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Abstract:

This Public Synopsis of the Interactive Digital Television document provides an overview of the iDTV market including a short background introduction and outline of interactive features.

Keywords:

- Exploitation
- Business
- Market
- Technology
- iTV
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1 Introduction

This Public Synopsis on Interactive Digital Television provides an overview of the iDTV market including a short background introduction and outline of interactive features. The different sections in which the document is divided cover the different types of existing services and solutions as well as market trends.

The rapid development in TV interactive services and programming is driven by the need to develop new revenue streams in a competitive TV market environment. This need for interactivity was already foreseen in the early days of television, when producers, for the first time, tried to make their programmes and channels more dynamic and participatory. In the case of children's television, for example, the interactive element often involved trying to get the youngest viewers to sing along, jump up and down or dance around the room.

Interactive television (iTV) can be broadly defined as any feature that enables television viewers actively participate in a viewing experience. More specifically, it can be defined as a dialogue that takes the viewers beyond the passive experience of watching TV to actively make choices and take actions.

Enabling viewers' interaction with TV content can be achieved by different means, whether it is responding to an ad or accessing internet-based services. For example, viewers can take part in a TV programme, play games, make purchases and even send text messages and emails, all within the context of the television environment. Interactive television allows advertisers, broadcasters and site operators to provide contextual services by means of engagement.

2 Interactive Digital Television

2.1 iDTV Description

The shape interactive television has been evolving since the early days of TV as a completely stand-alone household appliance. The early interactive phases took the form of a remote control that has since become an important personal tool for information and entertainment.

While interactivity is found in multiple devices of everyday use, TV viewing itself has experienced a great deal of change over the years, increasingly moving towards a more individualised experience and involving a higher degree of participation and viewer input.

iDTV takes viewers beyond the passive experience of viewing to allow them to make choices and take actions supported by digital base technology. iDTV also allows viewers to access information or engage in dialogue with the television content or the television broadcasters.

Taking into account this abstract definition, iDTV includes services provided by broadcasters and iTV content providers. However, there are also functionalities provided by consumer devices connected to the TV set that provide a certain degree of interactivity and that are unrelated to any broadcaster or any other organisation.

Devices such as Personal or Digital Video Recorders, for example, provide viewers with an alternative to traditional appointment TV, by either recording the programme or by using a time-shifting functionality. They allow the viewer to have control over how and when to consume the audiovisual content. Traditional TV content suppliers (such as cable networks, TV studios and broadcast networks) are becoming increasingly concerned as people are no longer locked into fixed viewing experiences, for example they can now skip commercials and other programming information features which may lead to a weakening of revenue sources for broadcasters.

2.2 Types of iDTV

Given the many forms of television interactivity, for classification purposes, we have organised the types of interactivity according to the nature of interaction. This classification of iDTV does not take into account technical issues, but instead provides conceptual definitions.

2.2.1 Personal TV

Personal TV (PTV) allows the viewer to watch the programming they want, when they want it. The purpose of the service is precisely to avoid fixed programming schedules (Appointment TV). True to form, PTV comes with features such as fast forward, slow motion, pause and rewind similar to a DVD. These features can be provided by a service commonly deployed on IPTV solutions or by a consumer device. In both cases, the viewer has access to a time-shifting functionality.

Content wise, Personal TV interactivity provides functionalities such as:

- Audiovisual content manual or automatic classification
- Audiovisual or interactive content browsing based on the classification of live and non-live content. Viewers could also access their favourite content list or favourite ac-

tor/actress and retrieve the available associated content

- Viewers could also be advised when an audiovisual content, with similar parameters to those that he/she usually enjoys, has become available
- The possibility of selecting content from a large catalogue, so there should always be content that matches the viewer interest available
- Content search of based on time or classification parameters

Future wise, a step forward for the individualisation of Personal TV could be the availability of content in different locations in the home and outside the home; viewers are thereby free to consume TV not only whenever they decide to do so but also wherever.

The following functionality list provides additional examples of how this freedom could be achieved.

- Recording programmes and sending it to portable media devices for viewing while away from the actual TV set
- Sending programmes from one room to another between networked devices
- Storing and viewing digital photos on TV
- Sharing shows with others who own compatible devices / services

2.2.2 Permanent Interactive Services

Permanent interactive services are those iTV services independent of the audiovisual content. A clear example of those is general information services that are commonly available and that are not associated to any particular programme. Within this group, we have identified:

- Electronic Programme Guide (EPG)
- Weather forecast
- Traffic updates
- General information systems
- Interactive advertising
- Text services
- E-business services

2.2.3 Enhanced Television

The concept Enhanced television (ETV) is understood as interactive television content that is associated to a specific theme, usually depending of a scheduled broadcast programme. ETV might provide access to additional material related to the programme or offer other means of interaction such as voting or messaging or participating in a game or quiz. Therefore, ETV may be available for the duration of a scheduled programme or for a period before or after transmission.

Usually, this type of interactivity is offered in popular scheduled programmes, with the necessary market size to offset the expensive software development expenses needed to deploy the service.

