

IPRs and Interoperability in EU Digital TV: Economics and Policy issues¹

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ABSTRACT

The quest for interoperability of interactive TV has been a major concern of the EU Institutions. Its policy foundations were built on the enabling role of open standards, whose peculiar standardization process should guarantee affordable and widespread IPRs availability. After having received considerable public support and financial funds, the ITV roll-out appears disappointing, and the diffusion of the main concerned standard, the MHP, stagnates.

We conduct a comprehensive analysis of the main markets facts and passages of the ITV policy, to derive a multifaceted assessment of its technological, economic and institutional drivers. Several important issues stand out. Beside the inner complexity of the policy, a few normative inconsistencies and conflicting aims adversely impacted its feasibility. Several logical ambiguities also dampened the correct choice of instruments. In particular, the existing literature clarifies two main points: open standards cannot be uncritically assimilated to open source software, and the role of open standards along the broadcasting value chain is largely unexplored. Consequently, their effects here might differ from those experienced in traditional ICT markets. Finally, the focus on the Italian case presents a paradigmatic example of inconsistent policy implementation and regulatory capture of the EU policy-maker.

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1. Introduction

The quest for technical interoperability of Information and Communication Technologies (henceforth, ICTs) has been a major concern of the EU Law and policy-making. As interoperability caters for both scale and network externalities, and enlarges consumer choice, it also fosters ICTs diffusion and enables the full exploitation of their potential. Mostly, interoperability is achieved with the implementation of standards, either *de facto* or *de jure*, the most important type being interface standards. However, some of these standards may qualify as “Trojan horses”, since they embed “essential” Intellectual Property Rights (henceforth, IPRs) which may eventually lead to the same degree of market power and consumer “lock-in” which is associated to successful proprietary and non-interoperable solutions. At the same time, the role of IPRs cannot be neglected and they should be guaranteed fair institutional protection, to preserve economic incentives for investment and further innovation.

What is more dubious, is whether the traditional legal monopoly regime, as granted by copyrights and patents, still qualifies as the most appropriate instrument to develop the Information

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Society. Likewise, the possibility to frame new IPR tools and business models that cater for both private incentives and the public interest remains largely unexplored. So far, this debate has been mainly confined to the software industry, where innovative “free” or “open” business models have emerged: the Open Source Software movement (henceforth, OSS) is the main example of the search for a new IPR paradigm, conjugating investment incentive and interoperability. Also the EU Institutions’ Agenda has been recently influenced by this movement to “open” solutions, in different domains².

A similar approach has also been adopted in new digital communication platforms, such as 3rd generation mobile communication (so called UMTS) and digital TV (henceforth, DTV), on the belief that these platforms could play a fundamental role in providing universal access to the Internet and its interactive services, especially for those citizens with low ICT skills prevented from traditional computer usage. Consequently, the EU Institutions have put strong emphasis and resources to promote the interoperability of interactive services through open standards. However, in UMTS and DTV markets the feasibility of “open” standards, “newer” IPRs and “free” business models remains largely unknown, and the debate among practitioners and policy-makers is often affected by ambiguities, starting from the very definitions of “interoperability” and standard “openness”.

As a matter of fact, after several years of policy implementations, the market evidence on the Interactive TV (henceforth, ITV) in EU appears rather disappointing, and points to a few policy inconsistencies, the main element being the very possibility to transpose the “openness” criterion to a different and possibly incompatible domain – that of DTV. Moreover, in a few member states the actual implementation received by the ITV policy features national aid measures that collide with the fundamental principles of technological neutrality and market orientation, thereby engendering excessive distortion of competition and trade. In short, these shortcomings might directly impinge on the coherence and the effective functioning of the New Regulatory Framework.

The present paper provides a comprehensive discussion of the main stylised facts, on the basis of the theoretical literature. In particular, an attempt is made to deepen our understanding of open standards and their applicability to the DTV value chain; likewise, it examines the feasibility of the EU project of stimulating ITV interoperability through open standards. Section 2 reviews the themes of new IPRs, standardization and interoperability in DTV, with respect to the other ICT industries. Section 3 analyses the EU policy on ITV, illustrating its achievements and pitfalls. Section 4 presents a comprehensive analysis of the MHP, and its contentious implementation in Italy, which provides an illuminating example of the complexity and potential inconsistencies of the EU ITV policy. Section 5 concludes, pointing to a few implications for the research agenda.

2. Interoperability and Digital TV

This section shows why, on overall, interactivity and interoperability prove more difficult to be achieved on digital TV platforms and highlights why, in any case, they feature original elements and higher degrees of complexity once they need to be declined to the broadcasting and media realms, with respect to the “traditional” ICT world (computers and Internet). Before doing this exam, we briefly review the large literature existing on standardization and interoperability, to focus on the more recent topic of “open standards” (section 2.1). Later, in section 2.2, we first describe in an essential and “not-too technical” way the technologies and the main operations performed along the TV value chains, and the role played by standards, IPRs and interoperability. Further, with specific reference to ITV, different meanings of interoperability and the scope for “open standard” are discussed.

² In the EU antitrust policy the recent developments on the Microsoft case confirm the EU attitude towards interoperability. In the policy for the Information Society, EU and national E-Government plans are increasingly based on OSS solutions.

2.1 Interoperability and standardization: a brief survey of the literature.

Interoperability can be literally defined as the ability to “work together” or, more generally, as the property of being compatible with something else. When the term is used in the ICT and media industries, one mainly focuses on the property of a electronic device (or a piece of software) of exchanging information and effectively processing it according to predefined specific purposes. Moreover, in network industries the interoperability of services is an accompanying property of network interconnection. Conventionally, interoperability is assumed to be two-way, although also one-way interoperability can be relevant.

Standards (both *de facto* and *de jure*)³ are the most usual and straightforward instrument to achieve interoperability, although this is neither sufficient nor necessary⁴. Today’s burgeoning diffusion of ICT and Internet is indeed rooted on intensive usage of standards. However, an interesting and apparently conflicting tendency is also the proliferation of Standard Setting Organizations (henceforth SSOs) which, beside formal standardization bodies (in EU: CEN, CENELEC and ETSI), increasingly feature as initial actors or “proponents”: main examples are industrial consortia and fora. These proponents are usually oriented to specific standardization initiatives, and cease after completion of their mandate⁵.

A particular class of standards mostly relevant for our analytical purposes are “interface” standards, which enable interoperability between two or more complementary components, building together a systemic good. Interface standards generally benefit consumers, since they allow competition between components, instead of between complete systems. However, several cases also show that interface standards equally cater for anticompetitive strategies (see Mackie-Mason and Netz, 2007), especially when SSOs or dominant firms manage to collude with IPR holders located on both sides of the system, and to influence the standard setting process accordingly. Now, standards for API (discussed *infra*) possess several characteristics of interface standards.

A large literature has explored the topic of the economics of standardization and interoperability, both theoretically and empirically (among the reviews, David and Greenstein, 1990, Matutes and Regibeau, 1996 and Blind, 2004). Basically, this literature (contiguously to that on technology diffusion and path dependence, see Arthur, 2004) has demonstrated that the principal role of standards is to provide for scale and network economies, although at the cost of reducing the variety of alternative incompatible technologies⁶. This outcome is not always optimal in terms of social welfare, especially when we introduce a dynamic setting of analysis. In fact, if there are strong network effects reinforcing the first technology/standard to arrive on the market, premature standardization might irreversibly displace future superior alternatives (Besen and Farrell 1994, Liebowitz and Margolis, 1996).

On overall, while the standards’ economic function is generally considered positive - at least in terms of static efficiency - the best procedural way to create sound and efficient standards is more dubious, since several cases show that the market-driven races for standardization (also, “standard

³ “De facto” standards, despite being widely accepted and used in the market, are technical specifications which did not undergo a procedurally formalised and consensus-driven process of adoption, carried out by a formally recognised standardization body: the latter is the case of “de jure” standards. *De jure* standards are increasingly promoted by consortia and fora, which eventually submit the developed specification for approval to the concerned formal standardization body.

⁴ In fact, complementary measures should be ensured: interoperability testing, reference implementations, technical assistance services and troubleshooting. “Ad-hoc” converters - either voluntary or mandatory - can provide an alternative path to interoperability; however, contrary to standards, they involve some loss in terms of time or quality of the resulting communication. Often, in practice, the distinction between a standard and a converter is fading away. Other less compelling variants are industry documents or guidelines for voluntary interoperability.

⁵ The DVB consortium is a notable exception: initially created to develop standards for digital broadcasting transmission, its lifetime has later been extended to cover additional areas, as API standardization (see *infra*).

⁶ The degree and the pervasiveness of technology standardization can vary. If the standardization is limited to an interface element, it leaves a higher degree of technological freedom and variety in the interconnected components, with respect to a systemic and complex standard.

wars”) might provide society with inferior alternatives. In principle, policy-makers should critically evaluate the market’s ability to efficiently choose between technological standards, both for quality and timeliness; in fact, spontaneous market acceptance of standards could result either too slow or too fast (see Stango, 2004). This possible outcome, in principle, could justify the opinion that *de facto* market standards are inferior to *de jure* standards.

On the other side, other factors (the difficulty of technological forecasting, the asymmetries of information, the role of industry lobbying and regulatory capture) might also alter the policy-maker’s ability to select between competing alternatives. As a result, a “third way” has emerged, and SSOs – both traditional and new ones, such as consortia and fora – have been experimenting participatory, consensus-driven and open standardization processes - mediated in some way by the market; a few papers have explored the role and functions of SSOs (Funk and Methe, 2001, Greenstein and Stango, 2007), and their procedures. In this literature, studies addressing simple or “stand alone” standards have been predominant, while joint, multiple or systemic standards have been paid less attention. However, when dealing with ICTs, systemic technologies and standards play a more prominent role, so that the literature suffers from a certain gap between theory and applications (among the few studies, a recent one applied to the GSM standardization is Bekkers et al., 2002).

