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COMPACT: FROM RESEARCH TO POLICY THROUGH
RAISING AWARENESS OF THE STATE OF THE ART ON
SOCIAL MEDIA AND CONVERGENCE

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D3.I Categories of pre-standardization initiatives



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Project Context

1.1 Project goals

The objective of the COMPACT project is to increase awareness of the latest technological results among key stakeholders in the context of social media and convergence. The dissemination planned will be based on key areas that impact the convergence of social media including scientific, political, cultural, legal, economic and technical areas, to name but a few.

This is particularly essential to provide knowledge support, but also stimulate an appropriate debate among the various stakeholders (policy makers, regulators, the business community, technical specialists, academics and the public at large) on the desirable future policies and frameworks that are required and lacking in the state of the art concerning media and content convergence.

Additionally, the project seeks to provide research on and experience-exchange of policy and regulation strategies. The aim is to support the R&D digital programs by spreading the innovative ideas and also the innovated outcomes in the age of convergence. To achieve this, the project will offer analyses and road maps of related initiatives. In addition, extensive research on policies and regulatory frameworks in media and content will be developed, integrating crucial topics such as: the types of regulation that are possible, sensible, and currently implemented, joined with contextual analysis of the corresponding issues; court case study on the types of cases that are brought before domestic courts and their implications on fundamental rights, the ways in which domestic courts review interference with fundamental rights in the pursuit of public interests, and the impact of court decisions on national laws and policies concerning social media and convergence; and future trends and recommendations in the policies and regulatory frameworks in media and content convergence.

As a European project ideally COMPACT will cover all EU countries, although the involvement of additional countries is not excluded (upon an agreed scheme of selection). The dissemination process of the outcomes will be of a rather geographically widespread nature but focused only on specific groups or individuals, as media and content are by definition the resort of a wide and diverse group of stakeholders. Thus, the project will tackle both the public and the private sector, and with that the policy makers, the academies of science and the universities, but also indirectly communicate with the ordinary users and consumers the benefits of ICT aiming at including the future participants in the creation of the novel trends in social media and convergence understanding and regulation. All of the accomplished results will be compiled and classified by special compendia.

The project is dedicated to offering comprehensive and up to date overviews/synthesis in the most logical way possible that would pave the way towards a structured explanation of the novel phenomena in the convergent environment. In turn this will lead to the balanced protection of the stakeholders' fundamental rights versus responsive regulation schemes. On an everyday basis and to the benefit of any common user COMPACT results will be distributed through press releases and other communication means encompassing the discussion and practices exchange during the relevant seminars.

1.2 Excellence

In most general terms convergence means areas or processes coming together. However, there is no one accepted definition of convergence and often it is rendered in a more or less descriptive manner. It is important to state that so far much difficulty had arisen in defining the notion of media convergence. Media convergence can be explained in many ways - through the convergence of the media and the telecommunications' sectors, through the convergence of the media and the new communications services and the emergence of common platforms and services between various operators, hardware and software manufacturers, print, electronic and new communication service outlets and Internet service providers, or as the convergence of various networks or different media content in the digital age.

By and large convergence can be perceived as technical convergence - 'coming together of different equipment and tools for producing and distributing news' or as socio-cultural convergence referring to the 'flow of content across multiple media platforms', suggesting that media users nowadays play a crucial role in creating and distributing content. Convergence therefore has to be examined in terms of social, as well as of technological changes within society (Jenkins). Yet convergence happens at four levels, which are closely interrelated (Latzer, 2013a): Technological convergence plays a leading role and basically stands for a universal digital code across the convergent communications sector. It is also discussed as network and terminal convergence (Storsul & Fagerjord, 2008). Combined with technological change there is economic convergence (Wirth, 2006), including market convergence on the meso- and macrolevel, and corporate convergence on the micro-level. Thirdly, political convergence is discussed as policy and regulatory convergence, leading towards integrated regulatory agencies, models and laws for the mediamatics sector. Finally, there is socio-cultural convergence, also discussed as socio-

functional, rhetorical and receptional convergence (Storsul & Stuedahl, 2007, Brun's concept of produsage) and as convergence culture (Jenkins, 2006). This includes the implications of the convergence process for genres across media, for media-usage and reception patterns and for popular culture.

A) A conspicuous feature of the COMPACT project is that it will represent a holistic approach in the compilation, dissemination and recommendations for the research on the latest technological and policy developments in convergence and social media, but also in the development trends among the policy stakeholders. By examining how the technological and the socioeconomic aspects of media and content convergence are interrelated, it will contribute to bridging the gap in the understanding of the research and policy making processes among the different stakeholders. This will provide insights into the feedback from the stakeholders to media/content functions, based on the roadmaps and the research agendas that will be the product of the project. Currently, this bond is mostly seen unidirectionally, which burdens the research and policy exchange in convergence and social media. This is an increasingly important topic both for social interactions and media governance.

B) Collected, compared and analyzed information about various strategies and roadmaps from a technological and social perspective should provide indirect support for R&D programmes through the dissemination of outcomes and organisation of scientific and/or policy events. The EU supports 27 technical projects focused on social media and convergence. Overall, there are dozens projects that tackle social media (over 18,000 mentions in the CORDIS database) and over 500 mentions of "social media and convergence". Obviously, this data does not include nationally or locally funded projects or private sector commercial research.

C) In detail the project will provide comprehensive information, analysis and development of research agendas and roadmaps, pre-standardisation initiatives and stakeholders' coordination within convergence and social media.

Against the backdrop of these ambitious objectives we believe that the added value of our project – as a whole and of any of its deliverables - is:

First, its approach, which is an **integrated** one as a scholarly object of research, the project will discuss both technical and socio-economic aspects and issues in a **holistic manner**. In other words, it will not only analyse how each of these aspects contributes and progresses towards the

European goal for encouraging informed participation by the public in matters of common interest, but also how the two are interrelated towards the achievement of that goal;

Second, a significant variety of entities and viewpoints are included in the research team, which also adds to its characteristic as an integrated project. This will contribute to a greater level of coverage for the stakeholders that need to be aware of the regulatory challenges in media and content convergence as these issues are becoming multi-jurisdictional;

Third, it is an **open, broad, and yet responsible research approach** that will not only rely on the knowledge and experience of various stakeholders, but also on the public interest and attention during the whole process. It represents the stance that freedom, diversity and pluralism must be predominant values in the work of governance bodies. Freedom primarily refers to the rules of freedom of expression and information as stated in democratic constitutions and international conventions on human rights. But it also applies to the interaction between the States and their citizens. Diversity and pluralism as values do not just refer to social media and content, they are also values of utmost importance in the selection of regulators and in the actions of the industry and public actors. In that sense, the project spans across more contexts than just the media and content convergence in the digital realm;

Finally, the project's scope is an added value in and of itself, as it will account for **ALL EU official languages sources**. It will also include (within research agendas and roadmap areas) examples from selected non-EU countries such as Norway, Switzerland (due to their special relationship with the EU), USA, Republic of Korea and Singapore. This is because Korea and Singapore (together with Finland) rank highest on how much their policies contribute to global innovation according to Information Technology and the Innovation Foundation 2015 Report.