3 IDTV Services

In iDTV, interactive applications are software programmes that enable interaction, whether this takes place locally (at home) or remotely (with the actual contents provider).

Aiming to organise this criteria and with the intention of classifying interactive applications, we will take into consideration the following aspects:

- The presentation style or format in which iDTV Services are presented.
- Their interactive application content.
- Any geographical constraints of the interactive application.
- The moment in which the interactive action takes place and its relation with the rest of the audiovisual information suitable to television programming.

3.1.1 IDTV Services According to Presentation Style or Format.

BANNERS

Although interactive banners are exclusively connected to the web, banners are already present in analogue and digital television; advertising other programmes, and programme sponsors' brands.

The IAB¹ provided with a set of guidelines aiming to make ad sizing predictable and accepted for both consumer and producer. It has also named these web advertisements "interactive marketing units".

A banner occupies a small fraction of the screen. It is used to recall attention and usually provides access to a second interactive application. Banner ads are also a form of advertising on the Web. This form of online advertising, embedding an advertisement into a web page, is intended to attract traffic to a website by linking them to the web site of the advertiser.

CHAT

The word Chat describes any form of synchronous conferencing (CMC or Computer-Mediated Communication); occasionally even asynchronous conferencing (sending data blocks). The term applies to technology ranging from real-time online chat over instant messaging and online forums to fully immersive graphical social environments.

A message sent by the user appears on the receivers screen by means of SMS or even electronic mail.

There is a classic version of the chat available for television that was made popular on the internet. This version also requires user visitation of different virtual rooms or channels where the user can keep conventional textual conversations without the need to watch any specific TV channel.

¹ IAB stands for Interactive Advertising Bureau is home to interactive marketing across Europe, and the network of trade associations driving the digital economy.

PICTURE-IN-PICTURE (PiP²)

A second information box appears at user's request. (I.e. an interactive ad regarding the opening of a new theatre play could also offer an interview with one of the main characters)

Several screen options also offer interaction when for instance, on a sports event, the user is shown a number of elective screens simultaneously to choose a camera angle.

ELECTRONIC MAIL (eMail)

It allows access to an email account from the television just like on a computer.

SHORT MESSAGE SERVICE (SMS)

TV SMS services allow interaction using short messages, primarily text messages (such as "instant messages") with the network operator and/or others who are using SMS enabled devices such as mobile phones. TV viewers send SMS messages from a non-mobile device such as their TV system to a mobile device such as a mobile phone. For instance, when a poll, quiz or contest is offered during a TV show, viewers might be able to interact with the program via SMS.

3.1.2 IDTV Services According to Interactive Application Content.

These contents can be as varied as the information contents found in other media such as news, weather, traffic updates, cinema lists, transport locations, stock exchange...etc.

EPGs

EPGs or Electronic Program Guides, for example, allow total control of TV content programming with actions such as access to TV listings, content descriptions, setting up schedules and alarms for favourite programs.

BANKING

Interactive digital banking allows its users to manage their personal bank accounts cards, investments making transactions and viewing financial statements.

COMMUNICATIONS

In this case, software makes it possible to communicate using such as tools as SMS, electronic mail and chat.

SPORTS

It allows access to sport results, lotto, competition calendars, statistics, and information about the different teams, history and professional players' profiles.

ADVERTISING

Interactive advertising uses images, texts, web links, Flash animations, audio/video clips and more approved from user to user chain letter-style, via email. It entails features such as promotions, iAds and campaigns.

Possibly one of the most effective implementations of interactive advertising is viral marketing. Viral marketing uses existing social networks to increase brand awareness, through self-replicating viral (meaning like a 'virus') processes.

It is possible for this type of advertising to be extended to television through DAL (Dedicated

² PiP (Picture in Picture), invented by Greg Dockery allows one to watch more than one TV program (channel) at the same time on television sets or other devices. With PiP feature of TV, one program will be displayed on the entire TV screen, and another program or programs will be displayed in individual smaller squares on the screen

Advertising Location) applications.

HIFE

HIFE is the acronym for Hybrid Interactive Fan (or Family) Entertainment. HIFE refers to the practice of adding play/voting elements to a TV program; except those built for and with interactive elements built in, such as a game show.

HIFE includes features for voting or giving the opinion on a subject as well as trivia elements in on-screen questions, sometimes linked to winning prizes.

As well as using mobile phones, HIFE also takes place through voice-mail, SMS, MMS, email, mobile phones or fixed landlines.

BETTING

One of the newest and faster developing remote gambling platforms is the television. Over the last couple of years, gambling services through Interactive Television have grown in both frequency and variety. From traditional betting to live and interactive bingo, fixed-odds-gambling and betting on live sporting events. It is almost certain that, over the next couple of years and taking into account changes in gambling regulations, gambling opportunities through iTV will increase further, with new forms of gaming being introduced to the viewer.

VOTING

Without a voting application option over some element of its programming independent producers, no matter how large, would struggle to fund future interactive development. So, it is not surprising that voting is playing such an important role in the growth of independent TV content producers and broadcasters.