Standards inevitably embody pieces of knowledge, which is typically associated with IPRs: patents and copyrights are the two main examples involved, and one standard may contain several IPRs, some of which might be “essential” in order to market a well-functioning or affordable implementation. However, standards and their governance should not be confused with that of the associated IPRs, although the two dimensions substantially overlap. A similar caveat should be stated when analysing the building blocks of a standard: both hardware and software components can be involved, together with their associated IPRs. At the same time, selected hardware and software ICT components may be based themselves on standards. So, several intertwined and recursive linkages can occur between a standard, its basic components (potentially including other standards) and the associated IPRs.

These distinctions become relevant when we go to analyse the recent quest for interoperability through “open standards” in DTV, which we compare to the similar move towards “free” and “open” software (primarily, the OSS movement).

To better appreciate their similarities and differences, we need to define first what “open standards” mean, with reference to technology. Different and partly overlapping definitions have affirmed in the business and standardization world, and this indeterminacy has been affecting so far also the literature: unfortunately, there is no “standard” definition of an “open standard”.

Conventionally, an “open” solution is contrasted with a “closed” or “proprietary” one, in a dichotomous logic stressing the larger base of subjects involved in the development of the former. Here, stakeholders usually acts in a consensus-based process, while proprietary standards are characterised by a less pluralistic and self-referential subjects base (typically, an individual firm, or a closed consortium), that acts according to autarchic decision rules. Moreover, the concept of “openness” of a standard is many-sided, and consequently needs a multidimensional metrics (see West, 2003). Krechmer (2006) emphasises that ICT standards are increasingly controlled by standard implementers, rather than standard creators, and that the fulfilment of the many dimensions of openness (ten!) should be verified across three subjects: creators, implementers and users⁷.

As a consequence, if we want to force a dichotomous (but superficial) definition, we may define a standard as open if its detailed technical specification is publicly available, since it has

⁷ According to Krechmer (2006), criteria such as “open meeting”, “consensus” and “due process” pertain to the creator, while those of “one word” and “open IPR” are equally shared across the three subjects. “Open documents”, “open change”, “open interface” and “open use” equally concern implementers and users, while the user is also interested in “on-going support”.

been released by its legitimate owner or sponsor, and made available for interested third parties⁸. However, this definition remains practically undetermined, since the property of “availability” needs to be further specified. Among the most important dimensions, the following are chiefly important (see West, 2003): the subjectivity of the third parties legitimated to the access (in a continuum spanning from the producers of complementary goods to the most direct competitors of the standard owner), the actual content and the pervasiveness of the rights made publicly available (concerning only the basic original specification of the standard, or also its derivative implementations, or even the rights of modification of the standard and its implementations); last – but, we believe, not least – the financial terms of its IPR licensing scheme chiefly matter.

Concerning the financial terms of licensing, according to the prevalent definition, an open standard is not necessarily a free standard. In fact, although in principle the relevant IPRs of an open standard can be made publicly available at no charge (in this case, the similarity between open standard and free software would be maximal), the minimal necessary financial requisite for being an open standard is to offer FRAND (fair, reasonable and non discriminatory) terms of licensing.

However, FRAND terms do not necessarily imply a small royalty or fee, since the latter should be aligned and proportionate to the “importance” of the concerned open standard, somehow determined (technical complexity, R&D costs embedded, inventive leap, etc.). As a consequence, some commentators believe that FRAND licensing commitments are insufficient, especially when multiple essential patents are involved, so that the cumulative royalty to be paid becomes unbearable (for a negative position, see Geradin, 2006). More radically, other authors point to the conflicting plurality of criteria currently implementing FRAND obligations, and to the practical indeterminacy involved in most of them (see Treacy and Lawrance, 2008)

At the same time, the openness criterion may prove temporally unstable. In fact, standards naturally evolve because of technical change, and so do open ones. Moreover, the latter suffer an higher risk of falling prey of stakeholders’ “enclosure strategies”, for which third parties do not possess significant remedies. Consequently, an initially open standard can evolve into a series of semi-open or even proprietary implementations, which might undermine its initial degree of interoperability and turn it into a *de facto* closed standard⁹.

On the contrary, the OSS movement maintains a stronger emphasis on ensuring interoperability between specifications and derivative works, while being less demanding in terms of economic remuneration. A main example is given by the General Public License (GPL, henceforth), which is very restrictive concerning the right of developing derivative works¹⁰, while being free in terms of economic conditions.

To conclude, although the open nature of a standard in principle ensures a higher potential for interoperability, this property is neither sufficient nor persistent; moreover, to be maintained up to the user level, interoperability requires strong IPRs leadership by the concerned SSO, which is however conducive to market dominance and hence abuses. As such, it seems to require some sort of accompanying “public” regulatory enforcement. Further, the economic profile of open standards needs to be attentively scrutinised, especially for complex standards and products, since the financial terms of licensing can result economically unsustainable.

In any case, this short comparison highlights that any direct analogy between open standards and the OSS is potentially misleading. Most of these ambiguities and criticalities have affected the EU experience with the MHP standard.

⁸ However, this definition does not seem to differ significantly from the conventional definition of a *de jure* standard, as stated by the ISO/IEC Guide, Version 1996/2: “Document, established by consensus and approved by a recognised body, that provides, for common and repeated use, guidelines, or definitions of characteristics, for activities or their results, aimed at the achievement of the optimum degree of order in a given context” .

⁹ The software industry provides a number of examples of these enclosure strategies (see Shapiro and Varian, 1999).

¹⁰ In fact, the GPL forbids the possibility of modifying the original source code in a way that the new implementation loses some degree of interoperability with the previous OSS applications.

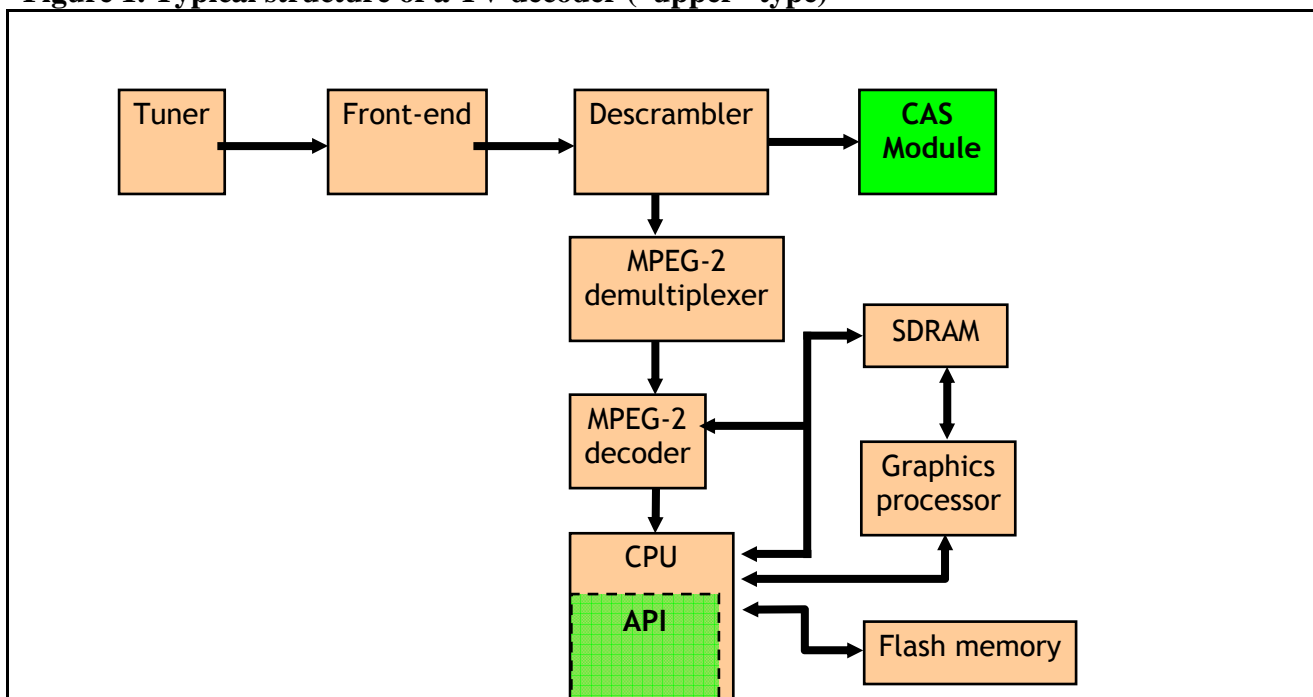
2.2 Interoperability and standards along the DTV value chain

The communication infrastructure and devices supporting traditional audiovisual (or TV) services can be stylised in two main components, whose exact typology and topology is technology and platform-variant¹¹. On one side, we have the transmission network, which broadcasts (or narrowcasts, as in the Video on demand - henceforth VOD) the content up to the consumer's premises. On the other side, at the household level is located the consumer's reception equipment, by which the signal is decoded and eventually displayed on the TV set. Concerning the reception equipment, two main alternatives exist for traditional TV-based reception¹²: the analogue TV set, combined with a digital decoder (or *set top box*), and the more recent integrated digital TV set (therefore IDTV), including a digital tuner: these two solutions imply different usage properties, and also specific business strategies and policy implications.

The decoder solution has been the first to be implemented, since the launch of the analogue pay-TV in the mid-Nineties. The main advantage of a separate box is its flexibility to accommodate other complex and potentially obsolescent components: in fact, in the pay-TV business model, the decoder embeds the Conditional Access System module (henceforth, CAS), which authorises the household's access to the platform and feeds the TV set with a decrypted audio-visual signal.

Nowadays, EU markets display two main typologies of TV digital decoder: a simpler one (also called "zapper"), suitable for free to air (henceforth, FTA) digital services, is basically composed of a digital tuner and an EPG¹³; a more complex type ("upper", see figure 1) contains other modules, which enable more elaborate computing functions.

Figure 1. Typical structure of a TV decoder ("upper" type)



Source: Adapted from www.webinteractivetv.org

¹¹ In fact, it varies according to the analogue or digital nature of the technology, and to the different platforms, wire line or wireless: coaxial cable, fibre optic, ADSL, satellite, terrestrial (UHF and VHF) and microwaves are the main examples.