A challenging pursuit within COMPACT is to examine and summarize pre-standardisation initiatives in all EU countries plus selected non-EU countries: governmental level crosschecked with data from professional companies and/or professional associations. This data will be compiled and clustered within analytical sections and the subject of further analysis . It will be classified into a **compendium** within relevant sections and will be made the subject of further analysis with a view of its further development as a living organism and thorough practical use by various stakeholders.

WP 3 Compendium on pre-standardisation initiatives within the EU (+ selected non-EU countries) focused on Social Media and Convergence, expected size: 60 pages, will be divided into sections .

In addition to this the stakeholders coordination in all EU countries + selected non-EU countries: governmental level crosschecked with data from professional companies and professional associations will be explored. This data will be also clustered within logical sections and will be the subject of further analysis from the perspective of the improvement of the stakeholders' dialogue and coordination both at a European and national levels.

It is obvious that technology alone will not be able to sustain the creative potential of the digital economy if the socio-economic, the legal and regulatory frameworks are not adequately taken into account. Therefore, we aim to explore stakeholders coordination in all EU countries + selected non-EU countries: governmental level compared with data from professional companies and professional associations.

Stakeholders' coordination is a complex process that poses many questions. **First**, it is the issue of its effectiveness that is of key importance for the result produced. The scale can be "very effective coordination" (regular meetings, minutes, assigned tasks) to somehow valid (comparatively with previous, this is at a lower level – less frequent meetings and unclear progress), through more or less formal coordination (coordinating body exists but there are only ad-hoc meetings with no real progress) to no-coordination. In this respect the mechanisms applied can be evaluated also from the perspective of democratic involvement – carrying out consultations, discussions and brainstorming. **Next** comes the problem of efficiency or how the result has been achieved utilizing the available resources. Effectiveness and efficiency presuppose the elaboration of a set of performance indicators for their regular assessment. The indicators are unique and have to reflect the specificity of the activity performed. **Third, it is the organizational analysis** that can reveal how the structure of the body and its relationship to other bodies and organizations (single body, multi-stakeholder body, and no-coordination at all) impacts coordination. Last but not least, the procedures that are followed also matter as they can promote good coordination or stifle it, they can delay or accelerate activities towards the accomplishment of the desirable goals.

Stakeholders coordination is global, national and sector specific. It has to be examined against the background of international and national documents and the fundamental perspective(s) of Coordinators stated. The comprehensive study of this multifaceted activity requires various

analyses to be made –scientific, political, economic, technical and cultural as the object of investigation is a multidimensional phenomenon like social media in a multidimensional environment.

Overall, we expect to get a rather precise and rich overview of stakeholders’ coordination within social media and convergence.

Herein we present tables from our proposal which render examples of the prestandardization procedures and multistakeholders’ coordination that will guide our research.

WP3 will provide information, analysis and development of pre-standardisation initiatives and stakeholders’ coordination within Convergence and Social Media in order to raise awareness and improve coordination among stakeholders in this area.

End 23 Month

WP 3 Deliverables

D3.1 Categories of pre-standardisation initiatives MoD: 16/12?

Multi viewpoint coding	Streaming Content	Content aware networks	Architectures for massive content distribution	Content searching, finding & retrieval	Architectures for converged networking
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Content aware routing	Content Filtering, aggregation	Storage, caching, repositories	Architectures for 3D augmented worlds	Contextual based Searching	Rendering of complex scenes
3D content representation	Beyond HDTV /electronic cinema	Quality of experience	Optimised searching	Social Networking	

D3.2 EU Member States Progress/Focus in/at policy pre-standardisation initiatives - MoD 18

Milestone :Completion of the report on on EU Member States Progress/Focus in/at policy pre-standardisation initiatives

Architectural Issues	Streaming Content, Content Aware Routing	Content Aware Networks & Caching
Searching & Retrieval	3D coding, representation and rendering	New Media Experience

D3.3 Report on Stakeholders coordination- MoD 23/22
Stakeholders coordination – Situational Report

Who is responsible?	Single body	Multi-stakeholder body		No-coordination
Effectiveness of coordination	Very effective coordination	Somehow effective coordination	more or less formal coordination	No-coordination exists or only very weak coordination
Key Perspective of coordinators	scientific	political	economic	technical

Impact

The major constituent components of convergence include integrated strategies, control structures and legal frameworks for the convergent communications sector; a technology-neutral functional taxonomy; a subdivision into transmission and content regulation; and a growing reliance on alternative modes of regulation such as self- and co-regulation (Latzer, 2009). **Indeed, social, political, and organizational dynamics select single industry standards or dominant designs from among technological opportunities.** However, these impacts may appear difficult to achieve.

Firstly, there may be significant political or policy barriers or regulatory capture that can hamper or weaken the processes. Consistent implementation of stakeholders’ dialogue, coordination, transparency and the **strategy of referencing patents can be helpful solutions to protect companies in the standardisation process.**

Secondly, technological progress may supersede the already emerging technological standards. Drawbacks of standardisation is that it may block creativity by killing searches for better solutions. Timing and comprehensiveness of standardisation procedures can be key counteracting factors.

Thirdly, Garud, Jain and Kumaraswamy (2000) suggested that common **technological standards**, which are a key facet of the institutional environment of network technological fields, have built in tensions. All standards have enabling and constraining effects, and they are often forged through cooperation among competitors. This process generates temporary, partial agreements

by interdependent parties with private and sometimes diverging interests. The challenge of engendering collective action is further complicated by intertemporal inconsistencies between the initiatives required to mobilize a collective and those needed to maintain it. These tensions make it difficult for a firm to sponsor its proprietary technology as a universal standard. However, a longitudinal study (Anderson and Tushman, 1990) of the cement, glass, and minicomputer industries indicates that when patents are not a significant factor, a technological discontinuity is generally followed by a single standard. However, dominant designs can lag behind the industry's technical frontier. Technological progress may be driven by the combination of chance or variation or the direct actions of stakeholders when selecting between rival industry standards, and the incremental actions by stakeholders. All these more or less vivid features require careful examination.

Fourthly, there are challenges related to **socio-political and ethical-legal aspects of social media**. Among these we can include a need to consider plurality of **ownership** and content and meeting local/national content requirements and standards in the new environment. There are different levels of protection of minors in different countries for instance, but social media has a reach beyond national borders. In such cases not only technical standards matter but how these standards relate to the various cultural contexts and legal traditions.

