"Summary Report on co-organized Events and Impact Assessment"

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Abstract

The general objective of this document is to assess the impact of the activities carried out by Chorus+ in the field of audio-visual search. During the first 11 months of the project, Chorus+ activities have been primarily targeted towards the (co-)organization of events and the dissemination of Chorus+ objectives, in order to foster discussions and encourage international collaborations, industry involvement and the co-operation among EU projects.

In the following we summarize the discussions that took place during the events (co-)organized by Chorus+, we list the dissemination activities performed by the project members and assess the overall impact achieved by the project.

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Executive Summary

D2.4.1 is intended to provide a summary report of Chorus+ co-organized events and assess the impact achieved by the project during the first 11 months of its duration. Apart from a short introduction and the concluding remarks the main body of the document is organized in two sections. Section 2 summarizes the discussions that took place during the events that were co-organized by Chorus+, describes the dissemination tools that are being used by the project and lists a long series of events where members of the Chorus+ team had the opportunity to raise awareness around the project objectives. Section 3, on the other hand, provides some clear indicators witnessing the successful outcome of Chorus+ activities. Aspects like international collaborations, industrial participation are some of these indicators that allow us to be optimistic on the project impact, although still at a rather early stage.

1. Introduction

Chorus+ consortium has been particularly active during the first 11 months of the project by organizing and participating in a series of events related to audio-visual search. In the following we will provide detailed reports for the events that were co-organized by Chorus+ and list the events where the activities of Chorus+ were disseminated via the participation of its members. This will form the ground for performing an overall evaluation of Chorus+ activities during this period and assess its impact in terms of international collaborations, industry participation, etc.

2. Summary report on Events

Chorus+ has been involved in a total amount of 20 events related to different aspect of audio-visual search. 9 of these events were co-organized by Chorus+ in order to foster discussions among the key-players in the field, promote collaborations between industry and academia and outline the landscape of future research trends and benchmarking activities. The other 11 events were used to disseminate Chorus+ activities and increase people awareness on its objectives.

2.1 Events co-organized by Chorus+

In the following we provide useful information and summarize the discussions that took place during the events co-organized by Chorus+. The events are listed in chronological order.

2.1.1 Chorus+ Cluster meeting
February 4th, 2010

The meeting was conducted in Brussels with the participation of 11 persons that acted as representatives for EU-funded projects. This meeting was set-up by Chorus+ with the following main objectives:

- What are the potential technical interactions between all projects involved/interested by Chorus+ listed above?

- What are the actions/topics participants expect the cluster to cover?
- What are the events of joint interest organized in the A/V search domain participants/projects are aware of/involved?

A brief technical presentation for 6 new starting or ongoing projects was given by the corresponding representatives:

CHORUS+ (Henri Gouraud – INRIA): Presented Chorus+ with an emphasis on **Mutualisation** and **sharing** of **Data**, **Analysis** and **Dissemination** of **Evaluation**, **Exchange** and **emergence** of **Knowledge.** In the discussions followed it was pointed out how difficult it

is (will be) to proceed on a system evaluation, taking into account not only metrics, but also user satisfaction. It was agreed that Chorus+ could be used to exchange experiences and avoid fragmentation, overlap between project activities.

LIVING KNOWLEDGE (Francesco De Natale – UNITN, on behalf of Fausto Giunchiglia DISI - University of Trento): Although under FET funding LIVING KNOWLEDGE expressed the intention to participate to the cluster. During its presentation common topics were identified with PetaMedia about emotional analysis and subjective analysis.

GLOCAL (Francesco De Natale – UNITN): During the presentation the following topics were identified as providing good grounds for collaboration: a) common corpora, b) evaluation and comparison, c) media: project will provide media contents and will be glad to discuss with other projects ways of sharing datasets and defining common corpora for testing and benchmarking, e) project has a need for media content, f) user interfaces: ergonomics, visualisation, many dimension, experience from other project can be reused (e.g., Vitalas, Petamedia). The discussion led to an agreement to set-up a session dedicated to standards, addressing common topics, actions needed, and possible coordination.

I-Search (Dimitrios Tzovaras – CERTH): The presentation was focused on the currently available standards (MPEG7, MPEG21 and JPsearch) and their limitations/advantages with respect to searching were mentioned. MPEG7 does not define transform based methods, so projects could contribute to MPEG7. JPsearch: works only for JPEG/2000 pictures. MPEG21 defines some objects that can be used in the context of I-Search. Out of the discussion it became clear that there was an interest that the use cases database, set initially by Chorus, is maintained by Chorus+.

