

COMPACT - Convergence and Social Media Awareness Materials Series

EU-funded (completed) projects on Convergence and Social Media

Material supplied by Media 21 Foundation

SOURCE:

<https://ec.europa.eu/digital-single-market/en/programme-and-projects/eu-funded-projects-convergence-and-social-media>

The European Commission funded 27 projects on media convergence and social media. Their main focus is the use of intuitive and innovative ways of interacting with networked multimedia devices and with other services and applications. Anytime, anywhere and on any device. The projects support the increasing convergence between broadband and broadcasting and the interplay of content from various sources. The funding amounts to 98 million euros and aims to sustain the development of digital media, and to accelerate innovation. The objective of the projects is to develop a new generation of media and Internet-based products and services. Projects aim at creating an immersive, interactive and high quality user experience, while the increasing amount of content online requires new forms of accessing and creating content as well as new ways of interacting across different networks, devices and distribution channels. Technology also offers new possibilities for licensing content. The Commission supports projects facilitating the licensing of copyright protected works, such as music, videos or e-books. These projects aim particularly at creating infrastructures allowing for the exchange of standardized information on rights ownership.

Project 3DTV Content Search

<https://cordis.europa.eu/project/id/287674>

Networked Media and Search Systems 3DTVS deals with algorithms and techniques for the analysis, indexing and browsing of 3D television content so that it can be efficiently annotated, stored, searched and retrieved in 3D audiovisual or 3D video content is already being accumulated in 3D television (3DTV) broadcasters and 3D video/cinema production houses. Such content is also being posted in social networks or websites like YouTube. It consists primarily of stereoscopic video and multichannel sound and must be annotated, archived, searched and retrieved. However, it cannot be properly analyzed using algorithms for “2D video” and stereo audio content, or accommodated well within classical audiovisual media archives, because such algorithms and archives do not take into account or exploit information regarding the third dimension (depth). The goal of the 3DTVS project is to devise novel 3DTV audiovisual content analysis, description, indexing, search and browsing methods, and to incorporate such functionalities in 3D audiovisual content archives. The major novelty of the researched approaches is in exploiting 3D (depth) information. Thus, the corresponding archiving system would be able to address user queries of the form ‘find stereo videos with poor/good stereoscopic quality’ or ‘find stereo videos, where actor X actually approaches actor Y in the 3D space’.

As 3DTV emerges, 3DTV content started already being accumulated in 3DTV broadcasters and 3D video production houses. Its volume will soon rise tremendously. Such content already started being posted in the web, as already done for 2D audiovisual material. Furthermore, with the advent of 3D mobile devices, such content is expected to be posted soon in social networks or user-fed audiovisual archives (e.g. YouTube). Such 3DTV audiovisual content consists primarily of stereo, video+depth or multiple views video and multichannel 5.1 or 7.1 sound and must be properly archived, searched and retrieved. However, it cannot be accommodated well within classical audiovisual media archives, because such archives do not exploit depth information, when indexing, searching, retrieving and browsing 3DTV content. Certain tasks, e.g. creation of 3D video summaries and browsing are inherently different in 3D than in 2D content. Therefore, new efficient schemes must be devised for content-based 3DTV audiovisual (AV) content description, indexing, fast search and browsing. The goal of the 3DTVS project is to devise scalable 3DTV AV content description, indexing, search and browsing methods across open platforms, by using mobile and desktop user interfaces and to incorporate such functionalities in 3D audiovisual content archives. The major novelty in 3DTV content indexing/retrieval research will be on how to exploit 3D (depth) information for stereo and multiview video indexing, retrieval and browsing that could address semantic queries of the form 'find stereo videos with shallow depth' or 'find stereo videos, where actor X approaches actor Y'. 3D multichannel audio analysis will perform better audio source (e.g. musical instrument) separation and localization that will be used in 3D audio/cross-modal indexing and retrieval. Multimodal 3D audiovisual content analysis will be built on the results of 3D video and audio analysis. 3DTV content description and search mechanisms will be developed to enable fast reply to semantic queries. User friendly mobile/desktop search interfaces will be built that could also permit adaptation to the user needs and profile. The novel results that will be generated within 3DTVS will:

- reinforce the position of the European ICT and digital media industry in the 3D television sector, by opening wider market opportunities;
- provide greater creativity both to 3DTV professionals and to the average

user, stimulated through technologies and tools to search/exchange professional and user generated 3DTV content, possibly also to be used in immersive and interactive applications;•\tprovide innovative offers to 3DTV content aggregators with tools and interfaces audiovisual 3DTV content consumption.

Project Accessing Dynamic Networked Multimedia Events

<https://cordis.europa.eu/project/id/287872>

Networked Media and Search Systems Unlocking Multimedia Content (Easier Access to Recorded Video Events).

Imagine that you could go back and watch a specific moment in which you and your team came up with an innovative idea, or the exact moment in which you were assigned with an important task. Imagine that you could go back and watch a specific question that was raised during a professional congress, or a lecture that you have missed. Imagine that you could easily skip the parts that are irrelevant to you and hop between the parts that are interesting. Imagine that while trying to learn a new topic, you could easily fetch related lectures and meetings as well as emails, documents and web-links. The vision of inEvent is to make the vast information that is embodied in professional lectures and corporate meetings integrated into your daily work environment. With no need to take manual notes, and no need to remember many details in order to pin-point a meeting or a lecture. And with a friendly web-interface that features personalized experience and social interaction for each and every user.

The main goal of inEvent is to develop new means to structure, retrieve, and share large archives of networked, and dynamically changing, multimedia recordings, mainly consisting here of meetings, video-conferences, and lectures. Several partners of the inEvent consortium have indeed access to (and continuously generate) such large multimedia repositories, which keep being enriched everyday by new recordings, as well as social network data. The resulting resources often share common or related information, or are highly complementary, but also come from different sources, in different formats, and different types of metadata information (if any). Hence, it is still impossible to properly search across those very rich multimedia resources simply based on metadata. Exploiting, and going beyond, the current state-of-the-art in audio, video, and multimedia processing and indexing, the present project proposes research and development towards a system that addresses the above problem by breaking our multimedia recordings into interconnected "hyper-events" (as opposed to hypertext) consisting of a particular structure of simpler "facets" which are easier to search, retrieve and share. Building and adaptively linking such "hyper-events", as a means to search and link networked multimedia archives, will result in more efficient search system, in which information can be retrieved based on "insights" and "experiences" (in addition to the usual metadata). Reaching the aforementioned goal requires challenging RTD efforts going much beyond current state-of-the-art in the fields of knowledge representation, audio processing, video analysis, semantics of information, and exploitation of social network information. Ultimately, the main goal of inEvent could thus be summarized as developing new ways to replace the usual "hypertext" links (linking "information" bits) by multi-faceted "hyper-events" (linking different "experiences/insights" related to dynamic multimedia recordings).

Project BRIDGING THE GAP FOR ENHANCED BROADCAST

<https://cordis.europa.eu/project/id/610691>

Connected and Social media BRIDGET is opening new dimensions for multimedia content creation and consumption by enhancing broadcast programmes with bridgets. A bridget links from the programme you are watching to second screen, interactive media such as web pages, images, audio clips, different types of video (2D, multi-view, with depth information, free viewpoint) and synthetic 3D models. Bridgets can be:

- created automatically or manually by broadcasters, either from their own content (e.g., archives, Internet and other services) or from wider Internet sources;
 - created by end users, either from their local archives or from Internet content;
 - transmitted in the broadcast stream or independently;
 - filtered by a recommendation engine based on user profile, relevance, quality, etc.;
 - enjoyed on the common main screen or a private second screen, in a user-centric and immersive manner, e.g., within 3D models allowing users to place themselves inside an Augmented Reality (AR) scene at the exact location from which the linked content was captured
- To deliver the above, BRIDGET will develop:
- a hybrid broadcast/Internet architecture;
 - a professional Authoring Tool (AT) to generate bridgets and dynamic AR scenes with spatialised audio;
 - an easy-to-use AT for end users;
 - a player to select bridgets, and consume and navigate the resulting dynamic AR scenes.