QUIZ AND TRIVIA

Quiz and trivia applications enable viewers to join interactive programs at any stage and participate. They can compete against other quiz contestants, located at a studio or at home, by answering a series of multiple-choice questions in real-time using their remote controls.

NEWS / INFORMATION

Applications such as Sky News Active (UK) and ARD Interactive (Germany) are designed as full screen applications with embedded smaller video screens.

Information offered in these services comes in the form of text and video switching formats. At the heart of the Sky service, for example, are a series of extra 'mini-screens' that the viewers can select for themselves. The mini-screens provide additional coverage of news, weather, finance and entertainment and are constantly updated with breaking headlines.

Viewers can navigate through their selected choices using their remote controls at any time in the service.

PAY-PER-VIEW (PPV)

PPV offers television viewers the possibility to purchase content to be seen on TV and pay later for their private telecast.

3.1.3 IDTV Services According to Geographical Constraints.

LOCAL

Viewers interact with the information stored on a reception unit. This information is renewed every so often as the interactive application acts as a permanent service such as EGPs and Su-

per teletext.

Superteletext is an information retrieval service provided by television broadcast companies; essentially, superteletext is an enhanced version of basic teletext with always visible video flows, images and pictures with greater details. Basic Teletext pages can be viewed on television sets with suitable decoders. They offer a range of text-based information, usually including national, international and sporting news, weather and TV schedules.

REMOTE

Viewers interact with an external service provider via a downlink that allows information return. Viewers can make travel reservations, buy transport tickets, make banking consultations, carry out electronic administration (Tax payments, fees, arrange doctor's appointments) betting, voting and shopping.

3.1.4 IDTV Services According to Time Constraints.

PERMANENT INTERACTIVE SERVICES.

Permanent interactive services are always available during the transmission of a digital channel; the user is able to enquire and interact whenever he/she wants to do so, regardless of the showing programs.

SYNCHRONISED SERVICES.

These interactive services are synchronised with the emission of specific programs and contents in a way that they complement audiovisual information or services whilst the viewer can continue watching a program on a reduced size screen.

4 Current iDTV solutions

Nowadays, the complexity of the digital television landscape is due, to some extent, to technology convergence. At the same time, companies are looking for new sources of income and searching for new services and business models.

4.1 iDTV Successful Solutions

In this section we review some of the most representative successful interactive solutions available.

4.1.1 Banking & Financials: Bloomberg ITV

Bloomberg is offered through Sky Digital UK. The service includes a broad variety of financial information and services including a markets section offering UK prices information, and European and World market data (FTSE, Dow Jones, CAC40, Nikkei, and Dax). The service also allows the viewer to call up graphical charts that plot market fluctuations over different time periods.

Viewers can also interact with the Bloomberg channel in the form of voting.



4.1.2 Communication: MCS Tutte le mattine

This popular Italian show is provided exclusively on Digital Terrestrial Television. Audiences can watch a real time translation of the programme in sign language.

In sections such as “You Choose the subject” the audience has the opportunity to pick and vote the subject that they want to see discussed. Furthermore, by sending in their mobile phone number, the audience also receives an SMS to remind them when the subject in question will be debated.



4.1.3 Entertainment: Visi-Carrousel on France's Visiware

Visi-Carrousel is a Playin'TV program for the family by Visiware. The games show allows

the simultaneous broadcasting of 4 to 8 games.

Visiware's channels are received by more than 50 million households around the world and available in more than 75 countries, over 29 cable or satellite providers.



4.1.4 Interactive Advertisement: Adidas on UK's Sky Digital (Open TV)

Adidas 'Jonny & Becks' campaign featured Rugby star Jonny Wilkinson and football star David Beckham sharing their kicking skills on the pitch. The interactive advertisement is accessible from a red button call-to-action in the traditional campaign and also from a banner advertisement in the Sky Gamestar portal.

They use a so-called DAL application (Dedicated Advertiser Location) designed by Weapon7 allowing viewers to view 90 seconds of the TV advertisement and to access out-takes from the filming of the campaign.

The application design is also enhanced with coding so that it switches between the two video feeds with what can be described as a set-top-box generated video 'wipe'.

4.1.5 Sports Retransmission

Premiere's interactive applications allow subscribers to order and view films, adult entertainment and sporting events by using the telephone, internet and text message. Premiere broadcasts the UEFA Champions League through a unique conference link up, German football leagues and Formula One races from six different angles selected at will by using the remote control.

Interactive Formula One offers an information and interaction platform during the retransmissions with viewer's involvement via internet, telephone or text message. Existing sports reporting has been extended to include additional ODDSET betting facility.



Olympic Games on BBC iTV

Traditionally, coverage of the Games comes from a broadcaster based in the country that hosts the Games. In 2004, the organising committee contracted coverage to Athens Olympic Broadcasting that was responsible for producing the international venue coverage and delivering an international signal package comprising 40 feeds to the International Broadcast Centre.

BBC Sport received these feeds through the European Broadcasting Union, which provided technical and operational facilities for its members. The network coverage originated from Athens for BBC One and BBC Two. Producers in an on-site BBC interactive control room were able to select up to five of the available sources for the interactive service to route back to BBC Television Centre in London where the final programme was produced. (www.informitv.com)

Among other innovations is the use of digital video effects to enhance BBC coverage by combining representations of time and space.