Coast (Theodore Zahariadis – Synelixis): Emphasis was given on the approach adopted by the project to use cache information to locate where the content is. Discussion followed on terminology and functionalities on search engine vs. location engine.

PetaMedia (Martha Larson – TUDelft): PetaMedia invited all A/V Search Cluster members to participate in the MediaEval benchmark evaluation for multimedia access and retrieval (http://www.multimediaeval.org/). All A/V Search Cluster members were pushed to attend the workshop in October if interested in collaborating with PetaMedia on this benchmarking effort (for example by organizing a task related to their project within PetaMedia in 2011).

The technical presentations were followed by the EC consultation for Work Plan preparation (L. Anania - EC project officer). Specifically, it was asked that each project should summarize in 1 page: a) difficult issues tackled by the project, b) the innovative approach they propose. It was pointed out that A/V Search Cluster should have a common action towards ICT for a networking session. Finally, the consultation session was completed by discussing the workplan for objective 1.5 (Networked Media). It was mentioned that three workshops specifically on the future of search engine R&D were conducted in Brussels during 2009. During a one day workshop on January 19th written suggestions were collected from all search engine R&D projects, and four of the best imputes were presented on this day.

2.1.2 Session dedicated to Future Internet Search in Future Internet Assembly
April 2010

The session was held in Valencia – Spain and its goal was to discuss Future Internet Search from a user and SME perspectives. The overall aim was to consider the requirements and research challenges raised by the application of search within different vertical application areas. Another aim was to reflect upon the role that search technologies could play within Future Internet (FI) applications. Primary vertical sectors associated with the FI include health, energy grids, city management, information and content/media and the concrete goals of the session were:

- To identify user needs and unsolved challenges that are important and will require search technologies for solutions, and

- To identify potential FI related applications that require interactive forms of ICT collaboration among users and providers

Petros Daras introduced the session, outlining the overall objectives for the session and a number of key questions to be considered:

1. What search technologies can help citizens and answer urgent needs?
2. What are the main search requirements from an end-user point of view and from a (search service) provider point of view?
3. Why is search so important to everyday Internet access in the context of citizen's everyday life and what needs fixing within the next 5-10 years?
4. Will application domains or socio-economic considerations deliver the right requirements for the FI, or can it be designed without any application in mind?
5. What research challenges associated to search in the specific vertical domain are the most significant?
6. What should an architecture for the FI necessarily contain in order to be able to make the search applications of the future?
7. How can we test and validate the Future Internet core platform/components/architecture? How search is related to this?
8. Your ideas, thoughts or comments on how to progress through FIA and the EU projects in order to make a lasting impact on Future Internet search

Francois Bourdoncle covered the state of the art in multimedia search from the perspective of the QUAERO project and from an Exalead perspective. New functionalities described included the ability to: search for an image containing a face, find images with a particular colour hue, finding specific segments of a video which match a given phrase.
Research challenges raised included:

- Media-specific challenges:
  - High-quality speech-to-text technologies
  - High-quality, general-purpose machine translation
  - Image classification technologies
- Integration of Semantic Web technologies
- Real-time (i.e, online) algorithms
- Application usability challenges
- Video as a pervasive media with search & navigation
- Indexing of all content types (*e.g, Flash, iPad apps, etc.*)

Francois also covered the (partially historical) relationship between search and cloud computing (see below).

Martin Huber described search in health care records along three main themes: Text Search, Knowledge-Driven Semantic Image Search and Data-Driven, Similarity Based Search. The main issues which emerged in the presentation were:

- There is a need for high quality (relevant, up to date, validated/ trusted) and personalized information retrieval both for professionals and self informed patients
- Medical text search is well progressed based on NLP and semantic technologies
- Search in heterogeneous health records requires information extraction from unstructured data and can be supported by semantic and machine learning technologies
- Medical search, especially with respect to multimedia is not suitable to a one-size fits all approach.

