

Ceradi

Osservatorio di Proprietà
Intellettuale, Concorrenza
e Telecomunicazioni

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Economic Affairs

Luiss
Guido Carli

SEMINAR

Standards in Telecommunications:
Competition and Innovation in
Information Industries

Please confirm participation to
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Jan. 24, 2001,
Luiss Guido Carli,
Sala delle Colonne, Viale Pola 12,
2:30 p.m. - 6:00 p.m.

*The telecommunications and information technology sectors, represent highly strategic economic domains able to effect economic progress on a global level. The rate at which the telecommunications sector develops depends heavily on the volume of information that circulates on networks, the speed of transmission of that information, and the quality and reach of its territorial spread. In this framework, the technologies of 'transmission' play a crucial role due also to the impressive speed that characterizes their evolution. On the other hand telecommunications is the sector in most dire need of standard individualization and application; the uniformity of transmission technologies is a necessary condition for reaching the best and maximum spread both for networks and for the data that circulate on them. How are the standards set? When one technology must prevail, who decides between the existing technologies, and how? Are these legitimate free market choices, or do other, less objective factors intrude? And what happens - from the view point of dynamic competition - when the emerging standard is protected by intellectual property rights belonging to a dominant firm? Can patents or copyrights on standards, while enhancing investments in innovation, become a barrier to competition? How is this dilemma to be solved? What remedies might foster a competitive drive to both innovation and social diffusion of information? **Standards and Telecommunications: Competition and Innovation in Information Industries**, offers an opportunity for reflection and inquiry into a topic for which*

Program:

2:30 p.m.

Introduction to the Seminar:

Gustavo Ghidini
Director, Osservatorio di Proprietà
Intellettuale, Concorrenza
e Telecomunicazioni

Speakers:

Robin Goldstein
President, Yale Law
& Technology Society

Ernest Miller
Fellow, Yale Law
& Technology Society

Coffee Break

Discussants:

Giovanni Cavani
Valerio De Luca (also Y.L.&T.S.)
Valeria Falce
Francesco Graziadei
Paolo Marzano
Luiss Guido Carli University, Rome

Pierluigi Sabbatini
Economist, Autorità garante
della concorrenza e del mercato

Public Debate

6.00 p.m. Cocktails

Interoperability of european digital pay tv networks: simulcrypt versus multicrypt (a case study for standardisation).

Francesco Graziadei

It is well known that as far as digital television networks are concerned, the major requirement of working out a standard making it possible to control the whole system of transmission and reception of digital television signals, by creating a fully interoperable open system (standard available at a nominal cost for anyone), led a considerable number of operators and organisations to join together as from 1993 in a project known as Digital Video Broadcasting (hereafter referred to as DVB). The aim of DVB was, taking a standard for digitalisation of the signal, to produce standards for every aspect connected with the transmission and use of the digital TV signal on whatever network this should be carried (whether satellite, cable or terrestrial digital television networks).

So that the first step was to define the DVB standard for the conversion into binary language of television signals, based on the MPEG-2 rule (a particularly efficient technology of digital compression of signals). At a second stage this progressed to a definition of the Common Scrambling Algorithm, that is to say, a common rule for the scrambling of signals. In fact, digital TV was becoming more and more a pay television and, accordingly, a fundamental function of transmission was the prior scrambling of signals, so that these could be received (that is descrambled) only by those who had subscribed to the services provider.

Then, when it came to passing on to the definition of a common standard for the Conditional Access System, the process of standardisation stopped, due to the opposition of the main pay TV providers who, instead, pressed for proprietary Conditional Access Systems. This meant the diffusion of decoders working on different standards of conditional access, each of which belonging to conditional access operators, in many cases integrated with pay TV providers.

So that, in view of this trend on the part of the main European broadcasters, what could be done to ensure the objective of giving end users the so-called single decoder, that is to say, a receiver/decoder that would permit access to all pay television offers? The need to purchase new equipment in order to have access to the competitor's offer would obviously have dissuaded a large number of users, by creating an exclusive "hunting reserve" for each digital platform.

Thus DVB had to combine the requirement of proprietary standards for the conditional access systems with the objective of bringing out the so-called single decoder by coming up with a conditional access package providing for two alternative approaches.