¹² In the PC-based TV reception (not to be confused with the Internet TV), the signal is received via an external plug-in tuner (typical in terrestrial TV) and other apparatuses, connected to the PC motherboard (such as the external dish in satellite TV).

¹³ The *electronic programme guide* is a close equivalent of the browser in the Internet world.

This upper type of decoder contains a fundamental component, the API (*application program interface*), which is a software layer managing its more complex functions and applications¹⁴: for example, it enables “two-way” communications - as in the case of truly interactive services (home banking or E-government) - and coordinates through the CAS module the pay-TV operations (subscriber authorization, purchase of TV events, etc.). On overall, the API coordinates and manages the informative fluxes from and to the decoder, providing external software applications with a compatible interface. Once the API is standardised, it enables the portability of content and applications across different types of decoders, since they do not need to be re-authored to fit each system. In short, when the API interface is standardised, its leverage effect is magnified and it enables the emergence of horizontal markets, which in turn enable economies of scale and – hopefully - affordable decoders’ price.

Due to strategic and secrecy reasons, CAS and API modules have been initially developed as “proprietary” systems, partly protected by industrial secrets and partly by restrained IPRs. In these cases, these modules can be rendered interoperable with “third party” solutions only after “ad hoc” technical configurations and release of relevant source code – accompanied by discretionary IPR licensing agreements (see table 1).

Table 1. Main differences between proprietary and open APIs for DTV decoders

	Proprietary API	Open API
Domain	Typical in pay TV (satellite or cable)	Typical in FTA TV (terrestrial)
Property	Designed, owned and managed by one single company.	Standardised by an official SSO, often promoted by hybrid subjects (eg: DVB for the MHP).
Licensing	Actual availability for third party implementers may vary. Licensed on discretionary terms.	Publicly available without subject restrictions. Licensed on FRAND terms.
Examples	MediaHighway (Canal+ group), OpenTV, Liberate, Microsoft TV, NDS (News Corp. group), PowerTV.	MHP (based on Java) (Italy); MHEG-5 (UK), OCAP (cable TV in US, based on MHP), JavaTV.

Source: Our elaboration on www.webinteractivetv.org

However, these IPRs might also lead to market dominance and its possible abuse. Sometimes, the actual ways in which dominant firms manage their IPRs go beyond the legitimate interest of exploiting the associated monopoly rents or preventing piracy, and might also qualify as anticompetitive conduct (typically, in the form of discriminatory conduct or refusal to deal)¹⁵.

The oligopoly theory has convincingly showed that, especially in network industries, strategies based on proprietary IPRs and incompatibility can embed a powerful leverage and strategic effect, since they might rise consumer’ switching costs to such an extent that the competitive tension in the market is substantially sterilised¹⁶. In this case, consumers cannot change their current communication platform, and new competitors are defeated by the network effects, so that even an efficient entrant is foreclosed. When this happens, market shares appear highly inertial, or even tend to further concentration (in a “winner takes all” way - see, among the others, the reviews of Katz and Shapiro, 1994 or Gandal, 2002).

These stylizations explain well the business facts regarding TV decoders and platforms,

¹⁴ Beside the API, these additional functions require other complex hardware components (CPU, memory, etc.), with respect to the FTA zapper.

¹⁵ In US, these cases have often found an antitrust fix in the “essential facility doctrine”, abundantly extended to the new technological fields covered by IPR. In EU its application has been more parsimonious, and in general dubious.

¹⁶ Moreover, in media markets the strategic leverage and externality effect stemming from the incompatibility of the platform can be reinforced by the indirect network externality associated to the content layer, where premium content strategies and exclusive licensing clauses reinforce any platform-related first mover advantage.

mainly in the case of vertically-integrated broadcasters - typical in the more concentrated pay-TV market. Here, most of the times the strategic intention underlying a firm's denial of "third party" access to its own proprietary platform (for example, to its CAS module) is that of excluding rivals not just from the hardware layer, but mostly from the supply of broadcasting services. In this case, if the new entrant's quest for interoperability with the incumbent platform is not answered (for example, either with a converter or the licensing of the dominant platform's IPRs), the new entrant is vertically foreclosed.

At the same time, it is also true that the incentives to interoperability depend on the competitor nature: once the fringe manages to obtain access to the incumbent's platform and succeeds in acquiring a sizable base of customers, it would probably convert to the same "walled garden" model - this is the so-called "time-inconsistency" of the compatibility choice (see Besen and Farrel, 1994).

Again, media markets, with respect to traditional ICT ones, present a more complex structure of incentives to compatibility, since broadcasters display a larger set of strategic moves and business models. For example, face to the increasing digital audience fragmentation, broadcasters may consider profitable to extend their presence across multiple platforms, both traditional and new ones - the current move towards Internet TV is a case in point. Moreover, broadcasters may adopt multiple business models - pay, FTA and mixed - which again add complexity to the stylised predictions on interoperability derived from traditional telecom markets.

On overall, market evidence seems to suggest that the defence of a proprietary and non-interoperable solution stands as an eligible strategy for *incumbent* and pay-TV operators, while the reverse seems to hold for new entrants and FTA TV operators.

3. EU policies for ITV interoperability

3.1 Introduction

The current UE policy for the Information Society, as today synthesised in the New Regulatory Framework (henceforth, NRF) and in supranational and national sources¹⁷, stylises the EU industries providing electronic communications in two main segments, infrastructure and content; with reference to infrastructure, the policy (mainly within the NRF) is based on a few fundamental principles, including market liberalization, progressive substitution of antitrust for regulation, technological neutrality and market-oriented policy-making. Technological neutrality, in its basic flavour, says that the policy-maker should impose the same rules for the same services, irrespective of the underlying electronic communication platforms: as such, the NRF aims at unifying diverging TLC, Internet and Broadcasting regulations. Market-oriented policy-making comes out of the reflection on the past errors of dirigisme¹⁸, and acknowledges the intrinsic difficulties of technological forecasting, the information asymmetries and the systemic nature of technological policies.

Consequently, for the regulation of infrastructure, the EU policy-maker now envisages a decision-making process driven by market developments and open to the consultation of different stakeholders, including industry, academic and consumers representatives. The goal is to frame a neutral and market driven regulation, which "assigns to the market" the task of selecting the best technological solutions, without distorting spontaneous competition.

A few regulatory measures are provided for, to prevent that market power dampen emerging competition; moreover, these "ex ante" measures are set as temporary, and must be replaced by "ex-

¹⁷ These sources, mainly regarding content regulation, are various. At the EU level, a main example is the recent Directive on "Audiovisual services without frontiers", approved at the end of 2007.

¹⁸ The main example being the case of the EU support to the expensive MAC project, the selected standard for analogue High Definition TV, during the Early-Nineties. It was later abandoned by market players, face to the prospective more promising development of its digital version.

post” antitrust law, as soon as market competition unfolds¹⁹.

At the same time, content issues are covered by supranational (for example, the “Audiovisual services without frontiers” Directive) and national legislation, in accordance with the principle of subsidiarity of the EU Treaty, which first reserves competence on content and cultural policies for member states (see Art.5 of the UE Treaty, as amended by the Treaty of Amsterdam).

However, a few regulatory inconsistencies may arise from the NRF formulation and implementation. In principle, the NRF should only address the regulation of communication infrastructure – including that for TV transmission - while previous broadcasting regulation was deeply intertwined between content and infrastructure. This separation, when going into the details, is not always clear nor predictable, because content and associated IPRs are increasingly linked to their technological support and transmission infrastructure. As a consequence, while most of the content issues receive a separate treatment from separate EU Law bodies, a few neighbouring items are also covered by the NRF, which is based on different principles and structures of enforcement.

One main example of shared regulation are the NRF provisions for the interoperability of DTV interactive services, which lie at the intersection of the (previously separated) TLC and broadcasting industries. Basically, according to Art. 18 of the Framework Directive, a DTV interactive service (be it a quiz, a poll or an e-Government service) should be accessible without platform or service limitations, to promote the free flow of information, media pluralism and cultural diversity.

Concerning its enforcement, the Framework Directive prescribes a regime of decentralised support to be offered by member states (see Art. 18 (1) and (2)); only if these measures prove to be insufficient, the Commission must use a procedure similar to that generally aimed at ensuring interoperability of communication networks (ex Art. 17), eventually leading to mandatory adoption of standards by the Commission – as a “last resort” solution²⁰.

This complex and decentralised enforcement structure is clearly prone to failure and potential member states’ abuses.

3.2 Interoperability and API

The basic idea of Interactive TV (henceforth, ITV) dates back to the second half of the Nineties. Face to the increasing popularity of the Internet and its consequent boom at the end of that decade, TV operators – mainly FTA broadcasters and consumer electronics (henceforth, CE) manufacturers - started to figure out new ways of delivering TV services, featuring interactivity and additional services; this would have revived mature and stagnating FTA markets. At the same time, the introduction of digital pay-TV had urged a new generation of APIs, which gradually enabled new transactional functions within the decoder.

These favourable techno-economic prospects spurred the Digital Video Broadcasting (henceforth, DVB) consortium into action, which embarked in the Multimedia Home Platform (henceforth, MHP) project since 1996; however, at that time DVB membership did not include major IT and API specialists, so that the original MHP project built around the idea of a low-cost presentation API based on the MHEG-5 specification²¹. Coherently with this idea, various European (mainly public) broadcasters started to politically advocate the need of a EU-wide move towards

¹⁹ To ensure a smooth transition, these regulations build on the same principles of antitrust law: first, an assessment of market power of incumbent operators is carried out; second, if significant market power (SMP) is found, transitory remedies are imposed, such as “third party” regulated access to incumbent’s networks and associated facilities.

²⁰ In fact, Art. 17 says that the Commission establishes a list of standards whose use should be encouraged by member states, to the minimum necessary to achieve interoperability of digital communication networks and services (Art. 17.2). Only if the “suggested” list of standards is not correctly implemented, and as a result interoperability of networks or services in one or more member states has not been achieved, the Commission might intervene to order the compulsory implementation of these standards (Art. 17.3).

²¹ MHEG-5 was already diffused as a presentation engine. Later on, before becoming an European standard listed in the Official Journal, it attained the ISO standard certification.

one unique standardised API that, contrary to most of the existing proprietary and incompatible APIs, should not have been controlled by one vertically-integrated operator, but left “open” and publicly available for potential implementers.