On the BBC's iTV Olympic retransmission, viewers were able to access a number of simultaneous video feeds coming out of Greek Olympic sites.

Wimbledon

BBC Wimbledon 2001 Interactive served viewers with an unprecedented choice of action during the tournament. BBC enabled its Digital Satellite viewers to select the match they wanted to watch from a choice of up to five live games at any time via a Multiscreen devised by BBC New Media.

Viewers were prompted to press the red button on their handset during the coverage on digital BBC ONE or TWO. This took them through to the BBC Wimbledon Interactive Multi-screen. Furthermore, viewers were also able to access a further four live matches.

4.1.6 Meteo & Tourist Initiatives: Chaine Meteo on France's Canal Satellite

La Chaine Meteo offers an interactive weather service, developed by Pixtel, to French homes receiving the Canal Satellite bouquet. The service, running on MediaHighway, allows the viewer to access detailed information without leaving the video of the main weather channel.

Services include local weather search by location on over 36,000 regions and the possibility to memorise preferences for future requests. The service is designed to generate revenue on premium information accessed via telephone.

Other services include national weather charts, traffic information, snow and beach reports, plus webcams throughout France. Interestingly, content is displayed on screen as the viewer waits, background and icons build-up element by element, giving the viewer the impression that something is happening and they are about to be rewarded.

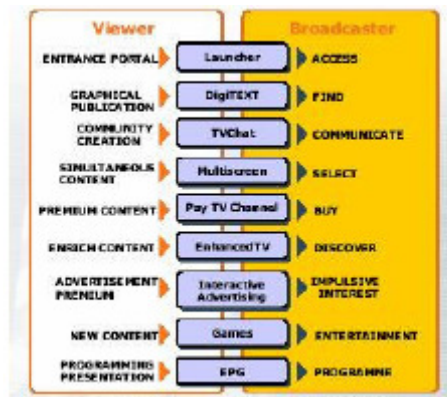


4.1.7 Information Services: Retesit 2.0. Project on Spain's Abertis Telecom

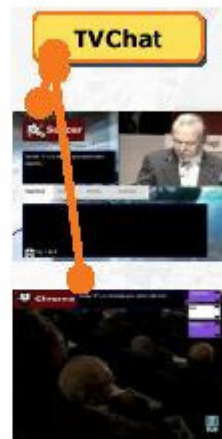
Retesit 2.0. (RETEvision Servicios InTeractivos) is an active project lead by Abertis Telecom

and developed by other partners including Movilisto, Fresh-IT Technologies, TVC Multimedia and Televisión Española. The project's main objectives are to extend the functionalities of the platform to offer interactive services and centralised service information. Increase the number and type of interactive application. It aims to bestow the platform with the necessary tools and offer software update downloads.

It also carries out promotional activities within the Madrid Region with previews of new content in better quality. The interactive applications are based on European MHP standards.



To enable access to and navigation in applications a launcher tool is developed:



On this pool of basic applications the different applications can be combined.

5 iDTV Market

Television, as a mass medium, is a key reference for individuals throughout their daily activities: it provides viewers with greater awareness of their social environment, helps them to form an opinion on main current affairs, and promotes social interaction. As the industry evolves and more channels appear, television will continue to develop into the information and entertainment medium of choice. This aspect is characterised by audience fragmentation and segmentation and it also involves the broadcasting of a great variety of contents that are not usually broadcasted live. In this context, television can be considered as another window for audiovisual content use and distribution in which it shares its leading role alongside cinema, pre-recorded hardware (VHS, DVD...), etc. As far as demand goes, specific programmes will always play a key role, whilst operator's managed channels and programming schedules lose some of their relevance.

Traditional television, which is free-to-air broadcast, is a prime example of mass media. User segmentation and the transmission of highly varied specific content are characteristics closely linked to pay television. In this context, television becomes a new way of digital video distribution, boosting the entertainment and leisure appeal to this medium.

Rising media consumption is being propelled by major investments in new technologies. From broadband connectivity to digital audiovisual broadcasting, most media organisations have been presented with new marketing alternatives and new product formats, made possible by new platforms, devices and electronic media. And with those technologies maturing, the audience fragmentation process is likely to accelerate.

A fragmented audience is also a more specific audience, and one that can be more accurately targeted by advertisers. Though the practices are still in their infancy, next years should see a growing number of attempts to advertise to such audiences.

5.1 Free-To-Air

With examples such as UK's ITV Digital and Germany's Kirch, the last couple of years have seen some spectacular failures in the digital terrestrial TV (DTT) European market (<http://www.interactivetvweb.org>). Governments have a major interest in making DTT a success as vast licensing fees are in the waiting with the freeing-up of the spectrum used by current analogue TV. Despite governments shift towards DTT, consumers are not moving rapidly to make this transition.

Law and regulation in most countries force cable companies to carry local programming. Given this, there is no incentive for customers to buy digital receivers for free-to-air services that are available as part of digital cable services.