The AT and player will use a range of sophisticated and innovative technologies extending state-of-the-art 3D scene reconstruction, media analysis and visual search; enabling customised and context-adapted hybrid broadcast/Internet services offering enhanced interactive, multi-screen, social and immersive content for new forms of AR experiences. BRIDGET tools will be based on and contribute to international standards, thus ensuring the creation of a true horizontal market and ecosystem for connected TV and contributed media applications. BRIDGET will open new dimensions for multimedia content creation and consumption by enhancing broadcast programmes with bridgets: links from the programme you are watching to external interactive media elements such as web pages, images, audio clips, different types of video (2D, multi-view, with depth information, free viewpoint) and synthetic 3D models. Bridgets can be:

- created automatically or manually by broadcasters, either from their own content (e.g., archives, Internet and other services) or from wider Internet sources;
- created by end users, either from their local archives or from Internet content;
- transmitted in the broadcast stream or independently;
- filtered by a recommendation engine based on user profile, relevance, quality, etc.;
- enjoyed on the common main screen or a private second screen, in a user-centric and immersive manner, e.g., within 3D models allowing users to place themselves inside an Augmented Reality (AR) scene at the exact location from which the linked content was captured.

To deliver the above, BRIDGET will develop:

- a hybrid broadcast/Internet architecture;
- a professional Authoring Tool (AT) to generate bridgets and dynamic AR scenes with spatialised audio;
- an easy-to-use AT for end users;
- a player to select bridgets, and consume and navigate the resulting

dynamic

AR

scenes.

Project Bringing the Media Internet to Life

<https://cordis.europa.eu/project/id/247688>

3DLife will integrate leading European research groups to create a long-term integration of critical mass for innovation of currently fragmented research addressing media Internet.

The main objective of the NoE are:

- To foster the creation of sustainable relationships between existing national research groups and to start development of a Virtual Centre of Excellence in the field.
- To create sufficient momentum by integrating an existing large number of researchers and resources and to push forward new paradigms on 3D media communication and interaction over the Internet.
- To influence European and world research agenda in several key aspects of 3D Media Internet.

3DLife aims at supporting the creation of a Virtual Center of Excellence in Media Internet and conduct cooperative research in the field. To achieve this goal 3DLife will integrate complementary expertise, enable resource optimization and sharing, and foster research in Media Internet technology. 3DLife addresses wide, Pan-European integration through dedicated activities aiming at sharing laboratory facilities, technological developments and resources, including people. To ensure this wide cooperation and to guarantee that the targeted integrative research profits from, feeds back into, and fosters links with research groups of the 12 new EU member states, a Pan-European Integration Board will be part of the project. The technical and integration goals will be influenced by two other external and independent Boards of Industrial and Scientific Advisors.

Project COnnected Media and Presence from European Institute of Technology

<https://cordis.europa.eu/project/id/611324>

Connected and Social media COMPEIT creates interactive, personalised, shared media experiences on the Internet for feeling more present when interacting remotely with other people and enjoying media together.

Internet-based distribution will transform media broadcasting towards higher levels of interactivity and integration with virtual, mixed and augmented reality.

It will be enabled by new web technologies and a proliferation of devices for audio, video and tangible interaction.

COMPEIT will provide virtual eye contact, augmented reality and other features of mediated presence in an easy to use manner:

- Shared Experience with Tangible Interaction enables audiences to enjoy enhanced live media together, complemented by interactive games.
- Broadcast Presence Studio mixes live media with various types of web-based content.

- Mixed-Reality Interaction is an advanced web service where content generated by the Broadcast Presence Studio service can be mixed into the viewer's physical environment using ambient devices.

There will be open source software and a public experience lab where developers and users can try out next-generation interactive media production and consumption.

COMPEIT creates a web-based system for highly interactive, personalised, shared media experiences. Research and development will link content-delivery networks with tools for enhancing mediated presence. COMPEIT takes the view that Internet-based distribution will transform traditional broadcasting towards higher levels of interactivity and integration with virtual, mixed and augmented reality, enabled by advanced web technologies and the proliferation of audio/video/tangible devices. The project addresses Quality of Experience in flexible, interactive media production and consumption systems designed for professional collaboration and shared leisure activities. It introduces the next step in interactive broadcasting systems by focusing technologies that enrich social connections, improve the feeling of being together in one shared space and enhance collaboration. Modular software will be developed based on low-cost, easily accessible web technologies (e.g HTML5, WebRTC, WebGL), leveraging on cloud based software access and distribution. Three key domains are identified for improving quality of experience

1) Spatial Connectedness

2) Social Connectedness

3) Information Connectedness

COMPEIT develops and validates three key web services:

- a) Shared Experience with Tangible Interaction enables audiences to experience enhanced live media together, complemented by tangible and interactive games

- b) A Broadcast Presence Studio to mix live media with various types of web-based content

- c) Mixed-Reality Interaction, an advanced WebRTC-based service where content generated by the Broadcast Presence Studio service can be mixed into the viewer's physical environment using ambient devices. Prototypes will be validated in an Experience Lab and via an online media distribution platform, complemented by a new national hospital which integrates real-time mediated communication to distributed care centres, private homes and classrooms.

Project Crowd-powered recommendation for continuous digital media access and exchange in social networks

<https://cordis.europa.eu/project/id/610594>

Connected and Social media Recommendation systems based on crowd-sourcing for digital media access and exchange in social networks

Millions of people find the digital media that they want and need via social networks, and rely on recommendations to sort a flood of posts, friends, multimedia and promoted content. Today's users, however, need a new generation of smart recommendations that are able to keep pace with their moment-to-moment needs in their fast-moving, dynamically developing, mobile worlds. Achieving such social smartfeeds requires facing the grand challenge of providing recommendations that are simultaneously real-time, large-scale, socially informed, interactive and context aware. CrowdRec addresses this challenge by pioneering a breed of algorithms that combine crowdsourcing and recommendation algorithms to achieve a new generation of social smartfeeds for access and exchange of digital media in social networks. The key insight of CrowdRec is that, in order to achieve the dense, high-quality, timely

information required for a truly useful social smartfeed, it is necessary to go beyond passive information collection and also beyond users' immediate social circles. Instead, the necessary information can be actively acquired by using crowdsourcing to solicit input and feedback from the wider community. CrowdRec algorithms create a symbiosis between users and content: they establish reciprocal relationships that both satisfy users' digital media needs and connect media with users able and willing to contribute the information necessary to improve access and exchange for the overall community. The project pursues three scientific and technical objectives: "Stream Recommendation": exploiting the ability of recommender system's to process usage patterns to create social smartfeeds useful in large-scale social networks; "Crowd Engagement": designing algorithms that engage users to generate information needed for smartfeeds; "Deployment and Validation": creating a both a reference implementation to support research and a real-world social networks for large-scale user trials. CrowdRec achieves its ambitious goals by bringing academic, industry and SME partners with longstanding expertise in social and context-aware recommendation together with two large social networks with the high volume of media data flowing in live user communities (one > 14 million members and one > 20 thousand members) necessary for "in vivo" development and evaluation of CrowdRec technology.