When in mid-2000 MHP was first released, the Internet bubble was about to burst and soon ITV and media markets conditions would have appeared far less attractive. At that time, DVB membership had been enlarged to new operators, and also the MHP project had become more articulated. In particular, MHP had been reoriented toward a more complex execution engine based on the Java “virtual machine”, a technology developed by Sun for Internet, which offers a high standard of security for on-line transactional applications (such as e-commerce or e-banking).

On one side, MHP advocates continued their efforts with a view to the incoming approval of the NRF. MHP supporters were mostly Scandinavian TV operators and German broadcasters (while German cable operators remained rather sceptical), together with major CE manufacturers. On the other side, pay-TV operators (and most of EU cable TV providers) did not share the need of a new “open” standard such as MHP, on the ground of its economic effectiveness (too costly for its prospective expected benefits) and the perceived lack of consumer interest on ITV. Similarly, at that time the interest for MHP was also geographically differentiated: on one side, Scandinavian countries, Benelux and Germany were in general supportive (due to their analogue TV legacy and the larger potential for digital TV take-off); on the other side, most of the larger countries (UK, France, Italy, Spain) were opposed, or alternatively were just favouring a long-term migration strategy to MHP, while maintaining compatibility with existing proprietary APIs and remaining open to alternative future specifications (see CENELEC, 2003). Concerning alternatives, both in UK and France there was a strong preference for the simpler MHEG-5; more generally, the preference for a standardised but simpler presentation API was held by several European cable operators, which were primarily concerned by the additional cost burdens and the technical immaturity of MHP (see ECCA, 2003; p. 3).

The final draft of the NRF incorporates a sort of compromise between these diverging views on open API standardization as mean to achieve interoperability. In particular, Art. 18 of the Framework Directive – later added to the Commission’s draft by the European Parliament - does assign a special status to open API, and indirectly to the underlying MHP specification, which was the first to be formally acknowledged in the list of standards published in the EU Official Journal.

Moreover, and even more important, Art. 18 reflects a complex policy-mix of objectives, since it both addresses infrastructure and content regulation, while the latter is normally out of the scope of the NRF. In fact, Art. 18 both mentions interoperability (as a mean to achieve horizontal markets, and hence infrastructure competition) and socio-political and cultural goals. In detail, Art. 18(1) of the Framework Directive prescribes that, in order to promote the free flow of information, media pluralism and cultural diversity, the member states encourage:

- a) suppliers of interactive DTV services to use an open API
- b) suppliers of DTV devices (decoders) able to receive interactive DTV services to conform to the open API, and to its minimum interoperability requirements.

Art. 18(2) adds that member states also encourage all proprietors of existing API (both open and proprietary) to make available on FRAND terms (including adequate remuneration) all the information necessary to enable suppliers of interactive DTV services to offer all the API-supported applications in a fully functional manner. Finally, Art. 18(3) says that the Commission, one year after entry into force of the Directive, evaluates the actual effects of Art. 18 and, if interoperability and freedom of choice have not been reached in one or more member states, may mandate the compulsory adoption of an official standard (following the general procedure contemplated by Art.17).

This complex policy-mix has been later specified in a series of Commission documents, aimed at disentangling the implementation guidelines of such a difficult political compromise.

A first document stressing the move to open standards for multiplatform interoperability is EC (2003), where the Commission focuses on the reduction of barriers that prevent widespread access to new communication services and applications - in particular those provided over DTV and 3G mobile platforms. The underlying belief is that these platforms, having achieved a mass-level and quasi-universal diffusion, can play a fundamental role in providing generalized access to the Internet and its interactive services, especially for those citizens with low ICT skills prevented from conventional computer usage. As a result, the Commission envisages a multiplatform approach to the delivery of Information Society services, where mobile and DTV platforms complement traditional PC-mediated Internet access. Correctly, the Commission recognises that, due to the inner diversity of the concerned industries, operators and business models, standardization and interoperability for API mean different things and contemplate diverging strategies, so that a “wait and see” approach was preferred at that time²².

One year later, at mid-2004, the Commission is called to review the status of API interoperability, and decide on the implementation of the provisions of Art. 18(3) of the Framework Directive.

Preliminarily, studies, bilateral hearings and public consultations were launched to prepare this assessment. A crucial conclusion of the CENELEC (2003) report was that a common EU-wide standardization strategy was unfeasible, and that different paths for achieving interoperability were needed in different EU countries.

This basic point was also recognised by a Commission staff working paper (see EC, 2004a), which provides an illuminating account of the plurality of stakeholders and the inner complexity of the EU policy for API interoperability. First, the Commission services were dwelling on the occurrence of a paradigmatic shift in interoperability, moving from the analogue to the digital era. In fact, while in the world of analogue TV interoperability was technically simpler, since it could be based on a technologically stable reception set connected to one main transmission network, nowadays multiple digital networks and fast evolving reception devices (whose intelligence is increasingly software-based) ravel the achievement of interoperability via a series of common technical specifications.

Second, EC (2004a) picks up the CENELEC (2003) argument that a multi-layer strategy was needed to meet the diversity of EU communication markets, and recalls CENELEC’s analysis on further and complementary standardization initiatives (on re-authoring and simpler presentation APIs) useful to achieve interoperability in legacy API markets. In particular, the possibility to achieve interoperability at the content level (with a portable content format, such as PCF) - rather than at the receiver/network level via a technical standard for API - was given a stronger emphasis.

Finally, EC (2004a) correctly identifies some potential policy trade-offs and sources of regulatory inconsistencies, although it does not explore them fully. In fact, on one side it correctly notices that, while the construction of the EU common market and the ensuing scale economies require a supranational policy, EU broadcasting regulation remains subject to the subsidiarity principle of the EU Treaty, that authorises the Commission to intervene only when national policies are inadequate or insufficient. On the other side, EC (2004a) falls short of exploring other crucial goals underpinning the quest for API interoperability, those implied by global standards races and trade policy: concerning the first, EU strives for establishing its own standards face to the US and Asian competitors, while trade policy foresees early and strategic standardization as a main tool of intervention. Putting priority on these international issues inevitably reduces scope and degrees of freedom for diverging member states policies, and – above all – for technologically neutral approaches. Likewise, while standardization and trade policies usually build on the consolidation of

²² Likewise, the Commission recognises that initial and emerging markets require time to reach interoperability, which prove particularly difficult for new and advanced services. It explicitly mentions a sort of “technological life cycle” for interoperability: first, a new technology is introduced by proprietary solutions, to become later standardized and interoperable as soon as it matures, either spontaneously or by direct regulation.

a few big “European champions”, this outcome conflicts with market competition and media pluralism.

The responses to the public consultation on EC (2004a) highlight how ITV stakeholders – even those within DVB - deeply differed in their perceptions and interests about API interoperability and the necessity of its mandatory standardization on MHP. Moreover, a few crucial points raised by the Commission about the respective role of market forces and public authorities towards ensuring interoperability over the technological life-cycle of ITV (see EC, 2004a; pp.27-28) remained basically unmet.

In detail, the position of European Broadcasters Union (see EBU, 2004) appeared the most straightforward. It claimed that, although there could be different types of interoperability, the focus of the normative should be maintained on European citizens, and interoperability defined as their possibility to access the full range of available ITV services, offered in a competitive arena. While recognising the potential utility of PCF and other alternatives (such as content re-authoring or broadcasting in multiple formats), EBU pointed out clearly that only open standards (not limited to MHP, but also extending to other simpler solutions, such as MHEG-5) guarantees “citizen-level” interoperability. Moreover, EBU warned the Commission against a minimalist approach bound to ensure interoperability solely within the digital terrestrial (henceforth, DTT) platform (as suggested by its predominantly national regulation), on the grounds that interoperability limitations significantly affect also satellite and cable. Then, a series of suggestions was spelled out, regarding how to implement Artt. 17(3) and 18 of the Framework Directive: sunset dates by which only API systems would be allowed, recommendation of MHP for “green field” markets and new ITV platforms, and obligations aimed at guaranteeing the public release of service information and source code.

On the other side, operators coming from the pay-TV, TLC and IT worlds showed a more liberal and market-oriented attitude to interoperability, claiming that publicly-mandated standardization would have chilled private innovative efforts – in particular those aimed at introducing early proprietary solutions to address perceived market opportunities. Moreover, they claimed that interoperability should have been demand-driven (since successful applications will be “naturally” offered on any API) and, if a preference were to be expressed, it should have been for portable content formats, rather than for decoder-level interoperability. More generally, they argued that access rules (based on antitrust law) would be sufficient to guarantee pluralism and cultural variety, to be primarily achieved via private negotiations between concerned operators.

Clearly, both approaches fail to capture the entire complexity of the issue. Briefly, the EBU’s approach seems particularly utopian in envisaging tough regulatory burdens on private ITV operators; a main example is when EBU calls for safeguards against new proprietary systems, such as the DRMs, which are indeed an irreversible move of the industry face to the Internet-related piracy challenge. On the other side, the pay-TV and TLC industry’s claims appear simplistic, on several grounds. First of all, ITV interoperability involves several public and merit goods, whose provision cannot be, by definition, (private) demand-driven. Further, their confidence on the effectiveness of access rules in ensuring pluralism and cultural variety is misplaced, for obvious reasons: first, access rules are mainly a safeguard for market competition, which does not necessarily imply market pluralism; second, cultural variety, as other public interests, has a public profile not entirely accounted for by private negotiations, and might also involve a public service remit. Finally, the EU CAS interoperability story, viewed in perspective, reveals how access rules’ effectiveness can result severely limited (see, for example, the assessment made by Helberger, 2005).

More fundamentally, the public consultation did not help to disentangle the various trade-offs and conflicting goals implicit in the EU policy for ITV interoperability. On one side, the EU push for decoder standardization and horizontal markets (mainly functional to its competition and trade policies) was best served by mandated standardization on MHP, but this “command” approach would not have respected the autonomy of national broadcasting policies. On the other side, a

stronger emphasis on the latter could have jeopardised the common market, because decentralised public intervention could differently impact national markets and operators, leading to selective and distorting state aid interventions. As we demonstrate in section 4.3, this is what happened in Italy.