Greater diversity of content appears to be the key to success. This is one of the causes of ITV Digital's failure in the UK; their competitor, BskyB, was simply able to offer more attractive, as a result, viewer numbers (and advertising revenue) did not grow as swiftly as was needed to recover the capital investment.

Free-to-air networks may never be able to offer the level of traditional content (e.g. Hollywood movies, sports broadcasts and other premium content) that is offered by pay TV services. This is mainly due to the lack of a subscriber model provides them with less revenue, and thus less free assets to spend on content.

Without this kind of subscriber model, there is no possibility to provide more services to peo-

ple who will pay more, no way to offer pay-per-view content, and generally, no consistent way to recover the investment that could be made in such content.

Spanish public service channels, as an example, are state funded but they also get that extra revenue from advertising. At present, there is a limit of 12 minutes per hour dedicated to advertising during broadcasting. Furthermore, revenue of free-to-air channels coming from basic interactive services made by calls to 800 numbers or SMS is increasing in importance. Voting in contests or sending SMS to appear onscreen are some examples of this growing business model.

5.2 Pay Platforms

Pay platforms are depended on very mature technology and on a consolidated industry. Basically, they have relied on digital television from a long time using different distribution mechanisms. Market providers are well established and have consolidated products and services.

Most of the pay platforms of digital television have previous experience with interactive services, and they start this race with the advantage of skills that traditional broadcasters lack, as they shift onto the digital medium.

It is worthwhile to mention the mergers taking place among Pay TV platform companies, resulting in a concentration of solid organisations. These organisations' main source of income is subscription fees and pay-per-viewing. However, they can also exploit different alternative sources of revenues, such as pay interactive services and advertising.

Consequently, pay platforms can benefit from the same revenue streams as free-to-air organisations, plus subscription fees and pay-per-view revenues. The downside is the actual size of the audience; which currently considerably lower than the free-to-air broadcasting market.

5.3 Broadcaster and Television Digital Media Strategies

During the last few years, there has been an increasing tendency towards a complete digital production process in all media sectors. The two principal drivers are the need to reduce costs and increase revenue. Digital production typically involves lower production costs.

However, media companies that move too early may end up suffering from unstable, immature technology that reduces rather than increases efficiency. They may also pay too much for technology that is on a downward price spiral. Laggards, on the other hand, are likely to find themselves outpaced by competitors who are quicker to achieve reliable revenue sources and an efficient cost base. Media companies undertaking widespread digitalisation of production facilities should also protect themselves against new risks such as increased vulnerability to hackers and intellectual property theft. For example, moving to network-based storage provides greater access and immediacy, but may also expose a media company's assets to viruses and pirates.

On the other hand, digitised media production should enable a variety of new revenue streams for media companies. It can make content archives more accessible. It can automate digital rights management. And it can make the repurposing of content easier. Digital media production can also make it easier to supply content in new formats. For instance, recorded interviews for a newspaper can also be sold as podcasts. Television and radio comedies can be turned into online talking books. Photos taken for a newspaper article can be made available to agencies and end-customers worldwide.

Increased revenue growth is likely to be the most convincing argument for the shift towards

digital production and distribution, yet some media companies may not be investing enough resources to understand how the two can be linked.

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7 Glossary

Term	Definition
ACAP	Advanced Common Application Platform (ACAP) is intended to provide television consumers with advanced interactive services and offer content providers, broadcasters, cable and satellite operators, and consumer electronics manufacturers the technical details necessary to develop interoperable services and products.
3G LTE	3rd Generation Long Term Evolution.
3GPP	3rd Generation Partnership Project. The scope of 3GPP is to make a globally applicable third generation (3G) mobile phone system specification within the scope of the ITU's IMT-2000 project. 3GPP specifications are based on evolved GSM specifications, now generally known as the UMTS system. It is a co-operation between ETSI (Europe), ARIB/TTC (Japan), CCSA (China), ATIS (North America) and TTA (South Korea).
ADB	Advanced Digital Broadcast
ADSL	ADSL or Asymmetric Digital Subscriber Line is a form of DSL, a data communications technology that enables transmission of information at high bandwidths over existing twisted-pair copper telephone lines to homes and businesses.
ADSL2+	ITU G.992.5 is an International Telecommunication Union standard, also referred to as ADSL2+ or ADSL2Plus. This extends the capability of basic ADSL by doubling the number of downstream bits.
ARPU	Average Revenue Per Unit or Average Revenue Per User.
ASP	Application Service Provider.
ATSC	Advanced Television Standards Committee
BBS	BBS or Bulletin Board System is a network computer software that allows its users to connect to the Terminal system and download data, news, Chat with other users, on-line games...etc. Typically, it consists on a message database where people can log in and leave broadcast messages for others; these messages are usually organised into topic groups.
BML	Broadcast Mark Up Language.
BRAN	Broadband Radio Access Networks.
CAM	Conditional Access Systems.
CATV	Cable Television. Formerly known as Community Antenna Televisio and often mistaken for Community Access Television.
CCRTV	The Catalan Corporation of Radio and Television or Corporació Catalana de Ràdio i Televisió is the public radio and television company in Catalonia owned by Generalitat de Catalunya.
CDN	Content Delivery Network (CDN) describes a system of computers networked together across the Internet that cooperate transparently to deliver content (especially large media content) to end users.
CENELEC	Comité Européen de Normalisation Electrotechnique or the European Committee for Electrotechnical Standardisation. CENELEC is responsible for European Standardisation in the area of electrical engineering. Together with ETSI (telecommunication) and CEN (other technical areas) CENELEC form the European system for technical standardisation.
CIF / QCIF	CIF (Common Intermediate Format) is used to standardise the horizontal and vertical resolutions in pixels of YCbCr sequences in video signals. QCIF means "Quarter CIF". SQCIF means "Sub-quarter CIF". These two formats are common in video encoding. To have one fourth of the area as "quarter" implies, height and width of the frame are halved.
CPE	Customer Premises Equipment or customer-provided equipment is any terminal and associated equipment and inside wiring located at a subscriber's premises and connected with a carrier's telecommunication channel(s) at the demarcation point ("demarc").
CPU	Central Processing Unit.
CSS	Cascading Style Sheet