Julien Masanes raised a number of issues in his presentation. Firstly, a qualitative change occurs when one mines at web scale. For example, the accuracy of comparison tables (e.g. the height of the highest mountain in each continent) generated from the mining of over 14 Billion pages is very high. He also identifies the following research challenges:

- Building in Europe of an open, neutral and sustainable virtual observatory of the web for research. This requires:

   o large scale crawling, storage and indexing of web data (10+ Petabytes), not limited to text

- Create a baseline distributed analytics services (large scale IE, NLP, distributed and efficient processing and storage).

   o We need to standardize and define baseline in this domain to create a platform for MMSE, social media research etc.

   o Hadoop-style abstractions over internet-wide repository/processing clouds

   o Optimized data placement (partitioning and replication) for analytics

   o Distributed indices

- Temporal indexing of significant characteristics of networked content (from distribution to semantic)

   o Large spectrum of research in IE/IR, network topology etc.

- Make this infrastructure acceptable by society (respect privacy, transparence, IP rights)

Daniel Barthelemy highlighted in his presentation the need for sustainable agricultural development and biodiversity conservation which will be based on accurate knowledge of the identity, geographic distribution, production and uses of plants. He identified many research challenges such as:

- Geometric/topological models for image-based visual features for plant identification
- User's perception of interactive identification tools
- Active multi-class learning for multiple identification criteria
- Interactive similarity based visualization and navigation methods

- Scalability issues related to image-based indexing

- Modelling geographic distribution of plant species and communities

Cedric Ulmer, explained the concept of a Smart City which is about Smart Citizens, Embedded Devices and Prosumers. He also identified the different elements of a Smart City: Smart City Managers, Smart Partners and Smart Platforms (Internet of Things, Internet of Services). Finally, he presented numerous challenges for search in Smart Cities:

- Security and Trust

    o Search engines can aggregate a lot – privacy issues

    o Trust in the answers

- Speed

    o Citizens will adopt the tools if they are fast

- Simplicity

    o Smart City Managers and citizens need search tools with a short learning curve

- Relevance of the search results

- Generation and Visualisation of the results

    o Generate the results based on the query

- Select the best visualisation mechanisms

A panel discussion followed, moderated by **Nozha Boujemma** and **John Domingue** and including all speakers as panelists. The panel topic was "Search and user-in-the-loop; what search technologies can help citizens and answer urgent needs? Why is search so important to everyday internet access in the context of citizen's everyday life and what needs fixing within the next 5-10 years?" . Three key issues came out of the discussions:

- Usability is an important issue – as this determines to what extent search queries can be formulated and reformulated, and how accessible and understandable the results are.
- There's no One size fits all, and the role of SMEs is key for exploiting niche markets. Even within a single application area it is clear that there are different search niches which can be filled with quite different tools. Within the medical sector this landscape has given rise to the emergence of SMEs, each one of which fills a specific search segment.
- Cloud Computing and search – we can see that all the premier league Cloud Computing players have strong ties to search. This set includes: Google, Yahoo, Microsoft and Amazon. The reason for this is that the key technical requirements for Cloud Computing have a significant overlap with the technical requirements associated with Internet scale search, namely:
    o Distributed Storage (e.g, Google's GFS)
    o Distributed Computing (e.g, Hadoop, MapReduce)
    o Scalable semi-structured databases (e.g, Google's BigTable)

Following from the above it was advocated that we should see search not as a type of service or functionality, but rather as a key platform layer on which Future Internet applications can be built. Finally, the main search requirements which were identified are:

- Trust in the search engine.

- Speed and scalability

- Simplicity

- High relevance of the retrieved results.

2.1.3 Chorus+ Workshop "Exploring the Future of Mobile Search"
June 9th, 2010

The "Exploring the Future of Mobile Search" workshop was organized by the Institute for Prospective Technological Studies (IPTS) (part of the Joint Research Centre (JRC) of the European Commission), in the framework of the Chorus+ project. The main objective of the workshop was to gain insights into the techno-economic and socio-economic trends in mobile search and their impact on the European Economy and Society. In particular with respect to the new search services arising from the unique features of mobile devices and mobile environments, e.g. context-aware or location-based services, social (network) search, and interfacing with the "Internet-of-Things".