Project Dynamic Media Service Creation, Adaptation and Publishing on Every Device

<https://cordis.europa.eu/project/id/610404>

Connected and Social media Interoperable technologies for dynamic media service creation, adaptation and publishing in a multi-device and multi-user solution, fostering convergence of TV and Internet across connected devices. MediaScape aims at providing interoperable technologies for the creation and execution of HTML5-based media services that can be distributed seamlessly and in a simultaneous way across any type of connected devices. This solution will enable a natural interaction with media content using the TV together with smartphones, tablets, etc. as second screen devices, fostering the convergence of Television and Internet. In order to avoid having to implement, distribute and maintain complex solutions designed for each target platform, a more versatile solution will allow applications to run across multiple devices and the users will be able to transfer media content from one device to another in an intuitive way. Working with the W3C and liaising with HbbTV and YouView, MediaScape will enable future services that define multi-user and multi-devices media-viewing experiences for millions of Europeans and in a standard-based approach. We are currently witnessing a strong trend towards powerful web-based applications – a trend which is also driving the progress of HTML5 where a wider range of devices are becoming capable of running such applications. However, most applications are running on these devices separated from each other or, at best are only loosely coupled. The growing interest in 2nd-screen solutions within the Connected TV sector clearly shows that users expect a more consistent experience across different devices and their applications. However, to do this, broadcasters and application developers currently need to implement, distribute and maintain a set of rather complex technical solutions tailored to each of the specific target platforms. A more versatile solution would allow the implementation of applications independent from the target devices and the application itself would be able to run across multiple user devices. The user could then smoothly move parts of the functionality from one device to another in an intuitive manner and the application would adapt itself to the device. Essentially, the challenge is to take connected service development to a new level.

MediaScape will lay the foundations for advanced connected multi-user services via a standardised approach integrated into the HTML5 paradigm. The project also seeks to facilitate the marriage of the TV, PC and Mobile worlds through a standard solution that includes real-time delivery and synchronisation of media contents and applications/services across a variety of devices. Working with the W3C and liaising with HbbTV and YouView, MediaScape will enable future services that define multi-user and multi-devices media-viewing experiences for millions of European users, fostering the materialisation of new service concepts and business models, and in a manner that is standard-based and interoperable. Collectively, the project consortium encompasses the knowledge and skills necessary to achieve this objective.

Project *Dynamic Social and Media Content Syndication for 2nd Screen*

<https://cordis.europa.eu/project/id/611312>

Connected and Social media The SAM project enables consumers to "socialise around media", via their second screens, where they are fed with relevant digital content created once and fully syndicated to all for maximum impact.

Today people use "2nd screen" tablets or smartphones while watching their "1st screen" – typically a TV. They engage in activities relating to consumed content on the 1st screen through searches, comments and ratings on social networks. This is non-optimal since 2nd screen apps know little about the 1st screen, little about the context, and controlling apps while watching TV is difficult.

SAM provides a next-generation system for 2nd screen services, which addresses these challenges in a social media context. It is based on "content syndication" where tailored digital content is delivered to the user, ensuring the data reaches the user rather than vice versa.

SAM consumers will receive and provide (prosume) related social & media offerings on their 2nd screen according to their context, and thus find it easier to "socialise around media". A content market place supports media and data owners in syndicating their data, creating richer 2nd screen experiences and content monetisation.

Today's generation of internet devices has changed how users are interacting with media. From passive and unidirectional users to proactive and interactive. Users can comment or rate a TV show and search for related information regarding characters, facts or personalities. They do this with both friends and wider social communities. This phenomenon is known as 2nd Screen. Another coupled phenomenon is Content Syndication, a field of Digital Marketing, where digital content is created once and delivered to different marketing channels at the same time. In today's 2nd Screen environment there are no true standards, protocols or common ways in which users can discover and access information related to consumed contents. Users have to initiate information searches by using eg Google to "participate" in the show. European enterprises wishing to provide services are restricted by a lack of business intelligence that can be applied with a view to profit from and enrich this market. SAM will change this by developing an advanced social media delivery platform based on 2nd Screen and Content Syndication within a Social Media context. Providing open and standardised ways of characterising, discovering, syndicating media assets interactively. Users will prosume digital assets from different syndicated sources and synchronised devices

(e.g. Connected TVs) thus creating richer experiences around media. SAM's innovation is that instead of users reaching for the data; it is the data, which reaches the user through the syndication approach and their 2nd screen. This is based on the creation of dynamic social communities related to the user and digital asset context (e.g. profiles, preferences or devices). SAM will be able to capture and analyse valuable business intelligence which can be used to efficientize and monetarise the process for providers of assets and broadcast material and enrich as well as amplify the process for the consumer. SAM: "Socialising Around Media".

Project European Registries of Rights Information and Orphan Works

<https://cordis.europa.eu/project/rcn/191892/en>

Access to European Rights Information / Registry of Orphan Works

Arrow Plus builds on and further implements the Arrow system, developed within the Arrow project (eContent Plus programme). Arrow is a system to facilitate libraries and other users in their diligent search for rightholders in works that are to be included in a digitisation programme of books, through querying a network of European data sources. Arrow Plus plans to extend the number of countries covered, delivering a genuinely pan-European infrastructure, closing the gap in book data quality between European countries. Arrow Plus will also analyse the extension of Arrow services to the image domain. Interoperability of European book data sources, between countries and between domains - library catalogues, Books in Print (BIP) databases and Reproduction Rights Organisations (RRO) repertoire - is the primary deliverable of the project. Particular attention is paid to the establishment of new book data sources, including BIP and RROs repertoire databases, where these sources do not exist, so to allow a larger number of countries to be covered by the Arrow service. A new technical infrastructure to establish a BIP service in the countries where none exists will represent one direct outcome of the project, as well as the built-in ARROW compliance for the IFRRO Standard software for RROs. The Arrow Plus consortium includes representatives of all relevant stakeholders: libraries, publishers, creators (both writers and visual artists), RROs, photo agencies, and book standards organisations. All are represented at the highest possible level, by the respective European or international organisations in addition to a number of national representatives. Users (libraries, in particular) and data providers (libraries, BIPs and RROs) are also closely involved in the project.

Project Format-Agnostic SScript-based INterActive Experience

<https://cordis.europa.eu/project/rcn/93759/en>

Networked Media and 3D Internet

FascinatE will create an innovative end-to-end system and associated standards for future immersive and interactive TV services. It will allow users to navigate around an ultra-high resolution video panorama, showing a live or recorded event, with matching accompanying audio. The output will be adapted to their particular device, covering anything from a mobile handset to an immersive panoramic display with surround sound, delivering a true personalized multi-screen experience. At the production side, this requires new scene capturing systems, using multiple microphones and cameras with different fields-of-view and

frame rates. These various video signals, together with metadata describing their relative alignment, constitute a novel layered scene representation. From this, any particular portion can be rendered at any desired resolution. This represents a paradigm shift in production technology, from today's format-specific view of an area selected by a cameraman to a format-agnostic representation of the whole scene. This approach is considered to be a more intelligent and future-proof alternative to other approaches, which just increase the resolution of the pictures (e.g. to 8k). Script metadata will describe shot framing as suggested by the supervising director. Rule-based systems will frame these regions in a subjectively appealing manner, taking into account knowledge of how to adapt them to different display sizes, as well as the personal preferences and interactions of the user. Intelligent network components will tailor the transmitted data to suit the screen size and selected view for each terminal. For low-power devices, the component itself will render the desired view, whereas for powerful devices, better performance will be achieved through selectively transmitting portions of the relevant scene layers. At the user terminal, novel interaction methods will allow viewers to choose either a script-driven view or to freely explore the scene themselves