Term	Definition
DAB	Digital Audio Broadcasting.
DAL	Dedicated Advertising Location. A DAL is a visually rich service for brands looking into interactive television advertising. The product takes the viewer out of the broadcast stream and into the brands' own television channel.
DBS	Direct Broadcast Satellite.
DNS	Domain Name System.
DOCSIS	Data Over Cable Service Interface Specification (DOCSIS) is an international standard developed by CableLabs.
DRAM	Dynamic random access memory. DRAM is a type of random access memory that stores each bit of data in a separate capacitor within an integrated circuit.
DRM	Digital Rights Management (DRM) involves the description, identification, trading, protection, monitoring and tracking of all forms of rights usages over both tangible and intangible assets - both physical and digital form - including management of rights holders' relationships.
DSLAMs	Digital Subscriber Line Access Multiplexers are network devices that allow telephone lines to make faster connections to the Internet.
DSM-CC	Digital storage media command and control. DSM-CC is a toolkit for developing control channels associated with MPEG-1 and MPEG-2 streams.
DTH	Direct To Home.
DTT	Digital Terrestrial Television.
DTV	Digital Television
DVB	DVB, short for Digital Video Broadcasting, is a suite of internationally accepted, open standards for digital television maintained by the DVB Project, an industry consortium with more than 270 members, and published by a Joint Technical Committee (JTC) of European Telecommunications Standards Institute (ETSI), European Committee for Electro technical Standardisation (CENELEC) and European Broadcasting Union (EBU).
DVB-C	Digital Video Broadcasting - Cable
DVB-H	Digital Video Broadcasting - Handheld
DVB-S	Digital Video Broadcasting forward error coding and modulation standard for satellite television.
DVB-T	Digital Video Broadcasting - Terrestrial
DVR	Digital Video Recorder.
EBU	European Broadcasting Union
ECMAScript	ECMAScript is a scripting programming language, standardised by Ecma International in the ECMA-262 specification. The language is widely used on the web, and is often referred to as JavaScript or JScript, although those two languages are extensions of the ECMA-262 standard.
EPG	Electronic Program Guide
ETSI	European Telecommunications Standards Institute
ETV	Enhanced Television.
FCC	The Federal Communications Commission (FCC) is an independent United States government agency, created, directed, and empowered by Congressional statute.
FTA	Free-To-Air is a term used to describe television and radio broadcasts which are broadcast unencrypted and may therefore be picked up via any suitable receiver.
FTTC	Fibre To The Curb or Fibre To The Cabinet refers to a telecommunications system based on fibre-optic cables run to a platform that serves several customers. Each of these customers has a connection to this platform via coaxial cable or twisted pair.
FTTH	/ Fibre to the Premises (FTTP), Fibre to the Home (FTTH), or fibre to the building (FTTB) is
FTTP	/ a broadband telecommunications system based on fibre-optic cables and associated optical
FTTB	electronics for delivery of multiple advanced services such as of telephone, broadband Internet and television across one link (triple play) all the way to the home or business.
GEM	Globally Executable MFP.