The workshop was organized to discuss and analyze the following aspects of mobile search:
- **Market Dynamics.** Painting the landscape of mobile search, including the current business models of providers of mobile search and the leading search engines (e.g. strengths, entry barriers, differences amongst them, etc.) and describe their value chain.
- **Future Prospects.** Identifying emerging techno-economic trends, discussing likely developments and future market structure in the domain of mobile search.
- **SWOT Analysis.** Exploring the strengths, the weaknesses, the opportunities and the threats (SWOT) for the Europe Union with respect to mobile search, focusing on economic drivers and the challenges influencing the future of search engines, as well as any other impediments (of regulatory, technical, economic, or social nature) that may hamper successful deployment in Europe.

The workshop was co-located with the 9th Conference of Telecommunication, Media and Internet Techno-Economics (CTTE) and was held on 9 June in Ghent, Belgium. After the keynote speech that was devoted on market opportunities and innovation potential of mobile search, the workshop was organized in three thematic sessions that were meant to gather expert contributions on different aspects of the mobile search eco-system, i) Socio-economic aspects of mobile search, ii) Technologies and interfaces and iii) Services, applications and business models. A round table discussion followed in the second part of the workshop to foster debate around the core technological and techno-economic aspects of mobile search. This roundtable panel discussion was also organized as a Think Tank on Mobile Search (again within Chorus+) with a particular emphasis on technological future trends and directions in mobile search.

Session 1: Socio-economic aspects of mobile search:

José Luis Gómez-Barroso in his talk on **"Exploring the socio-economic logic of mobile search"** placed emphasis on the fact that the adoption of any technological application is dependant on technological maturity, economic feasibility and consumer acceptance. He pointed out the fact that technology is not the (major) barrier for the deployment of the mobile

search applications. Therefore, the take up of mobile search is dependant on socio-economic logics that need further insight.

Karen Church in her speech about **"The future of mobile search is social"** focused on the on the specificity of mobile search, and therefore on the opportunities that this specificity creates. She indicated that when talking about mobile search, some things that should be taken into account are: a) Mobile devices are very personal devices; b) Mobile devices are used in a changing context, which dynamically shapes the user information needs; c) Mobile users tend to seek for "fresh" information; d) Mobile users are not to be studied in isolation, since their behavior is highly social.

Juha Kaario in his talk on **"From location and social search to mixed reality"** questioned how reality can be augmented by electronic devices like mobiles and stressed out the fact that contemporary life is already augmented by the devices we are surrounded with, in a far deeper way than we are used to think.

Session 2: Technologies and interfaces:

Michel Plu in his talk on **"Key differentiating technologies for mobile search"** focused on search-specific technologies and in particular semantic search, context awareness and multimedia multimodal search. These technologies were presented as the key technologies needed to move from retrieving a list of loosely connected results matching the input keyword, to an answer that is constructed to reply to a question by extracting information from available content.

Matt Jones' talk on **"Seeking alternatives: multimodal, social and lazy mobile searching"** challenged the mainstream approach to search, suggesting that humans look for information differently from the way machines retrieve information. Mainstream search is based on a (western-developed world) model of information seeking activities that reduces the human need to get answers to an immediate and discrete need that can be directly formulated in a text-based form. Though this classical approach to search and information retrieval works in a desktop-based environment, it does not fulfill user's needs on the move.

Georg Treu in his talk titled **"Discover, don't search"** focused his presentation on the business and revenue model for mobile search and its selling proposition. He presented a premium service (not advertising, but billing based) that sorts through and proactively notifies users of relevant local content. It provides a platform where location-based service providers and users meet.

Finally, **François Daoust** in this talk on **"Next in mobile search: recommended web standards close by"** focused on the open issues characterizing the mobile search domain and contrasted them with those aspects that are close to being standardized.

Session 3: Services, applications and business models:

Steve Ives talk on **"Mobile search in a touch-centred world"** focused on the market of touch screen phones and devices, i.e. devices that look more or less like the Apple iPhone – 3 inch touch-sensitive screen, high quality browser, usually bundled with some kind of mobile internet tariff – and related devices like the iPod touch which operate on WiFi networks only

and which can run most of the same apps and services. He presented data showing that, despite the global recession, shipments are growing fast, and 45% of all phones that ship in the US, and nearly 50% of the phones that ship in Western Europe will be touch screens in 2010, up from just 16% in 2008 and predicted by Gartner to hit more than 80% by 2013.