Project Framework for a EU-wide Audiovisual Orphan Works Registry

<https://cordis.europa.eu/project/id/325135>

Europeana and creativity Framework for a EU-wide Audiovisual Orphan Works Registry. The assessment of the rights status for audiovisual works is critical for their re-use in commercial distribution or for cultural and educational purposes, for example in the context of large digitization projects. Unfortunately, the rights status of such works is often unclear and very difficult to assess, making a significant amount of works inaccessible. The most relevant problem, making the whole issue on audiovisual rights in Europa so complicated, is the lack of a solid, structured and EU-wide information resources. FORWARD wants to relief commercial entities, cultural institutions and all potential users of audiovisual work of this complexity by creating an automated system that will search, harvest and process information on audiovisual works. This way, users will be provided with an answer about the rights status of a precise work:

- Is it Orphan?
- Is it in Public Domain?
- Is it in-Copyright?
- Where can the rights be cleared?

This innovative and relevant project aims at a harmonised process in Europe on rights' status definition, allowing a systematised and simplified access to a vast portion of Europe's currently underused or unknown cultural assets. The FORWARD and ARROW systems will be fully compatible and interacting realities, opening the possibility of further integration of Directive 2012/28/EU of the European Parliament and of the Council on certain permitted uses of orphan works was adopted on 25 October 2012. The FORWARD project will be aimed at helping the implementation of the orphan works directive by Film Heritage Institutions. Definitions and workflow established by this Directive and its implementation by Member States will be taken on board by the FORWARD. FORWARD aims at a comprehensive, effective

approach to the complex issue of AV rights assessment and Orphan Works. Main project's goals are to: a) design and implement a EU-wide system to assess rights status (including Orphans) for all types of AV works by federating information resources of multiple national clearing centres; b) foster consensus among all stakeholders on key issues (as definitions of rights statuses, appropriate processes for diligent search, etc) thus facilitating progress on regulatory issues; c) solve interoperability problems among repositories, databases and registries across the EU so that all information required to define rights statuses are automatically harvested and processed; d) enable all stakeholders and users across the EU to assess the rights status of all AV works currently in a 'rights-limbo', thus enhancing access to and usage of a large portion of European AV content; e) establish and maintain a EU-wide Registry of AV Orphan Works and of diligent searches performed. These goals will be achieved by a strong collaboration of large national institutions that hold the largest information resources on AV works in their countries and representatives of all main stakeholders; the project will also build on the extensive expertise and experience of the ARROW projects, thanks to direct involvement of the ARROW project and partners. The FORWARD system will be designed, implemented and tested as a pilot application involving entities from 10 EU countries to be later expanded to all other potential partners in all other EU countries; it will be fully interoperable with ARROW and accessible to queries from all users across the EU. FORWARD will also foster standardization of AV rights metadata across the EU, and set up a structure ensuring that the system is maintained and expanded beyond the end of the project. The FORWARD and ARROW systems will be fully compatible and interacting realities, opening the possibility of further integration. Directive 2012/28/EU of the European Parliament and of the Council on certain permitted uses of orphan works was adopted on 25 October 2012. The FORWARD project will be aimed at helping the implementation of the orphan works directive by Film Heritage Institutions. Definitions and workflow established by this Directive and its implementation by Member States will be taken on board by the FORWARD.

Project Free-viewpoint Immersive Networked Experience

<https://cordis.europa.eu/project/id/248020>

Networked Media and 3D Internet The Free-viewpoint Immersive Networked Experience (FINE) introduces a novel end-to-end architecture for the creation and delivery of Free-viewpoint Content.

The project FINE is focused on the concept of live free-viewpoint content which provides rich and compelling immersive experiences by allowing remote viewers to place a virtual camera in a real live-action scene and move it freely in space and time, heightening their sense of presence and reality.

Both professional and home user scenarios have been considered, and a variety of advances in the acquisition, processing, transmission and exhibition of live free-viewpoint content have been accomplished on several areas; real-time 3D textured geometry reconstruction, view interpolation, tracking and mark-less motion capture and new coding/transmission technologies to allow the synchronized delivery of geometry, imagery and metadata to a wide variety of end-users through New Generation Networks.

The Free-viewpoint Immersive Networked Experience (FINE) project will be focused on researching and developing a novel end-to-end architecture for the creation and delivery of a new form of live media content. FINE will introduce the concept of live free-viewpoint

content which will provide rich and compelling immersive experiences by allowing remote viewers to place a virtual camera in a real live-action scene and move it freely in space and time, heightening their sense of presence and reality. Advances in the acquisition, processing, transmission and exhibition of live free-viewpoint content will be accomplished by focusing the research on four main areas: 1. Fast (real-time) and highly accurate algorithms for smooth view interpolation and photorealistic 3D reconstruction of live events from multiple, high quality live video streams. 2. Real-time tracking and marker-less motion capture of multiple characters. 3. New coding and transmission technologies to allow the synchronized delivery of geometry, imagery and metadata to a wide variety of end-users through New Generation Networks. 4. Integration of the developed free-viewpoint technologies in a networked end-to-end architecture, and their validation in experimental productions. Several user centred scenarios will be defined for both professional and home users. These scenarios will serve as a framework to demonstrate and validate the developed technologies and their usefulness. FINE will have a large impact on several platforms: Internet, broadcast TV, interactive TV, mobile, online video games and digital cinema. Even though the results will be directly applicable to the media industry, they will also have clear benefits for other markets such as teleconferencing, medical imaging, surveillance and security. As part of the outcomes, a multi-view video dataset and a collection of open source tools to manage it will be built and released to the scientific community.

Project Human-enhanced time-aware multimedia search

<https://cordis.europa.eu/project/id/287704>

Networked Media and Search Systems The multimedia search engine with a human touch. No search is the same and no knowledge domain requirements are identical, so how can the full potential of search intelligence be exploited?

How can search computation be boosted with intuition, lateral thinking, conceptual associations, trusted opinions and domain knowledge?

How can multimedia search be provided with time-space coherence?

CUBRIK brings together IT and human intelligence, enhancing the search experience to augment precision and the relevance of results when machine intelligence fails or is unable to remove uncertainty. The approach is not to emulate, but rather to incorporate human and social capabilities, from feature extraction to search and validation of a multimedia content and query processing system.

CUBRIK creates a "white box" version of multimedia content and query processing system.

Multimedia search is enhanced to perform entity-based time and space awareness supported by a knowledge base of spatio-temporal entities (locations, events, trends) correlated with rich semantic associations.

This capability is based on programmable pipelines able to asynchronously schedule machine jobs, crowdsourcing and GWAP-based tasks. Results from different types of activities are reconciled to augment the precision and the relevance of results.