The Commission final decision (see EC, 2004b) built on this complex consultative process and an impact assessment (see EC, 2004c) of the available policy options. This analysis, however, assumes an “ad interim” validity. In fact, Commission considers that it is premature to reach an overall assessment of the effects of Art. 18(3): since the NRF implementation resulted delayed, another assessment should have been scheduled for mid-2005. Second, for the moment being, the Commission does not detect any significant and substantiated threat to the free flow of information, media pluralism and cultural diversity. Third, the Commission also notices that in the NRF Directives there is no explicit and binding definition of interoperability. As a result, its current assessment is entirely focused on the necessity of mandating one or more open standards, or to elicit member states’ intervention (Options 1 and 3, and associated actions – see EU 2004c; pp.8-14)²³.

Basically, the Commission argues that, first of all, mandated technical interoperability at the receiver level does not guarantee consumer-level interoperability, since content providers would still have to negotiate access to the ITV facilities. However, an even more impeding factor is the “stranded installed base”, regarding 25 million of interactive decoders, which should have been replaced or, in alternative, left without interactivity²⁴; the resulting heavy cost burden would not probably be politically acceptable, says the Commission. Consequently, the only Option left is 3, that of continuing the implementation of the provisions of Art. 18(2), by which member states encourage ITV operators to voluntarily adhere to open standards and legacy API proprietors to offer their services on FRAND terms²⁵. This “minimalist” approach to interoperability also caters for the need to experiment other forms of interoperability (portable content formats, voluntary migration to open standards, etc.), and that of letting a more robust demand for truly interactive services emerge; these two objectives are synergetic, because uncertainty on the ITV demand asks for a wide range of technical options, stressing those simpler and cheaper forms – such as presentation engines. As a matter of fact, consumer choice and technological competition between competing interoperability standards also features as two qualifying advantages delivered by Option 3.

As part of these provisions, the Commission explicitly lists a series of initiatives to be undertaken for the creation of a sustainable and affordable MHP receiver market:

- 1) constitution of a working group of member states and stakeholders for the coordination of MHP implementation (MHP Implementation Group).
- 2) temporary public subsidies for consumers to purchase MHP receivers; these subsidies should be technological neutral, temporally decreasing and conform to state aid rules. The Italian experience is mentioned as a first application of this measure.
- 3) listing of further open API standards in the Official Journal (starting with WTVML and MHEG-5)
- 4) monitoring the availability of proprietary technologies for licensing to decoder manufacturers, in order to promote the take-off of the market for universal (multiplatform) receivers.

In particular, measure sub 4) extends to other technologies (tuners and API) some sort of competition screening, which the CAS already enjoys in a fuller form. In fact, the latter receives a stronger protection by the Access Directive (Art. 6(1)), that specifically mandates FRAND access terms for CAS licenses, on behalf of decoder manufacturers.

²³ The alternative option of delegating member states to mandate is ruled out, since it would institutionalise market fragmentation in a way incompatible with the Common Market.

²⁴ Backward compatibility of MHP is practically impossible, due to the complexity of this API. For example, software plug-ins enabling MHP applications to run on receivers equipped with previous APIs would be limited by the insufficient memory and computing power resources available on this hardware.

²⁵ This support does not rule out the possibility, foreseen by the Access Directive (Art.5(1.b)), that NRAs mandate FRAND access to incumbent API and EPG facilities for excluded “third party” operators.

On overall, while the list of admissible measures encompasses several important dimensions and criticalities encountered by technological diffusion, two critical profiles need to be highlighted, concerning measure sub 2): first, its object, since it does not match those measures foreseen in Art. 18(1), explicitly targeting suppliers of interactive services – presumably the weakest operators of the value-chain; second, its method, since it seems to have been suggested by the Italian practice, rather than motivated by a sound economic reasoning on its likely effectiveness. As a matter of fact, consumer subsidies are considered in the literature a rather blunt and distorting tool of market intervention, and in that particular case some Italian operators were already claiming its negative effects; in fact, this subsidization campaign was later sanctioned as illegal state aid (see section 4.3 below).

One year later, the Commission finalises its review on API interoperability in EU (see EC, 2006a). Once again, the Commission believes that it is not necessary to mandate any compulsory API standard for the roll-out of ITV, but rather that member states continue to promote open interoperable solutions (from Art.18(2)), and build their policies on industry-consensus. This time EC (2006a) presents a synthetic and more factual Communication, which however spells out a clearer vision of ITV development, more systemic, less technological deterministic and rooted on sound economics²⁶. In short, it stresses that the first EU priority now should be to accelerate the switch-over to DTV, which would act as a precondition enabling investment, the introduction of suitable business models and the eventual take-off of interactive services, driving automatically the diffusion of open APIs. Finally, the Commission adds that it will complement the entire process promoting European DTV standards in other regions of the world (thereby catering for its trade policy).

Basically, this new assessment builds on the logical framework of EC(2004b), while it adds updated market evidence and the findings of the “MHP Implementation Group”²⁷. One main conclusion of the 2004 Review was that competition between multiple open standards would have best served ITV roll-out, and the ensuing technological plurality would have best catered for the inner uncertainty characterising the consumer demand for interactive services.

Then, EC (2006a) comments on a series of market facts, updated at end-2005. First, it notices that the EU DTV roll-out, after a number of false starts, is gaining momentum. Second, that the demand for ITV has proved less dynamic than originally forecasted, and that the most successful applications have been in the commercial area (rather than in E-Government), although being purely limited to trivial applications (gambling, quiz games and so-called “reality shows”), mostly featuring “local interactivity” (or enhanced broadcasting).

Further, the Commission points out that the main promising ITV development concerns Italy. Here, more than 2 millions of MHP-interactive decoders were sold²⁸ (while the diffusion of “zappers” remained negligible), and this success is explained by the following factors (see *ibidem*; p. 6):

- 1) the voluntary agreement of Italian broadcasters to use MHP,
- 2) the introduction of the subsidy scheme for interactive decoders by the authorities, and
- 3) the definition of common implementation specifications.

According to the Commission, all the three elements were fundamental. In fact, even within the deployment of an open standard (like MHP), diverging implementations might compromise effective interoperability; instead, Italian stakeholders agreed both to adopt MHP and to implement it with common specifications. Moreover, the financial and marketing support of the Italian

²⁶ Despite its brevity, one can pick out in several passages of EC (2006a) the main stylised facts identified in diffusion studies, where the adoption of a new technology is related to supply-side and demand side conditions, subject to institutional constraints.

²⁷ It is one of the initiatives stemming from the 2004 Review - see point 1 above - aimed at benchmarking member states' situations and exchanging ideas and best practices.

²⁸ EC (2006a)'s data on MHP decoders probably refer to Daxis (2006), updated at September 2005. These data slightly over-estimate actual market sales, as collected by industry national sources (see below). The latter, in turn, overestimate the actual decoder usage rate.

Government was also deemed relevant.

Then, the Commission correctly recognises that, notwithstanding this good performance, MHP diffusion did not deliver the expected take-off of interactive services in Italy; however, the reasons picked out, in our belief, miss the very essence of the problem²⁹. Moreover, the Commission also regrets to notice that the sensible price reduction engendered by the Italian campaign did not spill over into other EU markets, where the higher price charged for MHP decoders continued to act as a significant barrier³⁰. In Germany, for example, the Commission did not observe the same degree of stakeholders coordination as in Italy, nor in the Nordic markets, despite the early market players' consensus; originally (see section 3.2 above), these two areas were the most MHP supportive.

Basically, EU-harmonised data confirm that the overwhelming share (97%) of the MHP installed base by 2005 is accounted for by Italy, and is consequently terrestrial. In fact, table 2 shows that this platform in 2005 represents 94% of the total installed MHP base. However, on the aggregate, in 2005 MHP continues to account for a small share (7.4%) of the EU APIs. Instead, the most natural candidate for benefiting from MHP interactivity, the IPTV platform, in 2005 is still in its infancy; table 2 shows that it only embeds "other APIs", delivering simple interactivity.

Table 2. API penetration and composition by DTV platform in EU, 2004-2005: units and shares

	Cable		Satellite		Terrestrial		IPTV		Total DTV	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
UNITS										
Proprietary API	4,218	4,448	21,070	21,070	0,375	0,483	0,0	0,0	25,663	26,001
Other API	2,793	3,533	3,377	3,317	6,701	9,877	0,716	1,226	13,587	17,953
MHP	0,109	0,190	0,020	0,020	0,940	3,316	0,0	0,0	1,069	3,526
SHARES										
MHP penetration	1,5%	2,3%	0,1%	0,1%	11,7%	24,2%	0,0%	0,0%	2,7%	7,4%
MHP stock composition	10,2%	5,4%	1,9%	0,6%	87,9%	94,0%	0,0%	0,0%	100,0%	100,0%

Legend: 2005 data updated to the 3rd Quarter. Figures in thousands. EU-27 coverage.

"Proprietary API" includes: OpenTV, Mediahighway (NDS), Liberate (now Seachange), MicrosoftTV.

"Other API" includes: HTML, MHEG5, and others with limited ITV features enabling mostly a basic EPG.

Source: Daxis (2006; p.11).

In the margin, EC (2006a;p.7) mentions the progress of other standards – such as MHEG-5 and WTVML – that wait for inclusion in the Official Journal; by 2005, they managed to total respectively 5 and 7 million units sold, without any public subsidy or support.

The Commission then considers the situation of proprietary solutions, which still continue to represent the overwhelming majority of the API installed base (see again table 2, with 26 million units sold), and to evaluate future policy action; in this respect, the Commission notices that, so far, it did not receive any complain concerning licensing arrangements of proprietary API, and that it will continue to monitor their availability to third parties. The latter fact, according to our analysis,

²⁹ The main reasons hypothesized by the Commission are: the reluctance of consumers to connect the decoder to the TLC socket (being the latter distant from the TV set) and frequencies scarcity, which impeded the deployment of spectrum-demanding interactive services.