Pierre Scokaert in his talk on **"Multimedia search for the mobile web"** promoted the idea of "SNACKING THE WEB" which is based on the following characteristics. The mobile phone is often used to fill idle time. It is always on, close at hand, and it offers various ways to pass time (while waiting for a bus, for instance). One thing users do increasingly, in those spare moments, is to browse the mobile web, which provides them with a perfect source of distraction and entertainment, ideally suited to fill those few minutes. Browsing sessions are generally short and end suddenly. It is therefore key that value (entertainment typically) is provided immediately to the user, so that even the shortest sessions are experienced as positive. This is a typical example of the five-minute web, a web of instant gratification, where content must be found and accessed in minutes or seconds.

Philipp Breuss-Schneeweis gave a talk on **"Searching, finding, navigating with the Wikitude ecosystem"** with main focus on Augmented Reality (AR). Breuss-Schneeweis defined AR as the result of merging the physical real-world environment with virtual computer-generated imagery, creating in this way a mixed reality.

Think-Tank Roundtable discussion:

The workshop concluded with a round table discussion aimed to find out whether there is consensus amongst experts about Mobile Search future trends and directions. This roundtable panel discussion was also organised as a Think Tank on Mobile Search (again within the Chorus+ project) with a particular emphasis on technological future trends and directions in mobile search. The discussion was centred on the following key questions:

• How are mobile information needs changing?
• How are mobile search usage patterns changing?
• What are the main technological and economical challenges ahead?
• Which are the major bottlenecks?
• How is the mobile search market likely to evolve?
• How is Europe placed with regard to the rest of the world?

The discussion was structured by the presentation of the preliminary results of an online survey designed by IPTS to gather experts' views on techno-economic trends and social aspects of mobile search, which are likely to shape the future of this sector [1]. The discussion covered several areas related to parts of the survey [2] and the main issues are summarized below.

Mobile Search: what is it about?

The panel started debating the specificity of mobile search. There was consensus concerning the fact that the mobile device (at least in the developed world) is felt by its user as the most personal and confidential piece of technology. Beyond being the most personal device, the mobile is also always on and always with the user. It was also pointed out during the discussion that once the only mobile devices were phones while this has now changed with netbooks and tablets such as the iPad having entered the category of mobile devices and

enlarging the scope of possible mobile uses. The take-away message was that the distinctiveness of mobile use is hard to model, therefore, a generic definition of what mobile specific is cannot be given, without the risk of being reductionist.

Technology: is it a bottleneck?

According to the findings of the 2010 IPTS survey the main technological bricks enabling mobile search are considered already available. However, to half of the questionnaire respondents the main challenge for the full deployment of mobile search services is still of technological nature. Panelists stressed that user tracking for geo-positioning is not sufficiently fine-grained for optimal service fruition. It was also mentioned that the absence of Europe-wide ubiquitous Wi-Fi infrastructure is also a barrier to the deployment of mobile services. The round table participants agreed that the future of search is likely to be shaped by the capability to levers on the social aspects of both mobile communication and users behaviors.

Privacy: does it constitute a barrier for the development of mobile search services?

Given that relevance is individual-specific, personal data gathering is crucial to provide filtered results that are relevant to the individual. This statement triggered a lively discussion on privacy. Some of the panelists argued that users' attitudes towards privacy are rapidly evolving. It was mentioned that to the digital natives the core of privacy lays in being able to prevent parental intrusion into their profile. Though the availability of personal information for service provision and the related privacy concerns were considered as one of the critical issues for the deployment of mobile search, the panel did not converge to a consensual formulation of the problem and its implication. No consensus was achieved on possible mitigation actions, though a regulatory approach on users' behavior was deemed unlikely to be effective since "there is not much you can do against people disclosing their information" as a participant claimed.

Search Service: how can value be monetised?

According to the 2010 IPTS survey the majority of experts filling out the online questionnaire identify the major challenges for Mobile Search to be in the economics arena. This statement was used to launch discussion on business and revenue models in the domain of Mobile Search. The panel was unanimous in saying that one of the main bottlenecks for the development of EU search market is represented by the absence of data flat rates and data roaming flat rates (or at least of predictable rates). The panel agreed that disruptive business models have not broken through yet. Today's technology enables a paradigm shift in product/service promotion leading to a model where customer engagement is the main key to success. However solutions have to be tailored to the type of service as well as to the target audience. It is unlikely that a single winning revenue model will emerge fittings all business models.