Fifthly, there are challenges related to new **business models** of social media. The main concern lies in the fact that without a sustainable business model it will be difficult to maintain quality professional journalism in the medium-term. This is so because at this moment the income coming from digital advertisements are not enough to maintain the journalistic structures that we know (with some possible exceptions like the Economist or the NYT). The standard business models are constantly evolving and are not as linear any more as the create–manage–distribute–consume model. Traditional business models have been disrupted by the digital environment that has altered both the production and consumption of media content. Instead of producing content for radio, television or print, today media companies are faced with the need to produce narratives that will be made available on different platforms. Furthermore, reception practices are also undergoing significant changes with receivers consuming an increasing amount of content online. Convergence is therefore altering production, distribution and reception with media companies using digital platforms, namely social media, to reach out to different audiences. Research conducted in several countries has demonstrated that mostly the younger demographics are spending more time online where they have access to audio-visual content

including that produced by traditional newspapers, and television and radio stations. While the situation described above opens up the possibility for media companies to use new technologies to reach out to new audiences, it has also created the need for the development of new business models. For example, the Spanish study (2014) focused on the example of business ventures in the field of sports journalism in Spain. The researchers Rojas, de la Casa and Manfredi observed many models and systems but no uniform criteria could be found. They concluded that new projects generating traditional genres (news, information services) are less innovative in the pursuit of business models. Conversely, the use of different genres (slow journalism) goes hand in hand with models not based only on advertising and sales. Journalists use their own personal brand names (their company or 'byline') as a business and audience driver. Twitter and blogs are part of the strategy. Digital journalism is not a by-product, but the core business in the newsroom. Developing a comprehensive understanding of these phenomena will allow for a more informed discussion on the different policies and pieces of legislation that are being/should be adopted in order to regulate properly social media networks.

Having in mind all these intertwined and complex issues treated within COMPACT further in the paper we shall focus on the characteristics and role of standardization. More particularly **the purpose is to provide an assessment of standardisation activities within convergence and social media, with emphasis on pre-standardisation phase of the processes.** The paper aims to present an overview of already implemented standardisation development processes in the area and describe the role pre-standardisation initiatives have had in those processes. In addition, the information regarding the on-going work from relevant pre-standardisation initiatives active in convergence and social media will be provided. It should be, however, noted that the list of standardisation development processes included in the paper is not exhaustive. This paper is organized as follows. **First**, definition of relevant terms and concepts is provided. **Second**, a brief overview of the assessment of the mobile Web standardisation process conducted by Indrek Ibrus will be presented as an illustration to highlight the conflicts that emerge in digital media-related standardisation negotiation. **Third**, the work from relevant standardisation organizations active on both, European and international level will be presented with focus on the procedures and open access principle in standardization process. **Finally**, an overview of standardisation activities relevant for the project and implemented by the standards developing organizations will be put forward.

The report will structure the broad picture and the next step will be the assessment of the standardization and prestandardization activities from a variety of perspectives (economic, political, legal, cultural) and the coordination of multistakeholders' dialogue as a factor.

Standardization

Standards play a critical role in supporting European policies and legislation. Standardization including prestandardization have been considered “one of the essential prerequisites” to boost science and technological activities to play a strategic role in the construction of a large European market already in the late 80s. (CEC, High technology and prestandardization, 1988)

Standards are vital for interoperability of digital technologies and are highlighted in Digital Agenda as a foundation of an effective Digital Single Market.¹ (EC, 2010:14).

In the strategy Digital Agenda for Europe 2010-2020 (European Commission, 2010), convergence is a recognized underlying feature of current and future media development to which regulation must align itself. Within Pillar 2, Interoperability and Standards' EC promotes rules via guidelines for ex-ante disclosure through The European Commission's Communication on standard-setting rules that was adopted in January 2011: COMMUNICATION FROM THE COMMISSION Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements (Text with EEA relevance) (2011/C 11/01)

Before the Digital Agenda for Europe back in 1988 the Commission of the European Communities adopted a communication with the purpose “to point out the vital role of European standardization in the establishment of a large European market, to show that the already existing structures and procedures of the European Standards Institutions can meet the requirements of advanced technology and promote the timely transfer of research results through the activities of standardization and prestandardization to industry” (CEC, High technology and prestandardization, 1988)

From the outset standardization and prestandardization procedures are seen as the connecting vehicles bridging science and business. Prestandardization plays a supportive role in promoting a better and productive exploitation of the results obtained within research and development programmes.

¹ EUROPEAN COMMISSION (2010) *A Digital Agenda for Europe*. Page 15. August 26th. Available at: [https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0245R\(01\)](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC0245R(01)). Accessed: September 20, 2018.

European standards are developed through one of the three European standard organizations of standardization: the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunications Standards Institute (ETSI). They are officially recognised as providers of European standards by Regulation (EU) No. 1025/2012, and have been working with the European Commission since 1984, when a cooperation agreement was signed.

In general, standards can be established in three ways: through market forces (**de facto standards**), government regulation (**de jure standards**), or **voluntary consensus** (Spring et al., 1995: 221). Early on standards were predominantly developed by de facto standards arising from an uncoordinated process of market based competition between private companies, when a particular set of specifications gained sufficient market share that left other companies with little or no option but to comply if they wanted to enter or remain within a particular market (Hensen, 2008:65).

De jure standards are achieved through government regulation designed by formally established industry committees or formal standards organisations (Steinfeld et al., 2007:163). Over the last two decades, however, the standard development process has been greatly impacted by the rapid technology process resulting in increased voluntary participation in the process by end users (Spring et al., 1995: 222). Thus, for the purposes of this paper and with a view of relating the adoption of standards to the application of multistakeholders' dialogue and coordination we will focus on the **voluntary consensus-based standard development and will use the following definition of standardisation**: "A voluntary cooperation among industry, consumers, public authorities and other interested parties for the development of technical specifications based on consensus" (Guillemin et al., 2013:260).

Before the process of standardisation starts, however, there must be an initiation, i.e. pre-standardisation phase during which the idea of the standard is born based on the needs stemming from market requirements, technology developments and research findings (Söderström, 2004:269). In practice pre-standardisation is a rather important phase of the standard development process. In fact, some argue that pre-standardisation facilitates to bridge the gaps between the research and standardisation; and builds communities around consensus to develop standards (Guillemin et al., 2013:260-261). In addition to these inferences the policy documents of the EC also stress the need for prestandardization as " in many areas standards have to be

agreed “ex ante” because of the complexity of systems which “cannot be defined without a prior agreement on the architectural rules” (CEC, High technology and prestandardization, 1988)

Standardisation processes in EU are still seen as not flexible enough and insufficiently fast in order to respond to ever changing digital technologies (EC, 2016:2-3). Pre-standardisation initiatives are seen as one of the instruments for overcoming those challenges by timely and effectively contributing to the drafting of the standardisation requests by bringing closer opposing opinions and providing the necessary ground for building consensus for a wider use of innovative solutions.

It comes as no surprise to learn that there are numerous pre-standardisation groups created within (and outside) European standard organisations facilitating collaboration among organizations and individuals with the aim to help incubate new standards. For instance, CEN and CENELEC organise their pre-standardisation activities via Ad-hoc Groups (AHGs), while ETSI establishes Industry Specification Groups (ISGs). Being quick and easy to set up, usually short-lived and having the freedom to choose their own working methods, leadership, financing, and types of deliverables – are the characteristics all pre-standardisation groups/ initiatives have in common.

Social media and convergence: terms and concepts

Digital information and communication technologies, often referred to as digital media, are the cornerstone of contemporary information societies (Mansell, 2016:2). The shift from merely retrieving information as was the case in the early stage of WWW, to enabling users to both create and consume information by means of user-friendly interfaces that encourage and facilitate participation (Berthon et al., 2012:263), resulted in digital media becoming a vital part in empowering or disempowering individuals and communities (Mansell, 2016:2). The benefits of digital media range from improving productivity and competitiveness, stimulating political mobilization and social interchange, to democratizing political and social institutions.