³⁰ Also on this point, further market evidence supports a more negative conclusion: that in Italy the decoders' prices were maintained artificially high by the public subsidy.

can be naturally expectable, for a series of considerations that will be spelled out in the following section.

4. Disentangling interoperability through open platforms. The MHP case.

4.1 Latest market evidence on MHP

The latest market evidence points to suggest that MHP is still “in the middle of the ford”: table 3 pinpoints that MHP worldwide diffusion remains geographically limited and strongly concentrated in two countries: Italy (with a share of 69%), and, for very different reasons³¹, South Korea (25%). Coherently, the MHP diffusion within EU is mainly accounted for by Italy (92%), while Belgium follows at a great distance (only 6%).

Table 3. Ranked worldwide diffusion of MHP platforms, mid-2008: units sold and market % in the top-5 countries

	MHP (thousands)	MHP world share	MHP EU share
Italy	5.600	69.3	92.1
South Korea	2.000	24.7	-
Belgium	0.391	4.8	6.4
Finland	0.050	0.6	0.8
Austria	0.040	0.5	0.7
Top-5 installed base	8.081	100	100
World installed base	8.081	-	-

Other countries might present negligible shares of diffusion not yet covered by this MHP survey.

Source: our computations on official DVB-MHP data, updated at June 2008.

Moreover, additional evidence from DVB confirms that in most of these countries MHP services have been deployed on non-interactive platforms: in Italy, Finland and Austria on DTT, while only in Belgium MHP services have been mostly deployed on digitised cable. This fact is technologically incoherent and even bizarre, since MHP is mostly useful for truly interactive platforms. However, the previous sections on MHP stakeholders have highlighted why this fact happened: indeed, the main supporters of MHP were FTA terrestrial broadcasters, which typically do not control the technical platform; only in the case of Italy, they are vertically integrated into the transmission infrastructure.

The awareness about the diffusion difficulties encountered by MHP is increasingly shared by the Commission. After EC (2004b) and (2006a), where it first admitted the sluggish diffusion of MHP, in May 2007 DG Information Society tackled directly the issue with a letter to the DVB consortium, explicitly calling for initiatives to foster its adoption (see Eltzroth, 2007). In particular, the letter questioned the current DVB’s IPRs policy for MHP, and stressed the need for a timely disclosure of the licensing terms of those IPRs essential to implement the MHP specifications.

This letter apparently came out as a surprise. Indeed, DVB licensing scheme – including MHP, as part of the DVB standards family – first introduced relevant novelties in IPRs licensing. A main pillar is the so-called “negative disclosure” provision (ex Art. 14.1 of the DVB Memorandum of Understanding³², henceforth MoU), which imposes on each DVB member the obligation to

³¹ The Korean case is not explored here, being rather peculiar, and not representative of the European situation. Korea has rolled out DTT services on a different transmission standard (ATSC), launched in 2001. So far, MHP services in Korea are mainly satellite-based. Moreover, the country is enjoying an extensive roll-out of broadband networks, potentially ensuring cheap and full two-way interactivity; IPTV services are about to be licensed.

³² This document is the normative basis for the working of the MHP project within DVB. For a detailed account of its main provisions, see Eltzroth (2007).

license on FRAND terms any proprietary IPR essential to implement the DVB specifications, unless the member has given prior notice of its unavailability³³. Moreover, the DVB MoU foresees additional checks and balances, to prevent strategic control of gateway technologies and abuses, and supports joint licensing arrangements, the main tool being the promotion of patent pooling for DVB specifications.

Actually, patent pooling nowadays stands as a crucial tool to render timely, effective and affordable the availability of crucial IPRs, especially in complex standards, composed of hundreds of specifications; in fact, IPRs pooling qualifies as bundling, and might save both on transaction costs and double marginalization licensing issues, reducing uncertainty and – at least in theory – enabling the rapid development of “turnkey” implementations of a standard.

At the same time, however, patent pooling might also act as a powerful entry deterrence mechanism, since IPRs cross-licensing automatically confers upon the pool members a superior cost structure, with respect to non-members. This strategic function, typical in complex ICT standards, has been well documented in the case of GSM standardization by Bekkers et al. (2002).

Apparently, in the MHP case other original problems were at stake. A main point is that patent pooling formation was very late (finishing in early-2007) and yielded a doubtful outcome. In fact, as summarised by Eltzroth (2007), some crucial terms of licensing chosen by the MHP patent pool were surrounded by multiple layers of confidentiality, and potential implementers were hampered in assessing the quality of the patents included. Similarly, additional pilot instruments recently introduced by DVB (such as “peer-review” programmes to assess the essentiality of patent claims) were vanished by some confidentiality rules invoked by IPR holders.

In short, the ensuing *de facto* unavailability of crucial terms of licensing of essential MHP patents might have pushed back some of the potential licensees and final adopters (*in primis* DVB members and MHP implementers, including CE manufacturers and broadcasters). Moreover, this situation highlights how, despite the innovative licensing schemas contained in the DVB MoU, their actual impact in promoting MHP diffusion was limited.

While we recognise that these licensing inertia and obstacles might have acted as causes of possible diffusion harm, we believe that they qualify for a more strategic interpretation, and that, in any case, the whole story should be framed within a more systemic and structural explanation of the current MHP failure.

Concerning the first point, the market evidence on the delay of the patent pool and its multiple layers of confidentiality can also be interpreted as evidence of strategic manipulation of interface standards and enclosure strategies (see Mackie-Mason and Netz, 2007), that are not immune from anticompetitive effects. However, at the end, due to the adverse evolution of the technological paradigm, these standardization tactics might have worked against their proponents, since the standard has not taken off and market power not achieved (thereby depicting a strategic mis-match between high proprietary control and radical innovativeness, but low network effects and technological performance, according to the well-known Shapiro and Varian, 1999’s strategic taxonomies).

Concerning the need for a wider interpretative framework, we believe that the MHP story cannot be reduced to a case of IPRs mismanagement or institutional fallacy (of the its standard-setting bodies), since it involves further dimensions, mostly neglected by EU institutions and DVB stakeholders, which enrich the final picture.

4.2 MHP and the EU policy: a critical assessment

The analysis of this section develops recapitulating and reframing some main facts and points

³³ In this way, contrary to most SSO rules, the burden of disclosure is reversed and put on the DVB members. The first negative disclosure window opens for 90 days after the provisional adoption of any specification by the DVB Technical Module (Group), while the second window, which requires a stronger qualifying motivation, lasts up to the final adoption of the specification by a formal SSO (see Eltzroth, 2007) .

introduced in the previous sections, grouping them under three main areas:

Technological limits of MHP and ITV projects

The first relevant obstacle for the feasibility of any EU standardization policy covering the whole TV industry is that the presence of different TV platforms implies different technological potentials for two-way interactivity. Basically, along a continuum, we go from terrestrial TV (having no return channel “built-in”) through satellite (where a wireless return channel is technically possible but still too costly for households) to end up with cable and IPTV (both DSL and fibre optic), which naturally embed an highly performing broadband wire line return channel, enabling fast and complex interactive applications.

A second main point, raised in various consultations and documents, concerns the decoder level. It says that MHP is a too complex specification for the first generations of “dumb” DTV decoders; in fact, being the MHP software based on the Java language, it needs a too “intelligent decoder”, compared to the market prevalent design. As such, MHP decoders inevitably require more memory and higher processing capacity in the CPU, and price much higher than other simpler interactive alternatives.

Economic profile of the MHP and ITV projects

A first point stems from the “installed base” rationale stressed in studies on technological diffusion. According to the literature (see again Katz and Shapiro, 1994, Gandal, 2002), diffusion contests between two versions of the same technology (old and new) are likely to experience strong inertia in the presence of network effects and forward compatibility issues³⁴. This problem was considered relevant for API by various TV operators, and none of the evaluated policy strategies attracted a sufficient consensus. Here it is sufficient to remind that any scenario was thwarted by some relevant stakeholder. A generalised fast migration to MHP was considered unjustified and costly by most cable operators (see ECCA, 2003), but to a lesser extent also by the same broadcasters (see EBU, 2004). Most radical positions were put forward: major IT players (see Microsoft, 2003) even contested the very need for API (or decoder level) interoperability, in favour of content portability (content-level interoperability).

Secondly, “common sense” analysis suggests that, while simple ITV loosely competes with existing PC and Internet-based services, two-way ITV purports to offer the same functionality, so that the latter qualifies as close competitor of Internet. Having in mind the large installed Internet base and the approaching reality of Internet TV, it is very unlikely that two-way ITV services will soon emerge³⁵. The last consideration is reinforced by the fact that most of the ITV roll-out has occurred on low or non-interactive digital platforms (respectively satellite and terrestrial), which present a clumsy and burdensome interactivity profile. Another layer of difficulty lies on the user interface (the remote control) ergonomics, which is far from being a user-friendly and performing terminal for interactive services.

Third. Concerning the debate on the exorbitance of FRAND terms, often associated to open standards, the literature so far has been rather sceptical, both about the very existence of the problem and the proposed remedies (see Geradin, 2006). In particular, despite the diffuse claims that FRAND terms might indeed result financially unsustainable for complex standards and for emerging and “systemic” markets, a certain lack of evidence has weakened this opinion: instead, we believe that the MHP case is a good first example of support. The analysis and evidence presented

³⁴ Here, one main profile of forward compatibility inertia derives from the fact that decoders work as converters enabling analogue devices (TV sets) to forward-interoperate with digital transmission.

³⁵ The main difficulty is for existing private services: that of having alternative T-commerce or T-banking services emerge, when much more performing options (E-commerce and E-banking) are already in place.

in this paper reinforce the diffused claims that Via Licensing's³⁶ fee structure for MHP was unbearable for broadcasters (see Screendigest, 2006; pp. 82 and 117). An indirect confirmation comes from the fact that, following these claims and the low diffusion performance of MHP, Via Licensing in June 2008 has announced its intention to remove completely for FTA broadcasters the requirement to pay MHP patent licence fees.

More fundamentally, any IPR licensing cost should be compared against its revenue generating potential. At the moment, the interactive services' market potential is undetermined. Further, since many national terrestrial switch-off dates have been postponed and the EU has envisaged a new possible term for 2010-12, also the take-off of interactive services is likely to be significantly retarded.