Multimedia search engines today are "black-box" systems. This closed architecture makes it difficult for technology providers, application integrators, and end-users to try out novel approaches for multimedia content and query processing, because there is no place where one can deploy content, components, and processes, integrate them with complementary technologies, and assess the results in a real and scalable environment. The key technical

principle of CUBRIK is to create a "white-box" version of a multimedia content and query processing system, by unbundling its functionality into a set of search processing pipelines, i.e., orchestrations of open source and third-party components instantiating current algorithms for multimedia content analysis, query processing, and relevance feedback evaluation. Examples will be pipelines for extracting metadata from media collections using the software mix that best fits application requirements, for processing multimodal queries, and for analysing user's feedback in novel ways. CUBRIK aims at constructing an open platform for multimedia search practitioners, researchers and end-users, where different classes of contributors can meet and advance the state-of-the-art by joining forces. Important scientific contributions will be the systematic integration of human and social computation in the design and execution of pipelines, and the enrichment of multimedia content and query processing with temporal and spatial entities. On the business side, CUBRIK will endorse an ecosystem where a multitude of actors will concur to implement real application scenarios that validate the platform features in real world conditions and for vertical search domains. The CUBRIK community will bring together technology developers, software integrators, social network and crowdsourcing providers, content owners and SMEs, to promote the open search paradigm for the creation of search solutions tailored to user needs in vertical domains.

Project Hybrid Broadcast Broadband for All

<https://cordis.europa.eu/project/id/621014>

Open objective for innovation The project will show how technology can help to provide more and better TV access services tailored to the users' needs at lower cost in a multilingual Europe

The project HBB4ALL addresses a wide range of accessibility features for a multi-platform media environment - focusing on the hybrid broadcast-broadband TV (HbbTV) concept or Smart TV. The project aims at advancing solutions to future accessibility problems, when HbbTV becomes widespread in Europe.

Understanding interoperability in a multiplatform and multilanguage communication will allow to test easy solutions for media accessibility.

How to watch TV content on PC, tablets, smart phones and TVs with an array of communication solutions such as: subtitling, audio description, clean audio, and many customizable features.

Multiple EU languages, large and small, sign language, and language situation - monolingual, bilingual - will be taken into consideration and also the three translation modes : dubbing, subtitling and voice-over.

The project is also benchmarking quality of access services from a user-centric approach, and will promote accessibility as an added value for education, therapy, and social inclusion.

The project HBB4ALL addresses media accessibility possibilities in the new hybrid broadcast-broadband TV (HbbTV) environment. To turn the accessibility vision into reality, Hbb4All will address all relevant stakeholders and all components of the value chain. One of the prominent challenges of the coming years will be the multi-platform delivery of audio-visual content (anytime, anywhere, any device), be it a broadcast or an Internet service. Hybrid delivery platforms such as connected TVs and two-screen solutions enable a cost-efficient and convenient delivery of access services for those who need them. The elderly and people with various disabilities rely on subtitles, audio description, dialogue enhancement or

sign interpretation. Customizing to personal preferences shall be possible within predetermined limits. The HBB4ALL project builds on HbbTV (from the existing versions 1.1.1 and 1.5 to the version 2.0 that is currently in development) as the major European standard for converged services and looks at both the production and service side. HbbTV provides a straight-forward specification on how to combine broadcast and broadband content plus interactive applications.

The project will test access services in various pilot implementations (from the definition to the operational phase) and gather implicit and explicit user feedback to assess the acceptance and the achievable quality of service in the various delivery scenarios. HBB4ALL is elaborating pertinent guidelines, guides of good practice, metrics, and recommendations and will initiate campaigns to promote the project results. The results of HBB4ALL will be of worldwide relevance and will, through standardisation bodies such as the ITU, also be publicised on a world-wide level. The overall objective of HBB4ALL is to become a major platform/player in the e Inclusion economy currently taking place, fostering the future market take-up while satisfying the diverse interests of all societal groups.

Project Immersive Coverage of Spatially Outspread Live Events

<https://cordis.europa.eu/project/id/610370>

Connected and Social media ICoSOLE will bring events extending over large areas to the audience by combining audio-visual streams captured by professionals as well as by end-users.

Live events such as music festivals or triathlons extend over large areas. Due to economic limitations the coverage of such events by TV stations can only focus on preselected parts, which often come out not to be the most interesting ones. On the other hand several new video camera types (especially such ones with extremely wide fields of view) and personal devices equipped with good quality cameras and audio recording capabilities are available.

ICoSOLE addresses the need for better covering events by combining traditional broadcast technology with new video and audio recording devices as well as personal devices. The project will investigate how the content from different devices can be combined, edited and provided to the viewers by means of traditional broadcast technology but also with web based technology. This will give attendees of the event, but to a bigger extend remote viewers, more choices when watching the event as well as the opportunity to consume the most interesting events in a flexible way.

ICoSOLE aims at developing a platform that enables users to experience live events which are spatially spread out, such as festivals (e.g. Gentse feesten in Belgium, Glastonbury in the UK), parades, marathons or bike races, in an immersive way by combining high-quality spatial video and audio and user generated content. The project will develop a platform for a context-adapted hybrid broadcast-Internet service, providing efficient tools for capture, production and distribution of audiovisual content captured by a heterogeneous set of devices spread over the event site. The approach uses a variety of sensors, ranging from mobile consumer devices over professional broadcast capture equipment to panoramic and/or free-viewpoint video and spatial audio. Methods for streaming live high-quality audiovisual content from mobile capture devices to content acquisition, processing and editing services will be developed. In order to combine the heterogeneous capture sources, ICoSOLE will research and develop approaches for integration of content from professional

and consumer capture devices, including mobile (and moving) sensors, based on metadata and content analysis. Methods for fusing visual and audio information into a format agnostic data representation will be developed, which enable rendering video and audio for virtual viewer/listener positions. ICoSOLE will develop efficient tools for media production professionals to select, configure and review the content sources being used. These tools capture, extract and annotate metadata during the production process and integrate this metadata throughout the entire production chain to the end user. Content will be provided via broadcast, enhanced by additional content transported via broadband and novel interaction possibilities for second screen and web consumption. The content will also be provided in an adapted form to mobile devices, with specific location-based functionalities for users at or near the place of the event.

Project Interoperability of Interactive and Hybrid TV systems - A new advanced scheme for future services and applications in a global environment

<https://cordis.europa.eu/project/id/614087>

EU-Brazil research and development Cooperation Interoperability of Interactive and Hybrid TV systems - An advanced scheme for future services and applications in a global environment.

Situation today Parallel to the switchover from analogue to digital TV, various interactive digital TV systems evolved in various places of the world – some only recently, some already more than a decade ago. The driving idea behind them: to offer consumers additional features and new services. Already today, in many countries, the majority of TV sets sold are Connected TVs which have access to Internet-based services. However, these systems are built upon different approaches and technologies. Applications and add-on service for one platform will generally not work on other systems.

Scope of GLOBAL ITV The scope of this project is to develop an interoperability scheme for the co-existence of multiple interactivity and Connected TV solutions on different Digital TV platforms (such as ISDB-Tb, DVB-S/-T/-C and IPTV). This includes exchanging and using the same information as well as gaining access to the same content sources. We will create solutions to decrease the efforts for adapting services to multiple platforms and to ease access to a global market for all.

Parallel to the switchover from analog to digital Television, various interactive digital television systems have developed in various places of the world - some only recently, some already more than a decade ago. The driving idea was to offer consumers additional novative features and multimedia services. As a result of the broadcast-broadband convergence, most TV sets sold today are so-called Smart TVs or Connected TVs that support the current trend of integration of the Internet into modern television sets and set-top boxes. However, every iTV and Smart TV system has grown on its own technologies, needs and country laws. Applications written for one system are generally not compatible with another system. The World Broadcasting Union has expressed formally (Declaration on Hybrid and Internet Television, November 2011), the advantages of a common platform, although the Union recognizes that the current situation makes very difficult the creation of such a platform by the normal market rules. The scope of GLOBAL ITV project is now to develop an interoperability scheme that allows several iTV and Smart TV systems to work together, exchanging and using the information (be it general or personal). The ultimate aim is to lay

the foundation for a global interoperable platform. Major Brazilian and European companies, organisations and research establishments have decided to join forces. The consortium is convinced to have at its disposal all means to define and showcase a reliable migration path and a coexistence scenario towards a next-generation hybrid TV platform based on established standards. The extensive experience of all partners, and the advice of the international GLOBAL ITV Council, will ensure the definition of viable solutions with direct traction on the market and a clear perspective for the future. The project matches the objectives of the Work Programme for the 2nd Coordinated Call Brazil-Europe, #4: Hybrid broadcast-broadband applications and services.