Digital media have given rise to what has been later termed “social media” thus transforming broadcast media monologues, i.e. one to many, into social media dialogues, i.e. many to many (Berthon et al., 2012:263). Many refer to social media as user-generated content; however, it is important to differentiate between the media and the users. The media, such are Youtube,

Facebook and Twitter, are the vehicles for carrying content; while the users are the ones who generate the content (Muniz and Schau, 2011, In: Berthon et al., 2012:263). Finally, Kaplan and Haenlein (2010:61) describe social media as “a group of Internet based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content”.

A principal characteristic of digital media is their convergence. While there is still no commonly accepted definition, convergence can be conceived broadly as a phenomenon that “occurs when innovations emerge at the intersection of established and clearly defined industry boundaries, thereby sparking off an evolutionary development with much broader impact” (Hacklin et al., 2009:743). In particular, convergence can be interpreted as: convergence of network infrastructure, seamless interoperability and device based convergence (ETSI, 2018:8). Convergence of network infrastructure assumes a combined network infrastructure which incorporates different telecommunication technologies. Seamless interoperability assumes the existence of distinct network infrastructure which nevertheless can seamlessly interoperate and convergence in this case refers to the definition of the corresponding interfaces and common communication protocols. Device based convergence assumes that convergence takes place exclusively on the user device and devices need to have a multitude of different network interfaces and the ability to connect to different networks at the same time. Finally, convergence is considered as having the potential to improve the delivery of audio-visual media services to mobile devices and create opportunities for new business models, such as individual/ contextual advertising and improved audience tools (ETSI, 2018:8-9).

The forerunners of standardization in digital media: the clash between infrastructure enablers and content providers in Standardization of mobile Web

User experience and access to digital media is shaped through convergence and conditioned by the evolution of underlying technologies. In the eighties, computing and communication networks were understood as an “intersecting path that should result in a convergent network

infrastructure around the standards for the integrated services digital network, but this expectation was not fulfilled. Instead, networks and services evolved using different standards and architectures with major implications for digital media” (Mansell, 2016:7). A decade later, digital media had become the “principal driver of innovations” in digital technologies (Mansell, 2016:7). Efforts made in defining a standard for intercomputer communication resulted in creation of the Internet. Fundamental features of the Internet – networks of intercomputer connections and software-based applications, needed protocols and architectures to support better performance and new services (Mansell, 2016:7). In fact, it was the World Wide Web software developed upon a proposal by Tim Berners-Lee in 1989 that was responsible for the Internet’s explosive growth.

In the mid 2000’s, Tim Berners-Lee as the head of the standards institution World Wide Web Consortium (W3C) engaged in standardisation of the mobile accessible Web. Indrek Ibrus (2013:66-73) provides in his article an insightful analysis of both pre-standardisation and standardisation development process and the network of actors relevant to the development of the mobile Web. The aim of his article was “to investigate in which ways, in the case of the early standardisation of the mobile Web, the different stakeholders have exercised their power to arrive at their favoured design for this platform and what have been the historical alternatives for the evolutionary trajectories of this nascent media and communications platform” (Ibrus, 2013:68). The article has focused on the early evolution of the open mobile Web, specifically its standardisation at W3C. There were numerous institutions involved in establishing technical and economic characteristics for the mobile Web as an emerging media platform: representatives of handset and browser vendors, operators, specific technology and service enablers and content providers. Many of them were involved in standards negotiations (i.e. pre-standardisation phase) at W3C. Ibrus (2012:66) argues that the reasons for their engagement was the shared fear of fragmentation of the mobile domain; varying screen sizes, mark-up languages, browsers and operating systems in use. “The absence of technological continuities that would enable the content and service providers to ‘create once and publish everywhere’, was one of the main motivations for the drive towards standardisation” (Ibrus, 2012:66). However, Ibrus demonstrated the formation of two main industry groups – infrastructure enablers and content providers – within the process of standards negotiations, i.e. pre-standardisation phase. These groups have had different preferred alternatives for the future design of the cross-platform Web. Infrastructure enablers were motivated to work towards converging the mobile and desktop

domains, while content providers were interested in differentiating the domains in terms of their usage functionalities (Ibrus, 2012:72). Dialogic interchange among them has led W3C to compromise; it gradually legitimised discontinuities in the forms of representation and even in the content to be presented. Phenomenon of such contradictory processes, i.e. conflicts that emerge during the pre-standardisation phase could be recognised to continue to this day with mobile web. “Media evolution depends on the specific, usually path-dependent, interests of engaged institutions and on their degrees of freedom when negotiating the design of a medium” (Ibrus, 2012:72).

Standards Developing Organizations

These organizations are the main subjects of the pre and standardization activities. They comprise platforms through which various stakeholders can take part in the multistage process of standard creation. The functions of the organizations are multifarious and encompass developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or generally producing standards.

5.1 European level

European standardization is a consensus-building process that involves many players. As the development of standards is initiated by market needs, industry plays an important role. European Standardization is central to the development and consolidation of the European Single Market. The fact that each European Standard is recognized across the whole of Europe, and automatically becomes the national standard in 34 European countries, makes it much easier for businesses to sell their goods or services to customers throughout the European Single Market. European standards are developed through one of the three European Standards Organizations: the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunications Standards Institute (ETSI). They are officially recognized by Regulation (EU) No 1025/2012² as providers of European

² Regulation No 1025/2012 of the European Parliament and of Council on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing

standards. CEN, CENELEC, and ETSI have been working with the European Commission since 1984, when a cooperation agreement was signed. Revised in 2003, it lays down general guidelines for cooperation.³

CEN is an association that brings together the National Standardization Bodies of 34 European countries. CEN provides a platform for the development of European Standards and other technical documents in relation to various kinds of products, materials, services and processes. CEN's National Members are the *National Standardization Bodies* of the 28 European Union countries, the Former Yugoslav Republic of Macedonia, Serbia and Turkey plus three countries of the European Free Trade Association (Iceland, Norway and Switzerland).

CENELEC is responsible for standardization in the electro technical engineering field. CENELEC prepares voluntary standards, which help facilitate trade between countries, create new markets, cut compliance costs and support the development of a Single European Market. CENELEC creates market access at European level but also at international level, adopting international standards wherever possible, through its close collaboration with the International Electro technical Commission (IEC), under the Frankfurt Agreement. In an ever more global economy, CENELEC fosters innovation and competitiveness, making technology available industry-wide through the production of voluntary standards. Most standardization work within CENELEC is proposed through the CENELEC members. CENELEC's National Members include the *Electrotechnical Committees* of 28 European Union Member States and three Member States of the European Free Trade Association (Iceland, Norway and Switzerland) plus three EU candidate countries (Turkey, the Former Yugoslav Republic of Macedonia and Serbia).

ETSI is a producer of technical standards intended for global use for digital technologies, products and services. ETSI is the recognized regional standards body dealing with telecommunications, broadcasting and other electronic communications networks and services. ETSI has over 800 members from 66 countries and across five continents. Its members include: administrations, administrative bodies and national standards organizations, network operators, manufacturers, users, service providers, research bodies, universities, consultancy companies/partnerships and others.

Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council. October 25, 2012. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012R1025>.

³ https://ec.europa.eu/growth/single-market/european-standards/key-players_en

5.2 International level

The International Organization for Standardization (ISO) is an independent, non-governmental international organization with a membership of 162 national standards bodies. Through its members, it brings together experts to share knowledge and develop voluntary, consensus-based, market relevant International Standards that support innovation and provide solutions to global challenges.

The International Electrotechnical Commission (IEC) provides a global platform where thousands of experts from around the world are able to cooperate to develop the International Standards or conformity assessment services that are needed by industry, regulators and policy makers, testing or research laboratories, academia, investors or insurers. IEC International Standards represent a global consensus of state-of-the art know how and expertise. They incorporate the needs of stakeholders of all participating countries. Every member country represented through its IEC National Committee has one vote and a say in what goes into an IEC International Standard. All UN-recognized countries can apply for IEC membership. Each IEC Member is represented by an NC (National Committee). The NC coordinates all national interests in electrotechnology, representing local industry, governmental agencies, academia, trade associations, end users and national standard developers within the IEC. Each country is responsible for the structure and set-up of its NC.

The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies – ICTs. An organization based on public-private partnership since its inception, ITU currently has a membership of 193 countries and almost 800 private-sector entities and academic institutions. ITU is headquartered in Geneva, Switzerland, and has twelve regional and area offices around the world. ITU membership represents a cross-section of the global ICT sector, from the world's largest manufacturers and telecoms carriers to small, innovative players working with new and emerging technologies, along with leading R&D institutions and academia. Founded on the principle of international cooperation between governments (Member States) and the private sector (Sector Members, Associates and Academia), ITU is the premier global forum through which parties work towards consensus on a wide range of issues affecting the future direction of the ICT industry.

The main products of ITU are normative Recommendations. Recommendations are standards that define how telecommunication networks operate and interwork. ITU-T Recommendations

are non-binding, however they are generally complied with due to their high quality and because they guarantee the interconnectivity of networks and enable telecommunication services to be provided on a worldwide scale.

The World Wide Web Consortium (W3C) is an international community where Member organizations, a full-time staff, and the public work together to develop Web standards. Membership in W3C is open to all types of organizations (including commercial, educational and governmental entities) and individuals. W3C has 476 Members in total.⁴

W3C's primary activity is to develop protocols and guidelines that ensure long-term growth for the Web. W3C's standards define key parts of what makes the World Wide Web work. W3C standards define an Open Web Platform for application development that has the unprecedented potential to enable developers to build rich interactive experiences, powered by vast data stores that are available on any device. W3C develops technical specifications and guidelines through a process designed to maximize consensus about the content of a technical report, to ensure high technical and editorial quality, and to earn endorsement by W3C and the broader community.

Access to the standardization process

Standards are usually prepared by the technical body/ committee within standards developing organizations at the proposal or request of a member country or the European Commission. Each technical body has its own field of operation, i.e. scope within which a work program of identified standards is developed and executed. Technical bodies usually work on the basis of national participation by the standards developing organizations members, where delegates represent their respective national point of view. This allows technical groups to take balanced decisions that reflect a wide consensus.

Once a proposal or request to develop a standard is accepted by the relevant technical body, the member countries are putting all their national activities within the scope of the proposal on hold. This means that they do not initiate new proposal, nor revise existing standards at national level. This obligation is called *standstill* and allows efforts to be focused on the development of the European standard.

⁴ See: <https://www.w3.org/Consortium/Member/List>.

The real standards development is undertaken by experts within working groups which are established within standard developing organization to undertake a specific short-term task within a target date and should normally be disbanded when this is completed. Experts within working groups come together and develop a draft that will become the future standard. This reflects an embedded principle of *direct participation* in the standardization activities. It also signifies the pivotal role of expert involvement and special expertise which trumps political or economic lobbies and preferences.

The main route for businesses or other stakeholders to get involved in standardization is via their respective national standardization organization. All national standardization organizations have the right to participate in the work of technical and working groups within standards developing organizations. Technical body and working group experts are nominated by the national standardization organization (and other members, if applicable) and are appointed by the standards developing organization, but they do not formally represent the members who nominate them which is again a proof of the leading role of expertise in the process. Experts are selected based on their individual know-how and experience in a given subject and therefore act in a personal capacity. However, they should understand the positions of the member that appointed them and keep them informed of progress in the technical work.

To sum up, if one legal entity or an individual wants to participate directly in discussions on new standards, first they should nominate their respective experts or themselves to become members of national technical bodies. Decision on nomination approval/ rejection is up to national standardization organization. Once the respective expert is approved as a member of national technical body, he/ she becomes eligible for nomination and participation in technical bodies and working groups within standards developing organizations.

Finally, the simplest way to access the standardization process is by submitting written comments in response to public consultations on draft standards. Namely, once the draft of the standard is prepared, it is released for public comment and vote. During this stage, everyone who has an interest (e.g. manufacturers, public authorities, consumers, etc.) may comment on the draft. These views are gathered by the members who then submit a national position to standard developing organization.

(Pre) standardization initiatives relevant for the project

In this section of the report an overview of the prestandardization procedures relevant to the project's scope will be discussed. As already emphasized prestandardization procedures serve as a critical node in the science backed research and development processes and economic sectors.

7.1 The European Committee for Standardization (CEN)

Cybersecurity and Data Protection (CEN/CLC/JTC 13)⁵

Cybersecurity and data protection is crucial for the normal functioning of systems in a highly technized interconnected world. On **September 19th 2017 in Brussels** at the premises of CEN-CENELEC a conference discussing the issues took place. This event, jointly organized by the CEN-CENELEC Cybersecurity Focus Group and ENISA, aimed to explore how the standards-developing world is responding to the fast-changing, demanding realms of Cybersecurity, Privacy and Data Protection in the light of the adoption of the GDPR. In particular, the event provided a forum for debate how standards can support European Union legislation and policy. The landscape in these (strictly interconnected) domains is rapidly changing and the European Standardization Organizations need to map how to support the implementation of the new complex framework for Data Protection (GDPR), Network and Information Systems (NIS), Privacy and Electronic Communications Code (ePrivacy Regulation proposal), etc. A conspicuous feature of the forum was its multistakeholderism which is a guarantee for the effectiveness of the standardization processes and the practical implementation of the standards elaborated through policies and legislation.

⁵ Available at:

https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:2307986&cs=1E7D8757573B5975ED287A29293A34D6B

This technical committee is responsible for the development of standards for cybersecurity and data protection covering all aspects of the evolving information society including but not limited to Management systems, frameworks, methodologies; Data protection and privacy; Services and products evaluation standards suitable for security assessment for large companies and small and medium enterprises (SMEs); Competence requirements for cybersecurity and data protection; Security requirements, services, techniques and guidelines for ICT systems, services, networks and devices, including smart objects and distributed computing devices.