The first - known as simulcrypt - on the basis of the Common Scrambling Algorithm, enabled the broadcasters of every television signal to combine in the same transmission stream the data of more than one conditional access system, so that the descrambling function could be activated by any typology of decoder.

Whereas the second solution - known as multicrypt - consisted of making the decoder "neutral". More particularly the Control Access Module, containing the specifications of each operator's conditional access system, instead of being integrated in the decoder, became an external component (of small dimensions) that could be inserted into the latter by means of a standardised common interface (defined by the DVB as the Common Interface). Basically then, in the decoders adopting the Common Interface, in order to have access to competitors, it is sufficient, instead of replacing the whole decoder/receiver, to plug in a small hardware component (into which thereafter the subscriber's smart card would be inserted) provided by each pay TV platform to which the end user should subscribe.

The European Union, whose regulatory activity had waited for DVB members to reach an agreement regarding CAS standard - by means of directive 95/47 - transposed the flexible approach that DVB had finally worked out, mindful, among other things, of the errors made earlier with regard to analogue high definition TV, based on a mandatory standard, thereafter frustrated by the market's evolutions. The absence of a standardisation choice (either in terms of a Common Conditional Access System or by means of a Common Interface) was likewise vigorously reaffirmed by the E.U. Commission which opened up an Infringement of the Treaty proceeding against Spain, insofar as in transposing the directive, the latter had imposed, for the bringing out of a single decoder, the system of multicrypt alone.

In short, as spelled out thereafter by the Commission, "the directive takes a deliberately balanced position for the start-up phase of this new industry. Its requirements are sufficiently light to encourage innovation and investment in a rapidly evolving technical and commercial environment, and sufficiently strong to protect fair competition and consumer welfare".

Among its provisions, the Directive, which lays down a very basic regulation, provides that entirely digital transmissions should use a broadcasting system standardised by a recognised

European Standardisation body. In the "whereas clauses", it is thereafter specified that standardisation should bear in mind the results of the processes of search for a consensus under way between the market operators. The requirement is likewise imposed on the manufacturers of equipment that the latter should be capable of operating the descrambling of signals in accordance with the common European scrambling algorithm (according to the specifications of the recognised European standardisation bodies).

In fact the series of technical standards defined by the Joint Technical Committee EBU/ETSI/CENELEC (European Broadcasting Union, European Telecommunications Standards Institute and European Committee for Electrotechnical Standardisation) recognise and are based on the DVB standard.

Despite the enthusiastic affirmations of the E.U. Commission, referred to in the foregoing, clearly aware of the limits implied by the absence of an effective standardisation on the basis of open standards, an amendment of the European Parliament has introduced into the Directive certain safeguards against forms of vertical integration, requiring operators of conditional access services to offer other broadcasters access to their systems on a fair, reasonable and non-discriminatory condition.

Furthermore, IPR to conditional access systems must be granted to manufacturers of equipment on a fair, reasonable and non-discriminatory basis.

Member States shall provide dispute resolution procedures.

As far as Italian regulation is concerned, Law 78/99 of 29th March 1999 lays down the principle of the single decoder, understood as a concept, that is to say, as equipment that ensures the possibility of access to any digital pay television offer as well as the reception of free-to-air digital programmes. Furthermore it entrusts the Communication Authority with the task of setting up the standard for digital receivers-decoders. According to this law, the single decoder, in conformity with the standard laid down by the Authority, should have been available at the very latest by 1st July 2000.

Thereafter Decreto Legislativo 191/99 transposed directive 95/47, establishing that: digital television broadcasts shall be effected according to the DVB standard.

According to this Act; decoders shall conform to the common European scrambling algorithm and allow users to receive free-to-air television programmes. In addition, it reproduces the

precautions against forms of vertical integration between the suppliers of conditional access systems and broadcasters, as illustrated earlier with reference to directive 95/47.

The Act also provide a dispute resolution proceeding (a decision by the Communication Authority which shall be given within 90 days).

By means of resolution 216/00, the Authority, in conformity with the EU indications, lays down standards for the receiver-decoder, establishing that the single decoder should be made available both using the method of simulcrypt according to the DVB standard and using the method of multicrypt, once more according to the DVB standard. However, in the work preparatory to this resolution it was pointed out that, with reference to the satellite market only, simulcrypt would appear at short term to represent a less onerous solution, considering the large number of decoders in circulation. However, for future digital terrestrial television, stress is concentrated on the importance of the multicrypt method and that decoders should contain at least one common interface.