Project Next-Generation Hybrid Broadcast Broadband

<https://cordis.europa.eu/project/id/287848>

Networked Media and Search Systems Exploring the Future of Connected TV: HBB-NEXT presents novel applications and innovative research You say “hello” and your TV set knows it’s you; it recommends those programmes which you are interested in. Your wife and children join you – the TV is aware of this change of audience and quickly adapts the recommendations to suit your whole family. This is just one feature which has been developed by HBB-NEXT, a European FP7-funded project that takes services and technologies for Internet-connected TVs to a new level. Based on - and augmenting - the European HbbTV standard it has implemented such innovative solutions as

- multi-user identification,
- synchronisation between media streams and devices,
- multi-user recommendations,
- voice and gesture recognition
- user-tailored reputation scores for applications and cloud offloading.

Its new features include: being recognised by the TV for personal or group recommendations, enjoying ULTRA HD extra content on your tablet perfectly synchronised with the football match on TV, voting via the TV screen for your favourite TV show candidate, personalising the appearance of subtitles or sign language interpreter video and more.

Project NUBOMEDIA: an elastic Platform as a Service (PaaS) cloud for interactive social multimedia

<https://cordis.europa.eu/project/rcn/110758/en>

Connected and Social media NUBOMEDIA is an elastically scalable cloud infrastructure specifically devoted to the provision of real-time multimedia services.

The most remarkable problem developer's face when creating real-time multimedia services is complexity. NUBOMEDIA proposition is to minimize complexity by creating a specific purpose cloud platform bringing all the cloud advantages to the arena of real-time interactive multimedia. NUBOMEDIA will be capable of abstracting all the low level details of service deployment, management, and mass-scale exploitation. In addition, all the capabilities shall be exposed through a simple API. Thanks to NUBOMEDIA users shall be able to interact through the media but also to interact with the media. As a result, we shall support traditional conversational person-to-person and group communications usage scenarios, but also person-to-machine (e.g. non-linear interactive media browsing), person-to-media (e.g.

recognizing a face by touching onto it on a smartphone screen) and machine-to-machine (e.g. starting/stopping recording when a specific event occurs) interactions.

Vision: NUBOMEDIA is the first cloud platform specifically designed for hosting interactive multimedia services. Its architecture is based on media pipelines: chains of elements providing media capabilities such as encryption, transcoding, augmented reality or video content analysis. These chains allow building arbitrarily complex media processing for applications. As a unique feature, from the point of view of the pipelines, the NUBOMEDIA cloud infrastructure behaves as a single virtual super-computer encompassing all the available resources of the underlying physical network. Thanks to this, NUBOMEDIA applications can elastically scale and adapt to the required load preserving Quality of Service (QoS) and Service Level Agreement (SLA) guarantees.
Mission: NUBOMEDIA mission is to democratize interactive multimedia communication services by making their creation, deployment and mass-scale exploitation a cheap, rapid and effortless process. To achieve this, we use a strategy composed of two axes. First, NUBOMEDIA exposes its capabilities through a simple to use and intuitive API that can be used by non-expert developers on most popular client platforms such as smartphones and WWW browsers. Second, the NUBOMEDIA infrastructure is released using a flexible and attractive Free Open Source Software license guaranteeing openness and neutrality. **Expected project results:** As a result of this project we expect to create a specification of the NUBOMEDIA architecture and a prototype implementation of it, which should include the latest trends in the area of interactive multimedia: augmented reality, video content analysis, multisensory information support, 3D, immersive audio and flexible social groups communications. The vision and mission will be validated through the creation of four professional vertical demonstrators and a large-horizontal demonstrator based on a social game. To strengthen the NUBOMEDIA impact, we plan to standardize both the architecture and the API

Project REal and Virtual Engagement in Realistic Immersive Environments

<https://cordis.europa.eu/project/id/287723>

Networked Media and Search Systems REVERIE is a revolution in online social networking. It is safe, collaborative, online environment which brings together realistic inter-personal communication and interaction.

REVERIE will bring online social networking into the real-world with interaction and communication based on what people do and say and how they act. In other words, REVERIE will bridge the physical/digital divide, making communication in social networks more reflective of how people interact in the real world. To this end, a key focus in the project's work plan is on developing/integrating multi-modal and multi-sensor signal acquisition tools for capturing, and subsequently representing and recreating both 3D environments and human activities therein.

REVERIE must also focus on how users will experience this interaction and the digital online environment in which it takes place. 3D and immersive audio-visual display technologies have developed to such an extent in recent times that the technology is now considered de rigueur for ensuring the most attractive user experience.

Further, REVERIE intends to bring new dimensions to such experiences, introducing aspects of autonomy into avatar behaviour, and capturing and representing user emotional state as well as physical activity, in order to provide a recreation that is as rich as possible.

It's Friday night, you're exhausted after a long week in the office. You're not going to leave the house so you could watch TV, or spend a few hours catching up on your social networks. But, why spend time watching a screen when you could immerse yourself into a 3D online environment which lets you interact with friends and share common experiences together, in real time, without having to leave home? REVERIE is a revolution in online social networking. It is a safe, collaborative, online environment which brings together realistic inter-personal communication and interaction with 3D media creation. Users can meet, socialise and share experiences using equipment they already have at home – such as 3D TV and Microsoft 3D Kinect – along with a range of content creation tools built for the platform. The possibilities are endless – take your Geography class on a field trip; make an important presentation; attend a distance learning class; play the lead character in your favourite film – then invite your friends to join you using their existing social networking channels. The research challenges are demanding. The focus is the integration of cutting-edge technologies related to 3D data acquisition & processing, sound processing, autonomous avatars, networking, real-time rendering, and physical interaction & emotional engagement in virtual worlds. These challenges are combined into two scenarios that will be used as the basis for technical integration, and which will demonstrate the validity and potential socio-economic benefits of REVERIE's vision for the future of social networking. The work plan for REVERIE has been divided into 3 streams designed to support each other. First, it will go beyond the current state-of-the-art by adapting the latest 3D content creation software to create new tools. Second, to ensure the system is efficient, stable, and meets its objectives, it will test prototypes within existing social networks. Finally, to ensure early adoption of the platform into popular social networks, REVERIE will evaluate, disseminate and exploit the resources created. REVERIE allows social interaction to move beyond the laptop screen, and prevents social media from being restricted to text and images. Friday nights and field trips will never be the same again.

Project REVEALing hidden concepts in Social Media

<https://cordis.europa.eu/project/id/610928>

Connected and Social media Revealing hidden concepts in social media.