Term	Definition
H.264	H.264, MPEG-4 Part 10, or Advanced Video Coding (AVC), is a digital video codec standard which is noted for achieving very high data compression. It was written by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC Moving Picture Experts Group (MPEG) as the product of a collective partnership effort known as the Joint Video Team (JVT).
HDMI	High-Definition Multimedia Interface is an all-digital audio/video interface capable of transmitting uncompressed stream providing an interface between any compatible digital audio/video source, such as a set-top box, a DVD player, a PC, a video game system, or an AV receiver and a compatible digital audio and/or video monitor, such as a digital television. It incorporates Digital Rights Management technology.
HDSL	High Data Rate Digital Subscriber Line was the first DSL technology that uses a higher frequency spectrum of copper, twisted pair cables.
HDTV	High Definition Television.
HE-AAC	High Efficiency Advanced Audio Coding.
HIFE	Hybrid Interactive Fan (Family)
HIPERMAN	High Performance Radio Metropolitan Area Network is a standard created by the ETSI BRAN group to provide a wireless network communication in the 2 - 11 GHz bands across Europe and other countries which follow the ETSI standard.
HSDPA	High-Speed Downlink Packet Access is a mobile telephony protocol, a 3G technology, which provides a smooth evolutionary path for UMTS-based 3G networks allowing for higher data transfer speeds.
HTML	HyperText Mark-up Language.
IAB	Interactive Advertising Bureau
IPTV	Internet Protocol Television. IPTV describes a system where a digital television service is delivered using the Internet Protocol over a network infrastructure, which may include delivery by a broadband connection.
IRD	Integrated Receiver / Decoder.
ISDB, ISDB-T, ISDB-S, ISDB-C	Integrated Services Digital Broadcasting is the digital television (DTV) and digital audio broadcasting (DAB) format that Japan has created to allow radio and television stations there to convert to digital. The core standards of ISDB are ISDB-S (satellite television), ISDB-T(terrestrial), ISDB-C (cable)
ISDN	Integrated Services Digital Network.
ISMA	The Internet Streaming Media Alliance was Founded in December 2000, by Apple Computer, Cisco Systems, IBM, Kasenna, Philips, and Sun Microsystems. It is a non-profit corporation whose mission is to accelerate the market adoption of open standards for streaming and progressive download of rich media over all types of Internet Protocols (IP).
ITU	International Communications Union.
ITU-R	The ITU Radio communication Sector is a standards body subcommittee of the International Telecommunication Union (ITU) relating to radio communication. Its role is to regulate the allocation of radio frequencies and so reduce the interference between radio stations in various countries and it is also responsible for regulating orbital positions of satellites relating to radio communications.
JPEG	The name JPEG stands for Joint Photographic Experts Group; JPEG a commonly used standard method of compression for photographic images.
LCD	Liquid Cristal Display.
LNB	Low Noise Block converter
MAC	Media Access Controller.
MBMS	Multimedia Broadcast Multicast Service (MBMS) is a broadcasting service that can be offered via existing GSM and UMTS cellular networks. The infrastructure offers an option to use an uplink channel for interaction between the service and the user, which is not a straightforward issue in usual broadcast networks, as for example conventional digital television is only a one-way (unidirectional) system. MBMS uses multicast distribution in the core network instead of point-to-point links for each end device.

Term	Definition
MBONE	"Multicast Backbone" is an experimental backbone for IP Multicast traffic across the Internet.
MediaFLO	MediaFLO is Qualcomm's new technology to broadcast data to portable devices such as cell phones and PDAs.
MHEG-5	Multimedia and Hypermedia Information Coding Expert Group. MHEG specifies the classes of multimedia objects available and their interchange.
MHP, DVB-MHP	Multimedia Home Platform is an open middleware system standard designed by the DVB project for interactive digital television.
MMDS	Multichannel multipoint distribution service. (A.k.a MMDS or Wireless Cable) is a wireless telecommunications technology used for general-purpose broadband networking or as an alternative method of cable television programming reception.
MoU	Memorandum of Understanding.
MP3	MPEG-1 Audio Layer 3 or MP3 is a popular digital audio encoding and loss compression format, designed to greatly reduce the amount of data required to represent audio.
MPEG-2	MPEG-2 is the designation for a group of coding and compression standards for Audio and Video (AV), agreed upon by MPEG (Moving Picture Experts Group)
MPEG-4	MPEG-4 is a standard used primarily to compress audio and video digital data. MPEG stand for Moving Picture Experts Group.
MSO	Multiple Services Operator. Operator for multiple cable television systems.
MSTV	Microsoft TV
NBC	National Broadcasting Company.
NLOS	Non-line-of-sight or near-line-of-sight is a term used to describe radio transmission across a path that is partially obstructed, usually by a physical object in the Fresnel zone.
NTSC	NTSC is the analogue television system named after the National Television Systems Committee, the U.S. standardisation body that adopted it. NTSC is in use in Canada, Japan, South Korea, the Philippines, the United States, and some other countries, mostly in the Americas.
NVoD	Near Video On Demand. It offers the same service as a video rental company, where the consumer is able to pause, rewind, and fast forward a movie. This service does not involve the use of interactive options.
OCAP	OpenCable Application Platform.
OFDM	Orthogonal Frequency-Division Multiplexing is essentially the same thing as Coded OFDM as well as discrete multitone modulation (DMT) and it is based upon the principle of frequency-division multiplexing (FDM), but is implemented as a digital modulation scheme.
PAL	Phase-Alternating by Line or Phase Alternation Line, is a colour encoding system used in broadcast television systems in large parts of the world.
PCF	Portable Content Format.
PCMCIA	Originally PCMCIA card is a PC card is the form factor of a peripheral interface designed for laptop computers. Originally meant to be used for memory expansion, but the existence of a usable general standard for notebook peripherals led to all manner of devices being made available in this form. Typical devices include network cards, modems and hard disks.
PDA	Personal Digital Assistant.
PIP	Picture in Picture allows one to watch more than one TV program or channel at the same time on television sets or other devices. With PiP feature of TV, one program will be displayed on the entire TV screen, and another program or programs will be displayed in individual smaller windows on the screen.
PNG	Portable Network Graphics is a bitmap image format that employs lossless data compression.
PPV	Pay-Per-View.
PSK	Phase-shift keying is a digital modulation scheme that conveys data by changing, or modulating, the phase of a reference signal (the carrier wave).