Similarly, the digitalization and roll-out of the most performing interactive DTV platforms is late (cable and IPTV), while the Internet TV – a close TV substitute viewed by PC – is progressing faster (the user-generated content phenomenon being its main example). Moreover, digital cable and IPTV nowadays strive to create a sustainable business model but, according to business' sentiments, interactive services do not seem a significant "killer application" and consumers' willingness to pay for them is negligible. Paradoxically, the most promising market for interactive services, Internet TV, is out of the scope of Art. 18 of the Framework Directive, since the latter does not cover DSL-based services.

Institutional and policy mismatches

First, a few conceptual inaccuracies seem to undermine the foundations of the EU quest for interoperability through open standards. First of all, EU law and the Commission documents remain vague on the basic concepts. While the NRF does not provide any binding definition for interoperability, the Commission does not unambiguously specify what are "open standards"; however, since both concepts are multidimensional (see again Krechmer, 2006, West, 2003), the logical framework of the policy remains vague and leaves scope for risky analogies, such as that between open standards and open source. While open standards might include different licensing schemes for its underlying software components, they do not coincide with open source³⁷. Moreover, their subjective and procedural characteristics might occasionally and partly overlap, but more often differ. Occasionally open standards may not prove to be the best deal for end-users, while open source typically is, with reference to its peculiar class of developers-users.

Going into the policy rationale, on overall, the EU policy-making, despite its legitimate concerns for interoperability and pluralism in ITV, did not express a sound grasp of API techno-economics. In fact, notwithstanding the rich consultation process and the consensus-based approach, the final political synthesis of the Commission failed to highlight a crucial factor - the likely "crowding-out" effect exerted on the policy by the differences existing between the value chains of ICT and broadcasting and, within the latter, between the different business models (FTA and pay-TV) and levels of vertical integration. These differences appear frequently underestimated in the Commission documents, or even hidden under the surface of a generic rhetoric on the "digital convergence". In particular, the Commission fails to consider that the economic incentives towards the promotion of platform interoperability, open standards diffusion and even the final digital switchover are not aligned between FTA and pay-TV operators, mainly due to the different markets served: "mass" for FTA TV versus "large niche" for pay operators.

Another fundamental contradiction contained in the ambitious EU Plan for API interoperability is that supportive policy is mostly needed at the beginning of the technological cycle, to cater for pluralism and cultural variety. However, in this early time frame the policy cannot distinguish market failures from technological failures: so, the possibility for a market-

³⁶ This company administers the licensing programme on behalf of the patent pool, mainly composed of Comcast, Open TV, Panasonic, Philips Samsung, Thomson and Time Warner Cable.

³⁷ For example, MHP is based on Java, which is not open source.

driven and technologically neutral policy (following the NRF) is severely restrained. Later, market evidence has confirmed that different platforms fulfil differently the same policy goals and economic sustainability criteria. While the market for simple (one-way) interactivity has gradually expanded and become profitable (for a recent account, see Screendigest, 2006), that for true (two-way) ITV services has not, and its techno-economic feasibility remains - even nowadays - largely unexplored.

Another layer of complexity underestimated concerns the inner geographical variety and complexity of the EU media landscape. Differently from the US, in EU one common policy is not likely to “fit all” member states. A negative antecedent of the EU policy was the policy for CAS interoperability (ex Directive n.47/95), which yielded modest results despite the intensive EU push³⁸ and the reinforced status of its normative provisions; the uneven national implementations and the ineffective antitrust enforcement chiefly mattered³⁹. Despite this low policy performance, the CAS case was much simpler than API, since only pay-TV operators were directly involved.

Going to the inner complexity of the EU ITV policy, we need to remind its tough trade-offs, which present potential conflicts with other bodies of the EU law and policy-making. As noted by EC (2004b), mandated interoperability (aimed at pluralism) might chill technological progress. However, there are other more fundamental trade-offs involved. First, trade policy and international contests for controlling global standards cannot be easily conciliate with competition policy and cultural pluralism, since the firsts frequently advocate a few big integrated national or EU-wide champions. Moreover, the implementation of the NRF has been uneven and its coherence with other bodies of EU law – in particular with content regulation and pluralism, residually contemplated also in Art. 18 of the Framework Directive – highly shaky, requiring further assessment.

Further, despite the initial regulatory impetus on API interoperability, the policy leverages of the EU institutions remain limited and mostly ineffective, concerning the promotion of media pluralism and cultural variety. In fact, member states continue to be entrusted with major content regulation competencies⁴⁰.

In this particular case, the Commission was induced (apparently from the Italian case) to legitimise rather blunt and distorting policy tools, such as monetary consumer subsidies, while the complexity of the policy mix should have suggested to rely on “soft” and pre-market instruments (R&D subsidies, publicly stated targets, institutional suasion and coordination).

The latter two points are well represented by the Italian case, which well demonstrates how complex and unrealistic policy projects might yield unintended and sometimes paradoxical consequences, even for the basic goal of promoting pluralism.

4.3 *The Italian case reconsidered*

In EC (2006a), the Commission shows off the Italian case, purported as an example of successful MHP adoption and effective API interoperability. On overall, apart from minor remarks⁴¹, Italy is also presented as a positive policy model for the DTV roll-out.

³⁸ After a debated and painful legislative process, the EU institutions stroke the compromise mandating the CAS interoperability and compulsory “third party” licensing, but leaving operators to choose between two technical alternatives: either *simulcrypt* or *multicrypt*.

³⁹ The actual implementation of the Directive n.47/95 in the member states has been late and uneven, and its interoperability outcomes insufficient. Many incumbent operators, choosing the *simulcrypt*, have manage to maintain a stronger bargaining power and have profited from a larger degree of discretionary power on interoperability terms; on overall, they tried to delay as much as possible interoperability with rival offers. Italy provides an illuminating case.

⁴⁰ As also recognised by the Commission “more significant elements in the media pluralism debate lie within the competence of member states, notably media ownership and control” (see EC 2004b; p. 9).

⁴¹ Indeed, some of the problems noticed by the Commission (see EC, 2006a; p.6) appear inexplicably underestimated. For example, the Commission acknowledges that in the Italian DTT, due to the spectrum congestion and scarcity (exacerbated by its concentration in the hands of two operators), interactive services will not be deployed during the simulcast phase, but only after the achievement of the analogue switch-off, now set for 2012. This point has shattering implications on the rationale of any public policy focused on the promotion of interactive decoders.

A closer look at the Italian subsidization experience allows to frame a different and less enthusiastic view of this experience, both on the purported success of the MHP and on the overall DTV policy: in fact, they have been instrumentally shaped by lobbying and the business interests, hampering competition and pluralism in one of the most concentrated broadcasting markets in EU.

The many errors and inconsistencies of the Italian DTV policy date back to the past decades: in fact, Italy presents a unique case of chaotic and unregulated evolution of the sector, whose main elements are the powerful lobbying of terrestrial broadcasters, a permissive normative framework and the non-enforcement of antitrust provisions. The ensuing market structure was a “blockaded” national duopoly between RAI (the public) and Mediaset (the private) operator, broadcasting 3 channels each in a national landscape *de facto* limited to 8 national networks⁴².

The spectrum chaos and the high concentration of the TV advertising market – in 2005, Mediaset was still controlling a share of 65% - was not solved by the Laws disciplining the DTV launch (n. 66/2001 and 112/2004). Lacking a national politics’ solution, the irregular spectrum distribution has been recently challenged by the EU institutions, with the Commission initiating an infringement procedure under Art. 226 of the EU Treaty (see EC, 2006b), for discriminatory policy⁴³.

For the moment being, a series of problems has been hampering the DTT diffusion and audience, due to its faulty transmission and reception performance⁴⁴. However, we believe that the most striking defect of the Italian DTT offer is not even its critical technical profile, but its content offer: a few tents of poor and unattractive FTA channels, compared to the thousands available on FTA satellites. Consequently, various statistics have uncovered that a substantial rate of the installed decoders base has lain unused or technically troublesome, overturning the initial convulsive dynamics of adoption in 2004-05, boosted by the public subsidies set for DTT decoders.

The early introduction of the DTT pay-per-view offer (in 2005, just one year after the FTA one) by Mediaset and La 7 has later uncovered that the real DTT strategy of the two private operators was to develop first the pay-TV business: in fact, the latter was the sole to be financially sustainable, face to the low population coverage enabled by the DTT networks. As a long-term strategy, broadcasters would have started investing on the FTA programming as soon as the DTT coverage and audience would have reached rewarding levels. Once again, mirroring the analogue past, the two broadcasters launched several pay-TV channels, being free from any antitrust limitation and profiting from redundant spectrum⁴⁵.

In this respect, the EU policy for the promotion of the MHP acted as an important – if not fundamental – ingredient for the profitability of the private strategies. In fact, the provisions of EC (2004b; p.8) had initially legitimised the public subsidization of MHP decoders – citing the Italian initiative as a positive implementation of the admissible measures.

Indeed, the ensuing subsidization campaign was successful, financing roughly two millions decoders; the amount of the unit subsidy was relevant, covering roughly half of the average market price of the representative decoder during the “first” campaign (spanning 2004-2005)⁴⁶. Thanks to the subsidy and the resulting economies of scale, the average price of an eligible MHP-interactive decoder in Italy fell, within two years, from 300€ to 150€ - a price similar to that of *zappers*

⁴² The third marginal national operator is La 7, broadcasting 2 channels, owned by Telecom Italia. A long run economic analysis of Italian broadcasting is provided by Gambaro and Silva (1992), while the most recent period is covered in Nicita et al. (2008).

⁴³ In the opening decision, the Commission censures the asymmetric treatment in favour of incumbent analogue operators (basically the duopolists), as codified in the Italian DTT normative, and warns the country about the resulting possibility that the digital dividend for new entrants and digital services is nullified.

⁴⁴ More details are provided by Matteucci (2007). Concerning households’ reception, a large portion of existing terrestrial antennas and reception devices needs modifications or upgrading, before effectively switching to digital. In 2006, two years later the DTT launch, Eurosatellite estimates a reception fault rate equal to 40% of total installed DTT decoders base.