The world of media and communication is currently experiencing enormous disruptions: from one-way communication and word of mouth exchanges, we have moved to bi- or multidirectional communication patterns. No longer can a selected few (e.g. media organisations and controllers of communication channels) act as gatekeepers, deciding what is communicated to whom and what not. Individuals now have the opportunity to access information directly from primary sources, through a channel we label 'e-word of mouth', or what we commonly call 'Social Media'. A key problem is that it takes a lot of effort to distinguish useful information from the 'noise' (e.g. useless or misleading information). Finding relevant information is often tedious. This challenge has become the focus of various research efforts. Many concentrate on the automatic discovery of information by adapting semantic search and retrieval technologies to the particularities of Social Media content. REVEAL, however, aims to discover higher level concepts hidden within information. In Social Media we do not only have bare content; we also have interconnected sources. We have to deal with interactions between them, and we have many indicators about the context within which content is used, and interactions taking place. A core challenge is to decipher interactions of individuals in permanently changing

constellations, and do so in real time. This is what we aim for! We will reveal much more than bare content. Further to discovering what is being said, we will determine how trustworthy that information is. We will predict contributor impact and how much or to what extent all this affects reputation or influence. This allows us to automatically judge the quality and accuracy of content, and bring us to predicting future trends with greater accuracy. We label all this Social Media modalities. The core of our work is to reveal hidden modalities for the benefit of a better understanding and utilisation of the Social Media world. The world of media and communication is currently experiencing enormous disruptions: from one-way communication and word of mouth exchanges, we have moved to bi- or multi directional communication patterns. No longer can selected few (e.g. media organizations and controllers of communication channels) act as gatekeepers, deciding what is communicated to whom and what not. Individuals now have the opportunity to access information directly from primary sources, through a channel we label e'-word of mouth', or what we commonly call 'Social Media'. A key problem: it takes a lot of effort to distinguish useful information from the 'noise' (e.g. useless or misleading information). Finding relevant information is often tedious. This challenge has become the focus of various research efforts. Many concentrate on the automatic discovery of information by adapting semantic search and retrieval technologies to the particularities of Social Media content. REVEAL, however, aims to discover higher level concepts hidden within information. In Social Media we do not only have bare content; we also have interconnected sources. We have to deal with interactions between them, and we have many indicators about the context within which content is used, and interactions taking place. A core challenge is to decipher interactions of individuals in permanently changing constellations, and do so in real time. This is what we aim for! We will reveal much more than bare content. Further to discovering what is being said, we will determine how trustworthy that information is. We will predict contributor impact and how much or to what extent all this affects reputation or influence. This allows us to automatically judge the quality and accuracy of content, and bring us to predicting future trends with greater accuracy. We label all this Social Media modalities. The core of our work is to reveal hidden modalities for the benefit of a better understanding and utilization of the Social Media world

Project Sensing User Generated Input for Improved Media Discovery and Experience

<https://cordis.europa.eu/project/id/287975>

Networked Media and Search Systems Enhanced discovery, analysis, retrieval of newsworthy and high-quality content in social media sources to assist news, event professionals to improve the experience of news readers and event goers.

SocialSensor offers technologies for analyzing the activity in social networks with the goal of discovering trending and high-quality content, identifying influencers, sentiment around discussed topics, and establishing links between different online sources. In addition, the project creates new means of retrieving, delivering and presenting media content and information in easily digestible ways and in mobile settings.

The project leverages social networks and user-generated content in two use cases: news and large events. For news, SocialSensor helps journalists and editors quickly discover and validate newsworthy user-generated content and to better understand the trends and public sentiment. It also offers casual readers a serendipitous means of finding online news.

In the case of large events, SocialSensor enhances the experience of event goers with powerful mobile services and supports event organizers for grasping the pulse of their events and leveraging social content and interactions around it.

SocialSensor will develop a new framework for enabling real-time multimedia indexing and search in the Social Web. The project will move beyond conventional text-based indexing and retrieval models by mining and aggregating user inputs and content over multiple social networking sites. Social Indexing will incorporate information about the structure and activity of the users' social network directly into the multimedia analysis and search process. Furthermore, it will enhance the multimedia consumption experience by developing novel user-centric media visualization and browsing paradigms. For example, SocialSensor will analyse the dynamic and massive user contributions in order to extract unbiased trending topics and events and will use social connections for improved recommendations. To achieve its objectives, SocialSensor introduces the concept of Dynamic Social COntainers (DySCOs), a new layer of online multimedia content organisation with particular emphasis on the real-time, social and contextual nature of content and information consumption. Through the proposed DySCO-centered media search, SocialSensor will integrate social content mining, search and intelligent presentation in a personalized, context and network-aware way, based on aggregation and indexing of both UGC and multimedia Web content. The resulting multimedia search system will be showcased and evaluated in two use cases: (a) news, involving professional news editors, journalists and casual readers, benefiting from the improved capabilities of SocialSensor for discovering new interesting social content and integrating it in the news creation and delivery lifecycle, and (b) infotainment, providing new multimedia search tools and unique media consumption experiences to attendants of large events (e.g. festivals). Providing real-time social indexing capabilities for both of these use cases is expected to have a transformational impact on both sectors.

[Project Support Action Towards Excellence in Media Computing and Communication](https://cordis.europa.eu/project/id/287663)
<https://cordis.europa.eu/project/id/287663>

Networked Media and Search Systems EMC2 builds bridges between industry and academia in the field of media computing and communication, enabling industry to exploit current research and researchers to exploit market opportunities.

EMC2 bridges the gap between industry and academia and facilitates the lasting impact of research in media computing and communication (MC2) by projects such as 3DLife and REVERIE

With a focus on 3D media processing for Internet and social networking, VR/AR, computer vision and motion capture, multimedia content analysis, 3D film and video, EMC2's core activities are:

- bringing together MC2 stakeholders, including companies, research centres and researchers;
- academia-industry matchmaking facilitating technology transfer to small and medium sized enterprises (SMEs);
- promoting the entrepreneurial spirit within academia and enabling researchers to acquire the entrepreneurial mind-set and skills;
- enabling industry to help shape European (academic) research agendas in MC2;

- creating and promoting a rich online repository of resources for industry and research, including software and data, teaching materials, contact databases, funding notifications and publication opportunities.

SA-EMC2 is a support action to establish a Centre of Excellence in Media Computing and Communications (EMC2). The main objective of the project is to facilitate the persistence and lasting impact of the NoE 3DLife and the IP REVERIE project achievements, as well as other projects in the field Media Computing and Communications (MC2). The mission of SA-EMC2 is to bring together partners capabilities, knowledge and expertise to facilitate R&D funding through cooperative projects, joint research publication and technology transfer, while advancing the state of the art in MC2. The activities of SA-EMC2 will revolve around the following key objectives:

- Academia – Industry matchmaking
- Technology transfer to SMEs
- Facilitating mentoring, coaching and training towards start-up creation
- Formation of online and physical entrepreneurs camps and summer/winter schools in the MC2 field and entrepreneurial focus
- Formation of PhD courses on the MC2 field and entrepreneurial focus
- Shaping national and European research agendas.

Project Television Linked To The Web

<https://cordis.europa.eu/project/id/287911>

Networked Media and Search Systems Web and TV seamlessly interlinked = LinkedTV
Our vision of future Television Linked To The Web (LinkedTV) is of a ubiquitously online cloud of video content decoupled from place, device or source.

Television existing in the same ecosystem as the Web means that TV and Web content should and can be seamlessly connected, and browsing TV and Web content should be so smooth and interrelated that in the end even “surfing the Web” or “watching TV” will become a meaningless distinction.

To realise this technologically, LinkedTV will provide broadcast and online information (videos, images, text) to TV usable in the same way as text based information is used today in the original Web: interlinked with each other at different granularities, with any other kind of information, searchable, and accessible everywhere and at every time. Ultimately, this means creating Internet-based hypermedia for television.