Term	Definition
PTV	Personal Television.
PVR	A Personal Video Recorder, also referred to as DVR or Digital Video Recorder, is an interactive electronics device that records television shows in a digital format. The television shows can be stored client-side or server-side.
QAM	Quadrature amplitude modulation is a modulation scheme which conveys data by changing the amplitude of two carrier waves.
QCIF	Quarter Common Intermediate Format
QoS	The term Quality of Service (QoS) refers to a broad collection of networking technologies and techniques. The goal of QoS is to provide guarantees on the ability of a network to deliver predictable results. Elements of network performance within the scope of QoS often include availability, bandwidth, delay, and error rate.
QTSS	QuickTime Streaming Server
RCA	Radio Corporation of America.
RTSP	Real Time Streaming Protocol.
SCART	(from Syndicate des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs) is a French-originated standard and associated 21-pin connector for connecting audio-visual equipment together.
SD-HD	Standard and High Definition
SDK	Software Development Kit.
S-DMB	S-DMB is a hybrid version of Digital Multimedia Broadcasting. It incorporates a high power geostationary satellite for outdoor and light indoor coverage integrated with a terrestrial repeater (low power gap-filler) network for indoor coverage in urban areas.
SDP	Session Description Protocol is a format for describing streaming media initialization parameters.
SECAM	Also written SÉCAM, Séquentiel couleur à mémoire, French for "sequential colour with memory", is an analogue colour television system first used in France.
SKT	South Korean Telecom
SMS	Short Message Service.
SoC	Real Time Streaming Protocol.
SOHO	Small Office/ Home Office
STB	Set-Top Box (STB): The term set-top box describes a device that connects to a television and some external source of signal, and converts the signal into picture displayed on the screen and sound. The signal source might be a satellite dish, a cable, a telephone line, a DSL connection, or even an ordinary VHF or UHF antenna. In IPTV networks, the set-top box is a small computer providing two-way communications on an IP network and decoding the streaming video.
StreamCDN	Media Content Delivery Network
SUI	Subscriber User Interface
SVoD	Subscription VoD
TDC	Technology Development Corporation
T-DMB	Terrestrial Digital Multimedia Broadcasting.
TNT	Turner Network Television is a cable TV network created by media mogul Ted Turner.
Triple-Play	Triple-Play is the title given to the service that collectively offers broadband Internet access, television service, whether it be video on demand or live, and phone service. Triple-Play services are offered by both cable and telephone operators. In telecommunications, a triple play service would include IPTV, voice over IP (VoIP), and broadband Internet access.
TVML	TéléVIsion Mobile Sans Limite is a project led by Alcatel that plans to develop a DVB-H standard suitable for hybrid satellite and terrestrial transmission.
TVRO	Television Receiver Only.
TWC	Time Warner Cable
UHF	Ultra high frequency. UHF designates a band range of electromagnetic waves whose frequency is between 300 MHz and 3.0 GHz.

Term	Definition
UMTS	UMTS or Universal Mobile Telecommunications System is one of the third-generation (3G) mobile phone technologies. To differentiate UMTS from rival network technologies, UMTS is sometimes marketed as 3GSM, emphasizing the combination of the 3G nature of the technology and the GSM standard which it was designed to succeed.
URL	Uniform Resource Locator
VC-1	VC-1 is the informal name of the SMPTE 421M video codec standard.
VCCLib	Virtual Channel Control Library
VCR	Videocassette Recorder.
VDSL	or VHDSL (Very High bit rate DSL) is an xDSL technology providing faster data transmission over a single twisted pair of wires.
VHF	Very high frequency. VHF is the radio frequency range from 30 MHz to 300 MHz.
VoD	Video On Demand. This service offers the same possibilities as a video rental company, where the consumer is able to pause, rewind, and fast forward a movie with the convenience of staying at home.
VoIP	Voice over Internet Protocol.
WAN	Wide Area Network.
WapTV	Interactive TV technology platform comprising a micro-browser, a mark-up language, and a significant collection of associated software tools and services.
WiBro	WiBro is a wireless broadband internet technology being developed by the Korean telecoms industry.
Wi-Fi	Wi-Fi is a brand originally licensed by the Wi-Fi Alliance® to describe the underlying technology of wireless local area networks (WLAN).
WiMAX	WiMAX is a term coined to describe standard, interoperable implementations of IEEE 802.16 wireless networks, in a rather similar way to Wi-Fi being interoperable implementations of the IEEE 802.11 Wireless LAN standard.
XBM	XBM is an ASCII monochrome image format, for storing cursor and icon bitmaps used in the X GUI. XBM files differ markedly from most image files in that they take the form of C language source files.
XML	Extensible Markup Language.
YCbCr	A family of colour spaces used in video systems.