In addition, the scope of this technical committee is the identification and possible adoption of documents already published or under development by ISO/IEC JTC 1 and other standards developing organizations and international bodies such as ISO, IEC, ITU-T, and industrial fora. Where not being developed by other standards developing organizations, this committee develops cybersecurity and data protection publications for safeguarding information (and hence the right to information and its free and secure circulation) such as organizational frameworks, management systems, techniques, guidelines, products and services, including those in support of the EU Digital Single Market.

Publications developed by this technical committee are the following:

- Incident investigation principles and processes (ISO/IEC 27043:2015)
- Guidelines for identification, collection, acquisition and preservation of digital evidence (ISO/IEC 27037:2012)
- Information security management systems - Overview and vocabulary (ISO/IEC 27000:2016)
- Information security management systems - Requirements (ISO/IEC 27001:2013 including Cor 1:2014 and Cor 2:2015)
- Security techniques - Code of practice for information security controls (ISO/IEC 27002:2013 including Cor 1:2014 and Cor 2:2015)
- Guidelines for the analysis and interpretation of digital evidence (ISO/IEC 27042:2015)
- Security techniques - Specification for digital redaction (ISO/IEC 27038:2014)

Internet Filtering (CEN/TC 365)⁶

This technical committee has developed and published technical specification “Internet Content and communication’s filtering software and services” with the objective to define a set of criteria

⁶ Available at:

https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:625771&cs=1F652BC44F0DDC3A32C5C992CAE9778AF.

on how Web filters shall perform and shall give Internet users more confidence in choosing a suitable product or service in order to help protecting children online. A product is a software system that is installed by its administrator or its provider. A service is provided without specific installation by the administrator, but by direct provision of the customer by the provider. An example of a product is a software system installed on a personal computer, and an example of a service is an Internet connection filter provided by an Internet Service Provider and added on the Internet access service. By using a Web filter that complies with the requirements set out in this Technical Specification, a user can be confident that the product or service:

- has been specifically designed to meet the needs of parents and carers (administrators of the filter) to protect children from potentially harmful URLs on the Internet;
- has been specifically targeted to minors, and is also suited for individuals looking to protect themselves from potentially harmful URLs on the Internet;
- delivers a minimum set of features and efficacy that are sufficient to provide the required level of protection;
- comes with clear and comprehensive documentation, installation and implementation instructions and available support;
- is reasonably secure, i.e. adopts proven measures to prevent bypassing or removal of the filter itself.

This Technical Specification does not cover the following technologies:

- any kind of email filtering, including: antispam filtering, antivirus analysis of emails and attachments, antiphishing filtering;
- other Web filtering for the purpose of enterprise or adult Web usage, including: antivirus analysis of Web content, antiphishing filtering;
- the analysis and/or filtering of any other application traffic delivered over HTTP/HTTPS/FTP including for instance: instant messaging, peer to peer file (P2P) sharing, VoIP;
- the analysis and/or filtering of any other application traffic delivered over non HTTP/HTTPS/FTP protocols including for instance: newsgroups, instant messaging, peer to peer file (P2P) sharing, VoIP and social networking applications.

Journalism Trust Indicators (CEN/WS JTI)⁷

The ultimate goal of the “Journalism Trust Initiative” is to support the universal, individual freedom of opinion through access to information and independent, pluralistic media. By safeguarding professional standards, a more healthy digital media landscape should emerge, from which each citizen and media worker, but also societies at large, could benefit. Standards here are directed related to and impact human rights, in this case a core fundamental human right – freedom of expression.

In 2018 CEN and JTI organized a workshop to discuss the value of the indicators with relevant stakeholders and particularly with respect to freedom of expression and freedom of the media. The objective of the ‘Journalism Trust Initiative’ (JTI) of RSF is to support the universal, individual freedom of opinion through access to information and independent, pluralistic media as provided by the CFR of the EU. By safeguarding professional standards, a more enabling digital media landscape can be devised in which everybody can benefit from free communication. The scope of the workshop is to outline the operational details to meet that objective in developing the following CEN Workshop Agreements (CWA):

Work Package/CWA I: Identity and Transparency (Tell us who you are.)

Work Package/CWA II: Accountability and Professionalism (Tell us how you work.)

Work Package/CWA III: Independence and Ethics (Tell us what your values are.)

In the multistakeholders format prominent international monitoring and professional organizations engaged in the struggle for broader freedom of expression globally take part. The original Proposer of the Workshop is Reporter sans frontières - Reporters Without Borders (RSF) which is the biggest non-governmental organization publishing the World Press Freedom Index every year supported by Global Editors Network (GEN), European Broadcasting Union (EBU), and Agence France Press (AFP). The consensus outcome of the Workshop will be CEN-CENELEC Workshop Agreement(s) (CWA) expected to be finalized by the end of 2019.

⁷ Available at:

https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:2459281&cs=1A2072729FC90782E9EA944C0E8996FF7.

Industry Best Practices and an Industry Code of Conduct for Licensing of Standard Essential Patents in the field of 5G and Internet of Things (CEN/CLC/WS SEP2)⁸

The scope of this committee is to define a set of recommended best practices for licensing SEPs, in particular to benefit new sectors and verticals poised to recognize the new benefits associated with 5G and IoT adoption. These best licensing practices will aim to foster investment in, and rapid adoption and proliferation of, new and existing technologies enabling the IoT across consumer and enterprise use cases. It is anticipated that such best practices will address, and offer a positive way forward on a variety of issues surrounding SEP licensing including:

- The background and history of the FRAND commitment, and the key competition law concerns requiring fair licensing of SEP technologies.
- The conduct expected of licensors that have made a FRAND promise, and how licensees can and should behave to promote a FRAND outcome to negotiations.
- Use of injunctions following the CJEU decision in the case of Huawei vs. ZTE (case C170/13), the decisions of DG Competition, and the decisions and guidance of other European and international authorities.
- FRAND's requirement of licensing to any and all that seek a license, such as set forth in the ETSI IPR Policy, and how efficiency considerations favor licensing at upstream levels of the supply chain.
- The long history of FRAND licensing at all levels of the supply chain.
- How to determine the value of a standardised technology, and how to separate that from "hold up value" associated with standardisation. As the patent laws have traditionally required, the value of a patent must be based on the technology it expressly claimed therein, and a patent owner cannot seek to exaggerate the value of its patent by focusing on value created by downstream innovators and devices.
- The obligation to license patents without mandatory bundling on a "portfolio only" basis.
- The appropriate application of Non-Disclosure Agreements to protect the confidentiality of sensitive business secrets, while ensuring that other information regarding the FRAND process remains transparent.
- How to resolve licensing disputes efficiently in order to support continued investment in and adoption of wireless cellular technologies and other standardized technologies.

⁸ Available at:

https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:2409601&cs=17E0C367EB849E852A95AA9F3167B830A.

- The role of voluntary arbitration or mediation, balanced with the basic right of access to the courts unless both parties agree to an alternative forum, and
- How to prevent other patent hold up issues and other abuses.

The committee will address these issues also in light of the recent guidance provided by the European Commission's Communication Setting out the EU Approach to Standard Essential Patents. A further objective of the committee will be developing a workable industry Code of Conduct based on the best practices identified by committee participants and considering ways to improve the licensing process. Such a Code of Conduct will benefit not only stakeholders in the SEP licensing ecosystem today, but also new market entrants, promoting the rapid uptake of standardized technologies, furthering interoperability and competition.