Furthermore, the resolution provides that the holders of IPR on conditional access systems, in granting a licence to the manufacturers of equipment shall do so without discrimination and in particular without any provision that prevents decoders from having a common interface enabling it to be used equally with different systems of conditional access and from having integrated components related to other CASs.

There are also open access type provisions (access on fair, reasonable and non discriminatory basis) to grant free-to-air broadcasters access to the Electronic Programme Guide as well as to grant access to the Application Programme Interface specifications to develop new applications.

As we have seen, none of the solutions proposed when considering DVB and thereafter EU regulations, finally goes beyond the model of proprietary standards, either with a specification standardised by the market, or by means of mandatory specifications.

It is probably possible now to attempt a preliminary assessment of the choices made and to underline any problems that these have raised or are liable to raise.

Let us briefly consider the most recent vicissitudes affecting the digital pay television market in Italy.

Initially both Stream and Telepiù (the only two Italian digital television platforms) broadcast using the Irdeto conditional access standard. It was, at that time, a widespread standard in European Countries.

Subsequently in 1997, the French Canalplus becomes the controlling shareholder of Telepiù (coming, by various stages, to hold 90% of the share capital). It immediately adopts the SECA proprietary standard and the Media Highway decoder's operative system, proprietary once more and tailored for SECA decoders. In this way part of the Telepiù subscribers, the more recent ones, become a population unreachable by the competitor (without the user being required to bear the costs of two different decoders).

In this phase Stream, which has no proprietary standard, indicates its interest in the neutral decoder according to the multicrypt solution, whereas Telepiù presses for simulcrypt.

Thereafter Rupert Murdoch (News Corporation) enters into Stream as a joint controlling party and suddenly introduces the NDS proprietary CAS standard, used by him earlier for his pay broadcasting televisions.

At this point Stream too begins to favour simulcrypt.

In actual fact both pay TVs operate simulcrypt transmission in order to ensure that both the old and new customers can be reached by their signal.

However the trend is to write off the old Irdeto standard in order to progressively affirm the proprietary standard over all customers. For instance, certain innovative services (such as pay per view) are broadcast by Telepiù in SECA only, whilst the older subscribers are offered the free hire of a new SECA decoder.

The "official reason is that the API of IRDETO set top boxes is unable to deal with such services but someone claim that this could overcome by a remote software downloading.

However, as has been clearly seen, from 1st July 2000 onwards the law permits the marketing exclusively of decoders capable of receiving all available offers (single decoder). Accordingly by that dead line the present operators should have reached an agreement either to bring out a decoder having a common interface in accordance with multicrypt, or else to begin broadcasting using both standards in accordance with the simulcrypt model.

Notwithstanding the terms imposed by the law, such an agreement was only reached at the end of November last (that will cost the broadcasters heavy sanctions by the Authority) and - opting for the simulcrypt solution - providing that broadcasts using both codes (NDS and SECA) begin only as from March next. The plan for Telepiù seems to be the suspension of its broadcasts in Irdeto after March, whereas Stream seems to be intended to continue to broadcast in Irdeto

even after March. So that - and it is here that the simulcrypt solution immediately reveals its limits - the Irdeto decoders already in circulation probably will be not be single decoders, since they will not permit reception of the Telepiù programmes.

If a preliminary assessment can be made, this is that the choice of foregoing any standardisation of crucial aspects of the digital television networks has not "clipped the wings" of technological evolution, but has however created a strongly fragmented market based on closed and non-interoperable systems, with the risk that time will expand this fragmentation in downstream markets.

These are all concerns well known to the Italian Communication Authority itself that, in its resolution on standards for decoders, affirms that it reserves the right of assessing in future whether decoders with proprietary software imply a restriction to the development of a market of interactive multimedia applications (*so MHP an multicrypt*), even not strictly referring to the television market, and that the regulatory framework will be revised where technical evolution should provide solutions for the development of television and multimedia services based on open standards, bearing in mind among other things the progress made regarding DVB. It should be underline that as from December 1997, DVB has been working on the specifications for the standardisation of a Multimedia Home Platform, capable of running applications on advanced set top boxes, TV sets and multimedia Personal Computers for digital broadcasting.