The result will bring TV and the Web even closer together, and it will open new areas of application for multimedia information.

TV and the Internet are going through an exciting phase of convergence, with TV being delivered on-demand via the Web while access to Web content is ever more a part of the TV experience. The European project "Television Linked To The Web (LinkedTV)" will bring this convergence to its fulfillment, neatly interweaving TV and Web content into a single, integrated experience. The "Networked Media Web" is a vision of a future media landscape in which online devices are ubiquitous and media is stored in and accessed from the 'cloud'. In this future world, television becomes just one more media source next to Web based media and other sources (e.g. home networks, shared private networks, Intranets). Citizens will choose and interact with any media at any time with any device, also switching between content easily and seamlessly. The Social TV revolution happening now shows how people want to enrich their media experience through sharing with friends and interacting during the

programme. Linked TV is the next step, bringing the rich browsing experience people know already from the Web to television, enriching the access to audio-visual programming with associated content and allowing people to seamlessly delve into and browse content within the programme itself at the level of individual objects on screen or things which are mentioned or referred to. To achieve this ambitious goal of uniting the television experience with the Web experience, the LinkedTV project will develop several technologies and tools to analyse and annotate audio-visual content, interlink parts of the content with other content, deliver this enriched audio-visual content via different networks to the end user and provide intuitive user interfaces on the end device to allow easy access to and browsing of related content within the programme. These technologies and tools will be prototyped and tested by a public broadcaster, national media archive and a media arts centre to enrich the TV experience in the contexts of business, environment, cultural heritage and entertainment. As a result, Television Linked To The Web (LinkedTV) will provide every citizen a new, integrated, media experience which is both unlike the Web as we know it today and television as we know it today, yet combining the best of both: quality on-demand audio-visual material enriched with links to other content which is easily accessed and enhancing our networked media experience.

Project User InterACTION Aware Content Generation and Distribution for Next Generation Social TeleVision

<https://cordis.europa.eu/project/id/611761>

Connected and Social media User InterACTION Aware Content Generation and Distribution for Next Generation Social TeleVision

ACTION-TV proposes an innovative mode of user interaction for broadcasting to relax the rigid and passive nature of present broadcasting ecosystems. It has two key aims: (i) a group of users can take part in TV shows providing a sense of immersion into the show and seamless engagement with the content; (ii) users are encouraged to use TV shows as a mean of social engagement as well as keeping them and their talents more visible across social circles. These aims will be achieved by developing an advanced digital media access and delivery platform that enables augmenting traditional audio-visual broadcastings with novel interactivity elements to encourage natural engagement with the content. Mixed-reality technologies will be developed to insert users into pre-recorded content, which will be made 'responsive' to users' actions by ingeniously using a set of auxiliary streams. Potentials of media cloud technologies will be harnessed to personalise ACTION-TV-enabled broadcast content for a group of collaborating users based on their actions. As a result, content producers, for the first time, will be able to generate creative media applications with richer content level user interactivity. Cloud-service providers will be able to monetise their infrastructure through leveraging the increased demand for strategically located in-network media processing. Participating users will be able to share personalised content with their social peers. In this way, end users will have access to more engaging personalised content as well as socialise themselves with community members having common interests. ACTION-TV supports a range of applications from an individual trying out a garment in a TV advert to a group of users interactively attending a TV talent show with the convenience of staying at home. However, ways of utilising the proposed interactivity concept are endless and only limited by the imagination of inspiring content producers. ACTION-TV proposes an innovative mode of user interaction for broadcasting to relax the rigid and passive nature of present broadcasting

ecosystems. It has two key aims: (i) a group of users can take part in TV shows providing a sense of immersion into the show and seamless engagement with the content; (ii) users are encouraged to use TV shows as a mean of social engagement as well as keeping them and their talents more visible across social circles. These aims will be achieved by developing an advanced digital media access and delivery platform that enables augmenting traditional audio-visual broadcastings with novel interactivity elements to encourage natural engagement with the content. Mixed-reality technologies will be developed to insert users into pre-recorded content, which will be made 'responsive' to users' actions by ingeniously using a set of auxiliary streams. Potentials of media cloud technologies will be harnessed to personalise ACTION-TV-enabled broadcast content for a group of collaborating users based on their actions. As a result, content producers, for the first time, will be able to generate creative media applications with richer content level user interactivity. Cloud-service providers will be able to monetise their infrastructure through leveraging the increased demand for strategically located in-network media processing. Participating users will be able to share personalised content with their social peers. In this way, end users will have access to more engaging personalised content as well as socialise themselves with community members having common interests. ACTION-TV supports a range of applications from an individual trying out a garment in a TV advert to a group of users interactively attending a TV talent show with the convenience of staying at home. However, ways of utilising the proposed interactivity concept are endless and only limited by the imagination of inspiring content producers.

Project User-Centric Networking

<https://cordis.europa.eu/project/id/611001>

Connected and Social media The UCN project introduces User Centric Networking, which is a communication new paradigm leveraging user information at large, to deliver novel user-centric connected media services.

The explosion of information available online and the ubiquity of connected media devices are rendering existing content recommendation and content delivery system inadequate. The recent data deluge has made finding relevant content a daunting task. Users are presented with seemingly infinite choices for consumption and because recommendation systems are typically service or application specific and based on little or narrow data, which results in too coarse-grained recommendations. Furthermore, existing content delivery systems focus their media adaptation to match device and network characteristics, instead of users' context and profile that could help increase the relevance of content search and the viewing conditions.

We introduce User Centric Networking (UCN), a new communication paradigm that leverages user information at large to store, discover and deliver content in the most optimal conditions at any time, for a given user in a specific context. UCN relies on a distributed Personal Information Hub (PIH) that contains information such as the user context, her mood, historical data about her taste, expectation, social acquaintances, and her network/device resources. UCN will use these data to decide at any point in time where to search content and where to deliver it from, and how to configure the delivery for a user in her context. In addition, UCN creates opportunities for a new range of personalized services, based on geo-location or fusion of very different sensor data for example.

UCN will deliver prototypes for a new generation of Internet-based applications and services in the digital media sector and beyond. These prototypes will be deployed in Technicolor's Home

Networking product line, designed with real data and tested in real conditions at Portugal Telecom and a NICTA who both use Technicolor's most recent gateway technology.

The explosion of information available online and the ubiquity of connected media devices are rendering existing content recommendation and content delivery system inadequate. The recent data deluge has made finding relevant content a daunting task. Users are presented with seemingly infinite choices for consumption and because recommendation systems are typically service or application specific and based on little or narrow data, which results in too coarse-grained recommendations. Furthermore, existing content delivery systems focus their media adaptation to match device and network characteristics, instead of users' context and profile that could help increase the relevance of content search and the viewing conditions. We introduce User Centric Networking (UCN), a new communication paradigm that leverages user information at large to store, discover and deliver content in the most optimal conditions at any time, for a given user in a specific context. UCN relies on a distributed Personal Information Hub (PIH) that contains information such as the user context, her mood, historical data about her taste, expectation, social acquaintances, and her network/device resources. UCN will use these data to decide at any point in time where to search content and where to deliver it from, and how to configure the delivery for a user in her context. In addition, UCN creates opportunities for a new range of personalized services, based on geo-location or fusion of very different sensor data for example. UCN will deliver prototypes for a new generation of Internet-based applications and services in the digital media sector and beyond. These prototypes will be deployed in Technicolor's Home Networking product line, designed with real data and tested in real conditions at Portugal Telecom and a NICTA who both use Technicolor's most recent gateway technology.

Materials supplied by Media 21 Foundation