European Telecommunications Standards Organization (ETSI)

Media Content Distribution

Many in the industry point to the fact that without interoperability and cross-platform solutions for media distribution that really meet content providers and end users' needs, market figures for digital media distribution may stay what they are today, and investments may well exceed profits by far. TC Media Content Distribution (now closed), was the ETSI technical body in charge of guiding and coordinating standardization work aiming the successful overall development of multimedia systems (television and communication) responding to the present and future market requests on media content distribution. Apart from its economic value such standards will contribute to a the production and dissemination of diverse and catering to a variety of interests and tastes content across platforms and services and hence to enhancing freedom of expression, freedom of communication and creativity.

Standards developed within this technical body:

No.	Standard title.
▪ TR 102 688-9	MCD framework; Part 9: Content Delivery Infrastructures (CDI)
▪ TS 102 990	CDN Interconnection, use cases and requirements
▪ TR 102 688-8	MCD framework; Part 8: Audience Measurement
▪ TR 102 988	Program guide information distribution, situation and perspective
▪ TR 102 989	Subtitles distribution, situation and perspectives

- [TR 102 794](#) 3D Gaming Graphics Delivery Overview
- [TR 102 688-1](#) MCD framework; Part 1: Overview of interest areas
- [TR 102 688-2](#) MCD framework; Part 2: Views and needs of content providers
- [TR 102 688-3](#) MCD framework; Part 3: Regulatory issues, social needs and policy matters

Mobile and Broadcast Convergence

ETSI had established the Industry Specification Group (ISG) on Mobile and Broadcast Convergence (MBC) to produce a comprehensive report exploring the deployment and business models of converged networks from the perspectives of all interested parties, especially including: broadcasters, terrestrial broadcast network operators, mobile network operators, satellite broadcast network operators, content owners/providers, network infrastructure vendors, manufacturers of consumer equipment, and consumers. The potential benefits and challenges from commercial and technical perspectives were taken into account. The requirements supporting delivery of media including linear and non-linear elements over converged networks were specified. The role of the Industry Specification Group excluded development of technical standards and it did not make recommendations about spectrum allocations. However, spectrum authorization models which impact the regulatory framework and/or business model needed to be considered in the work. As a starting point, the ISG reviewed existing, related work in this area and considered the viewpoints of consumers.

The end result was the “Mobile Broadcast Convergence Group Report”⁹. In this document, mobile-broadcast convergence has been considered for the distribution of audio-visual media content and services including linear broadcast radio and TV services. The document assesses the various opportunities and analyses the reasons why previous attempts have not been successful. It also provides a useful reference and a tool for organizations planning such solutions. Current trends and developments in audio-visual media distribution and consumption could significantly change the scene. It was observed that:

- The growing capabilities of mobile devices have remarkably enhanced the user audio and video experience. As a result, users are increasingly consuming and generating video on mobile devices.

⁹ Available at: https://www.etsi.org/deliver/etsi_gr/MBC/001_099/001/01.01.01_60/gr_MBC001v010101p.pdf.

- This contributes to the mounting pressure on mobile networks to accommodate traffic growth in video delivery.
- In recent years, several stakeholders have engaged in R&D activity related to the delivery of live broadcasting to mobile devices and new standards are emerging. For example, several broadcasters have engaged with the 3GPP standardization process in an attempt to ensure future 3GPP networks are suitable for broadcasting Audio Visual content.
- Mergers and acquisitions are occurring between companies in the telecommunications industry, the content industry and the broadcast distribution sector.

The report further identified several technologies that could enable converged deployment opportunities. These deployment opportunities range from caching content to including DTT receiver in handsets, extending the reach of hybrid broadcast broadband, leveraging LTE solutions with several deployment models, to implementing broadcast as a 5G slice.

The aim of the ISG MBC was not to write a specification, but to analyse a variety of methods by which innovative new convergent services might be provided to the satisfaction of end-users.

The report suggests many ways in which this can be achieved. It is likely to require a group of stakeholders from different parts of the industry, committed to a common vision for innovative convergent mobile-broadcast services. This would allow the launch of new services that turn these technology opportunities into benefits to all parties.

International Organization for Standardization (ISO)

Digitally Recorded Media for Information Interchange and Storage (ISO/IEC JTC 1/SC 23)¹⁰

This technical committee is responsible for standardization in the field of removable digital storage media utilizing optical, holographic and magnetic recording technologies, and flash memory technologies for digital information interchange, including: algorithms for the lossless compression of data, volume and file structure, methods for determining the life expectancy of digital storage media, methods for error monitoring of digital storage media. Standards elaborated do not have technical significance only but allow for broader and more secure

¹⁰ Available at: <https://www.iso.org/committee/45240.html>

preparation, circulation and storage of content, higher diversity, creativity and innovation on the web.

Online reputation (ISO/TC 290)

This technical committee is responsible for standardization of methods, tools, processes, measures and best practices related to online reputation of organizations or individuals providing services or products, derived from user-generated content available on the internet.

In the age of social media proliferation user generated content (UGC) is proving to be a powerful ally for social media marketers as claimed by a recent OFFCom survey.¹¹ Customers are becoming increasingly their most prominent brands advocates, sharing photos of their latest purchases Today's consumers and the materials they provide on the web are used to direct marketing. Utilising user generated content is a great alternative and the social media logic is such that consumers trust other consumers' experiences more than direct marketing from brands. The trustful relationships among consumers are usually thoroughly discussed, however, as reported shoppers are now used by social media to form a special group of dedicated buyers or reviewers and thus relying on their personal experience with a product. Apparently the latter serves as a powerful motive for others to buy. In respect to this the reputation of organizations and persons in particular circulating user generated content through the Internet is of great significance – for the successful and trustworthy social media policies and for the protection of the public and its rights.

Excluded:

- privacy and data protection frameworks or security information standardization already covered by ISO/IEC JTC 1/SC 27;
- management system standards already covered by ISO/TC 176/SC 3;
- fraud countermeasures and controls already covered by ISO/TC 247;
- brand evaluation already covered by ISO/TC 289;
- customer contact centres already covered by ISO/PC 273;
- market, opinion and social research already covered ISO/TC 225.

Standards developed by ISO and relevant for the project are the following:

¹¹ Available at <https://www.marketingtechnews.net/news/2015/aug/27/importance-user-generated-content-and-what-brands-need-do-next/>.

- *ISO/IEC TR 20547-2:2018(en): Information technology — Big data reference architecture — Part 2: Use cases and derived requirements.*¹²

This document provides examples of big data use cases with application domains and technical considerations derived from the contributed use cases.

- *ISO/IEC 23009-1:2014(en): Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats*¹³

Dynamic Adaptive Streaming over HTTP (DASH) is intended to support a media-streaming model for delivery of media content in which control lies exclusively with the client. Clients may request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities. Consequently, this part of ISO/IEC 23009 focuses not on client or server procedures but on the data formats used to provide a DASH Media Presentation.