⁴⁵ This possibility mainly applies to Mediaset, since the La 7 network coverage is sensibly lower.

⁴⁶ More details on the subsidization campaign can be found in Matteucci (2007).

(unsuitable for pay-per-view services). Moreover, due to the attractive content (the pay-TV offer built on Premier League football matches), another two million units sold without subsidies, after their exhaustion; by mid-2006, the average market price had further halved. The public subsidies of the first campaign were reserved to digital decoders able to receive terrestrial and cable services, and possessing certain technical requisites of interactivity and interoperability, which were later discretionary interpreted as meaning the inclusion of the open API MHP⁴⁷. Satellite decoders were instead excluded *in toto*, on the ground that most of them - promoted by the pay-TV operator Sky - were embedding proprietary APIs. However, despite formal cable inclusion, in practice the measure has only subsidized terrestrial decoders, since cable TV never existed in Italy (being killed by adverse regulation in the Seventies), while IPTV has only recently been introduced.

The measure attracted strong criticism, both in the political arena (the opposition pointed out the interest and institutional conflict of the Prime Minister Silvio Berlusconi, whose family controls Mediaset) and among market competitors. Following these claims, the EU Commission opened a procedure for illegitimate state aid and, after a long enquiry, in January 2007 sanctioned the Italian measure, declaring illegitimate the exclusion of satellite decoders from the public subsidy and censuring its selective and distorting effects on competition in the pay-TV market, favouring the DTT over satellite (see EC, 2007). Hence, it imposed on the DTT pay-TV broadcasters the burden of refunding part of the subsidies, for the share attributable to the illegitimate pay-TV gains enabled by the measure; at the end, only Mediaset has been determined liable to refund it.

In short⁴⁸, the moral of this story is that the NRF provisions on API, originally conceived to promote pluralism, have indirectly legitimised measures aimed at favouring the strongest Italian incumbent, which has been publicly supported to enter a new market and consolidate its positions in Italy, one of the most concentrated broadcasting landscape of EU, both for pay and FTA markets.

Moreover, this outcome - although paradoxical and unintended - is not the only negative side-effect of the Italian measure. Also its results in terms of effective interactivity and interoperability need to be reconsidered, with respect to the EC (2006a) superficial appraisal.

A preliminary remark is that the hypothesis of the propagation of the price decreases stemming from enlarged national horizontal markets did not materialise. In fact, the substantial price reduction engendered by the Italian subsidy to MHP did not spill over the national borders, as also recognised by the Commission (see EC, 2006a). If the explanation is rooted on supply and demand factors strictly delimiting broadcasting into separate national markets, one should also dismiss the very possibility to regulate interactive services on a Common Market basis, as implicit in the NRF.

More importantly, EC (2007) fails to acknowledge the patent failure of the Italian subsidy campaign in fulfilling the interactivity and interoperability goals stated in the EU policy. This fact is rather curious, since in a similar state aid case, concerning state aid to DTT in the German Lander of Berlin-Brandenburg, the Commission had severely challenged the technological and interactive potential of DTT (see Matteucci, 2008; sect. 3.3; point 4), while emphasizing truly interactive platforms, such as DSL-based technologies.

Now, the practical outcome of the Italian campaign for ITV was even worse than in the German case, which has already achieved a quick and ordered analogue switch-off. According to the stated plans of the Berlusconi Government, interactive services - both private and public, such as the T-Government - should have been developed and soon delivered via the DTT platform, despite the substantial immaturity of the technological platform and the tentative nature of their business model.

⁴⁷ In fact, the texts of the Finance Acts (and accompanying Decrees) were rather synthetic and cryptic. They were clearly requiring, as a condition to obtain the subsidy: 1) the regular payment of the annual TV licence fee, 2) the purchase or rental of a DVB-T decoder, or a DVB-C one retransmitting terrestrial services at no further costs for both viewers and content providers, 3) the presence of interactivity, without any further distinction between local or remote. See EC (2007; sect.7).

⁴⁸ A detailed exam of this state aid case is given by Matteucci (2008), who also compares this to other similar cases in EU.

In time, a mounting evidence has restated the unrealistic ambitions surrounding the Italian T-projects, most of which, after having received relevant research grants, have delivered negligible outcomes and are now frozen (see CNIPA, 2007). Moreover, among the few T-business projects implemented, most of them have only concerned local interactivity. In fact, only a small share of MHP households keeps their decoder connected to the telephone socket, and even fewer use interactive services. The main services minimally accessed qualify as enhanced broadcasting: TV-text, quizzes, games and reality-shows (see DGTVi, 2006; p.88): for these, a MHP module is absolutely redundant⁴⁹.

After all, these results were largely expectable. The technological basis on which the T-projects were laid down was shaky and immature, both on the receiver and the business model side. The subsidized MHP decoders are (still) equipped with a narrowband TLC return channel, have an insufficient memory and processing capacity and, consequently, present a unbearable long time latency when they are operated for interactive services, which instead require broadband. Moreover, the obscure contractual terms and high costs of connection discouraged many customers, facing a cheaper, reliable and more user-friendly alternative in broadband Internet services.

In short, the ITV project in Italy, in spite of being purported as a positive example of MHP implementation, qualifies as a wasteful and publicly useless outlay of tax-payers' money, while the entire project was highly valuable for the take-off of the pay-TV offer on DTT, as eventually recognised also by EC (2007)⁵⁰. At the same time, Italian broadband penetration and infrastructure upgrading falls behind, ranking Italy as one of the most laggard large EU countries for the roll-out of truly interactive Information Society services.

5. Conclusions

The story of the EU regulation of interoperability of ITV is a good example of the difficulties the policy-maker encounters in forecasting technological development and in framing appropriate normative and institutional solutions. Pushed by the European Parliament, the Commission has been entrusted by the NRF with a complex role of scrutiny of the degree of interoperability of interactive services, transmitted via the traditional TV set (ITV). As a "last resort" solution, lacking an adequate level of ITV interoperability, the EU Commission should have mandated directly open standards, to impose interoperability. In particular, open standards were deemed as the most appropriate solution to achieve decoder-level interoperability, and to avoid that proprietary and monopolistic strategies - frequent in the broadcasting markets - fragment and dampen ITV take-off, pluralism and cultural variety in the EU markets.

The first open specification selected for public support has been the MHP, a complex API standard needed to manage the most elaborate functions of the decoder, like interactive services and pay-TV. Consequently, the MHP has attracted strong political support and relevant public funds.

So far, updated market evidence shows a sluggish diffusion of the MHP, while other simpler versions of APIs spontaneously affirmed. Moreover, truly two-way interactivity mostly lacks on the existing DTV offers, and the market sentiments signal that advanced interactive services (T-commerce, T-government) are not considered a significant driver of DTV, while their close substitutes - carried by the Internet - increasingly take place among EU citizens.

When we turn to assess the EU policy on ITV interoperability, all the available evidence points to a substantial failure; ITV policy nowadays appears abandoned, after having devoted substantial resources to its implementation.

⁴⁹ Instead, the MHP module and its smart card reader (both required for the subsidy eligibility) have been essential for enabling pay-per-view services.

⁵⁰ Obviously, the Commission services involved were different. While the ITV policy was framed within DG InfoSoc, the state aid case on the decoders campaign was decided by DG Competition.

The analysis of the failure of this endeavour uncovers several critical points and inconsistencies.

A main faulty dimension is the underlying technological vision. The very belief of rendering interactive the TV set is at least contentious, if not utopian. So far, different TV platforms enable different types and degrees of interactivity, so that the idea that “one policy fits all” was basically wrong, and mainly constrained by the necessity to frame a technologically-neutral approach, according to the NRF principles.

Another problematic dimension was the policy approach of treating homogeneously the entire broadcasting industry, which includes several business models and features different incentives to interoperability, according to the subjects. The basic partition between FTA operators (MHP supporters) and pay-TV ones (opposers) was largely expectable, and should have been considered framing a different approach to interoperability, focused on reinforced antitrust intervention and content portability.

In general, the complexity of the policy mix would have required only pre-market instruments (R&D stage), consensus-building processes and market-driven tools, and should have avoided monetary subsidies: the latter are a too blunt and uncontrollable instrument, which might irreversibly distort the markets: the Italian subsidization campaign offers an exemplar and unknown proof, largely ignored even by the Commission itself - at least up to the most recent times.

The Commission’s endeavour, beside its inner technological complexity, was even complicated by the structure of EU Law, which separate infrastructure from content regulation, while interactive services fall in between. Moreover, while EU Institutions play a leading role in infrastructure regulation, content is mainly left to member states’ competence, following the subsidiarity principle. As a consequence, an issue of conflicting competences also arises in the ITV policy implementation.

Moreover, the entire policy-mix on ITV interoperability suffers from internal inconsistencies, imposed by the wide array of policy goals, spanning from infrastructural investment and competition to pluralism and cultural variety, from strategic trade policy to innovation policy.

Another main area of criticism arises from the tricky analogy sometimes associating open standards and open source, both in the political and market arenas. While they might occasionally be similar, these phenomena in principle greatly differ, and any analogical treatment undermines the policy soundness. At least at the beginning, these ambiguities have substantially affected the EU and national policy-makers’ vision. Moreover, looking at the MHP story, one can detect a sort of institutional favour for this particular open specification, whose merits have been too early and uncritically upheld, while the following facts have uncovered various signs of IPRs mismanagement and strategic tactics by essential IPRs holders.

More generally, while open standards continue to stand at the IPR management frontier and significantly contribute to the new paradigm of “open innovation”, they cannot be uncritically upheld against market evidence of anticompetitive conduct and strategic standardization.

This paper wants to conclude with a more optimistic view on the prospects of ITV, and the possible scope for a more illuminated EU policy approach. Recent evidence suggests that Internet TV (that delivered via broadband and PC) is gaining momentum, while traditional TV falls behind. Time has come to revive the original goals of the EU ITV policy – such as pluralism and cultural variety - but this time the latter has to be framed in a different domain, using the policy instruments of the Internet world.

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