</sup> is offering the service combined with its satellite offering. An interesting feature with the latest version of the ReplayTV PVR is the ability to send video recording to another user of a ReplayTV PVR via broadband Internet<sup>160</sup>. It was predicted that by the end of 2002 1.5% of US households would have a PVR but by 2008 this would have increased to 25%<sup>161</sup>.

## **South America**

### **Brazil**

Brazil has a population of 160 million with an estimated 40 million TV homes. The vast majority watch free-to-air television and analogue rather than digital. Cable had established a small segment but the launch of DirecTV and Fox satellite services has put cable under pressure. Satellite is growing but is still only of the order of 1%.

There are plans for Digital Terrestrial services. Brazil wants to use high definition for prestige sporting events (TV Globo took great pride and credit in arranging a high definition feed of last year's World Cup soccer for display to invited guests). However, at the other end of the spectrum, DTT also has to support poorly financed regional broadcasting where economy is the name of the game (Globo have over 100 local affiliates to their network). The widespread adoption of DVB-T should stand in its favour from this point of view as well as the obvious technical advantages.

Brazilian communications company, NORTV, plans to roll out an ITV service from end of 2002 onwards to 200,000 homes in the cities of Londrina, Ibirora, Cambe, Jataizinho, and Rolandia. The service, which will be based on MMDS wireless technology, will include VOD, gaming, Internet access and other ITV functionality<sup>162</sup>.

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<sup>159</sup> "DISH Network to Introduce New, Improved Personal Video Recorder: DishPVR 508 Satellite TV Receiver" Press Release 9 January 2002 [http://www.corporate-ir.net/ireye/ir\\_site.zhtml?ticker=dish&script=410&layout=-6&item\\_id=244542](http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=dish&script=410&layout=-6&item_id=244542)

<sup>160</sup> "SONICblue Unveils ReplayTV 4500 Series; Kicks Off ReplayTV Retail Push" Press Release 3 June 2002 <http://www.replaytv.com/company/press.asp?ID=555>

<sup>161</sup> "DVR Competitive Market Report" 2002 The Carmel Group

[http://www.carmelgroup.com/publications/reports/dvr\\_report\\_request.cfm](http://www.carmelgroup.com/publications/reports/dvr_report_request.cfm)

<sup>162</sup> Source: Tracy Swedlow's InteractiveTV Today Issue 4.72 September 23, 2002