This part of ISO/IEC 23009 primarily specifies formats for the Media Presentation Description and Segments. It is applicable to streaming services over the Internet.

- *ISO/IEC 23000-5:2011(en): Information technology — Multimedia application format (MPEG-A) — Part 5: Media streaming application format*¹⁴

This part of ISO/IEC 23000 specifies a digital item structure, a file format, and references a set of protocols used in a media streaming environment for applications where governed audio and video information is streamed to an end-user device by means of existing protocols such as MPEG-2 Transport Stream or Real Time Protocol over User Datagram Protocols over Internet Protocol (RTP/UDP/IP), and provides informative implementation examples corresponding to specific applications.

- *ISO/DIS 20252(en): Market, opinion and social research, including insights and data analytics — Vocabulary and service requirements*¹⁵

This document establishes terms, definitions and service requirements for service providers conducting market, opinion and social research, including insights and data analytics. Non-market research activities, such as direct marketing, are outside the scope of this document.

¹² Available at: <https://www.iso.org/obp/ui/#iso:std:iso-iec:tr:20547:-2:ed-1:v1:en>

¹³ Available at: <https://www.iso.org/obp/ui/#iso:std:iso-iec:23009:-1:ed-2:v1:en>

¹⁴ Available at: <https://www.iso.org/obp/ui/#iso:std:iso-iec:23000:-5:ed-2:v1:en>

¹⁵ Available at: <https://www.iso.org/obp/ui/#iso:std:iso:20252:dis:ed-3:v1:en>

International Electrotechnical Commission (IEC)

TC 100: Audio, video and multimedia systems and equipment¹⁶

Scope of this technical committee is to prepare international publications in the field of audio, video and multimedia systems and equipment. These publications mainly include specification of the performance, methods of measurement for consumer and professional equipment and their application in systems and its interoperability with other systems or equipment.

Note: Multimedia is the integration of any form of audio, video, graphics, data and telecommunication and integration includes the production, storage, processing, transmission, display and reproduction of such information.

TA 1: Terminals for audio, video and data services and contents¹⁷

Scope of this technical committee is to develop international standards related to consumer electronics equipment for access and use of audio, video and/or data services and content

ISO/IEC JTC 1: Information technology¹⁸

Scope of this technical committee is international standardization in the field of Information Technology. Information Technology includes the specification, design and development of systems and tools dealing with the capture, representation, processing, security, transfer, interchange, presentation, management, organization, storage and retrieval of information.

JTC 1 is the standards development environment where experts come together to develop worldwide Information and Communication Technologies (ICT) standards for business and consumer applications. Additionally, JTC 1 provides the standards approval environment for integrating diverse and complex ICT technologies. These standards rely upon the core infrastructure technologies developed by JTC 1 centers of expertise complemented by specifications developed in other organizations.

¹⁶ Available at: https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP_ORG_ID:1297

¹⁷ Available at: https://www.iec.ch/dyn/www/f?p=103:7:761780552393::::FSP_ORG_ID,FSP_LANG_ID:1429,25

¹⁸ Available at: https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP_ORG_ID:3387

International Telecommunication Union (ITU)

The ITU is not only a technical global organization but recently it has become very active in both technology driven and human rights issues within UN initiatives. According to its mission statement ITU is “committed to connecting all the world's people – wherever they live and whatever their means. Through our work, we protect and support everyone's fundamental right to communicate”. This lays its bearing on all activities under the aegis of ITU which eventually underpin the unhampered implementation of rights globally. ITU helps the establishment of agreement on technologies, services, and allocation of global resources like radio-frequency spectrum and satellite orbital frequencies, “to create a seamless global communications system that's robust, reliable, and constantly evolving” with a view of supporting peoples’ pursuits to exchange, share and debate.

ITU-T Study Group 3: Tariff and accounting principles and international telecommunication/ICT economic and policy issues¹⁹

Study Group 3 is responsible, inter alia, for studying international telecommunication/ICT policy and economic issues and tariff and accounting matters (including costing principles and methodologies), with a view to informing the development of enabling regulatory models and frameworks. SG3 is also tasked with a study on the economic and regulatory impact of the Internet, convergence (services or infrastructure) and new services. SG3 is currently working on a guideline for digital identity under the new Question 9/3 – economic and policy aspects of big data and digital identity in international telecommunications services and networks.

ITU-T Study Group 9: Television and sound transmission and integrated broadband cable networks (Study Period 2017-2020)²⁰

Study Group 9 is responsible for studies relating to use of telecommunication systems for contribution, primary distribution and secondary distribution of television, sound programs and

¹⁹ Available at: <https://www.itu.int/en/ITU-T/studygroups/2017-2020/03/Pages/default.aspx>

²⁰ Available at: <https://www.itu.int/en/ITU-T/studygroups/2017-2020/09/Pages/mandate.aspx>.

related data services including interactive services and applications, extendable to advanced capabilities such as ultra-high definition, 3D, multiview and high-dynamic range television; use of cable and hybrid networks, primarily designed for television and sound-program delivery to the home, as integrated broadband networks to also carry voice or other time-critical services, video-on-demand (e.g. over-the-top (OTT)), interactive services, multiscreen services, etc. to customer premises equipment (CPE) in the home or enterprise.

ITU-T Study Group 16: Multimedia coding, systems and applications (Study Period 2017-2020)²¹

Study Group 16 is responsible for studies relating to ubiquitous multimedia applications, multimedia capabilities for services and applications for existing and future networks. This encompasses accessibility; multimedia architectures and applications; human interfaces and services; terminals; protocols; signal processing; media coding and systems (e.g. network signal processing equipment, multipoint conference units, gateways and gatekeepers).

Lead Study Group Roles:

- multimedia coding, systems and applications
- ubiquitous multimedia applications
- telecommunication/ICT accessibility for persons with disabilities
- human factors
- multimedia aspects of intelligent transport system (ITS) communications
- Internet Protocol television (IPTV) and digital signage
- multimedia aspects of e-services

7.6 The World Wide Web Consortium (W3C)

Authoring Tool Accessibility Guidelines (ATAG) 2.0²²

ATAG 2.0 is a W3C standard (“Recommendation”) that addresses the accessibility of code editors, content management systems (CMS), and other software used to create web content, include

²¹ Available at: <https://www.itu.int/en/ITU-T/studygroups/2017-2020/16/Pages/mandate.aspx>.

²² Available at: <https://www.w3.org/TR/ATAG20/>.

some types of social media websites; and support for production of accessible content by these tools.

In conclusion we can summarize that consistent implementation of standards provide security and stability of work and communication in the Internet world. They can serve as a sound basis for the creation of adequate principles based policy and legislation. The question is what policy and what legislation can best serve the European single market and democracy and whether these values sometimes come in collision. Standards are not only technical norms but in a connected environment have political, economic, policy and cultural implications. The latter have to be explored further in order for to perceive the real value of standards in modern time and how to improve them. Second to this the process of their creation and the path between science and practice has to be a focus of particular attention in order to respond adequately to the dynamic social processes and use widely innovative concepts. In this regards wider involvement of stakeholders, greater transparency and public dialogue will be beneficial.

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