2.1.4 CIVR2010 Practitioner's Day
July 9th, 2010

CIVR 2010 Practitioner's Day was held in Xian in China. The CIVR Practitioner chairs set-up the program in collaboration with the EU Coordinated Action Chorus+. The 2010 edition of the practitioner day addressed the new objectives of Chorus+ project:

- Support the integration and strengthening of the European Research Area by stimulating interaction and co-ordination on an EU level in the area of audiovisual search engines.
- Establish cooperation and coordination to Asian countries (Japan, Singapore and China) together with USA as multimedia search engines topics represent today a global concern which needs a wider cooperation scope than European frontiers. Emergent countries efforts were presented and the possible connections were investigated.

The main relevant points raised by each speaker in the context of multimedia search engines were:

Alejandro Jaimes from Yahoo! Research, SPAIN gave a talk on "What can billions of queries tell us about image search? A human-centered perspective". The talk started with an introduction on several trends in technical (increased connectivity, public data, huge data centers, integrated devices and services), behavioral (computing, on/off line convergence, real time, anywhere) and socio-economic aspects (spread of technology, flat world). The rest of the talk emphasized that in order to address this shift, multimedia retrieval cannot just be about data and features but also about users and their behavior. **Human-centered multimedia** combining user experience, data analysis and human aspects is a very important direction for providing efficient services and applications. The important question is to know **"Who - why - how - how often"** look for images and multimedia content. **User understanding and engagement metrics** are necessary for answering these questions with **context and psychology of user behavior** playing an important role.

Tag-seng Chua, from National University of Singapore gave a talk related to **"NEXT – A joint NUS-Tsinghua centre for extreme search"** that recently established a research center with the objective to extract meaning from millions of real-time data streams. More specific objectives of the centre include, a) Aggregation of cyber-physical to support smart cities, b) Internet scale extreme search for real-time data and sensors, c) Aggregate track and predict events in locations and inform user, d) Extreme databases, e) Multi-sensor analytics, f) Human behavioral analysis and recognition, g) Mobile device analytics for extracting relationships between people.

Xian-Sheng Hua, Microsoft Research Asia, gave a talk on **"How to realize content analysis in web-scale multimedia search"**. The talk presented a number of technologies developed by Microsoft Research and they are already in use in the company's search engine Bing such as, a) Smart video thumbnails, b) Show similar images, c) More sizes, d) Image search by color search.

Masashi Toyoda from University of Tokyo gave a talk on "**Multimedia Web Analysis Framework Towards Development of social analysis software**". Multimedia analysis for Web and TV archives is applied in line with current cross-media and multi-source (e.g twitter & TV) evolution of topics. The addressed applications are sociology, linguistics, marketing, and risk management.

Zhibing Wang presented **"Technical challenges for premium content retrieval at hulu.com".** Hulu.com contains more than 1700 shows and movies, collaborating with 200 content providers. The main objective of Hulu's customers and visitors is to find content

when, where and how they want it. To achieve this both content and user intent understanding are needed. Hulu's content includes structured data with rich metadata, which are better than visual features but still not enough to solve all the problems.

Yiannis Patras from Queen Many, University of London presented **"PETAMEDIA: Multimedia Access in Social Peer-to-Peer networks"**. The goal of PetaMedia is to bring together the research of four national networks in the Netherlands, Switzerland, UK and Germany in the area of multimedia content analysis (MCA) and social peer-to-peer (SP2P) networks and eventually to establish a European virtual centre of excellence.

Alejandro Jaimes from Yahoo! Research, SPAIN gave also a talk on **"Geographic Context in Multimedia Mining"**. Context encompasses several different dimensions: nomenclature (the universal sphere, where concepts and their relationships are represented by a "dictionary knowledge"), domain (where concepts are biased by a specific application scenario), personal experience (the subjective sphere, where contents take a private meaning according to user events and semantics), community experience (the social sphere, where groups of users can share events and semantics).

Yiannis kompatsiaris from CERTH-ITI, GREECE presented the "WeKnowIt" project that is concerned with **"Making the collective intelligence of social media searchable".** WeKnowIt develops scalable technologies for information extraction from user generated data available in Web 2.0 applications and sites. The presentation focused on community detection techniques developed within WeKnowIt, i.e. a process which identifies groups of nodes on large-scale graphs that are more densely connected to each other than to the rest of the network. The ClustTour[1] prototype was demonstrated, which is an online city exploration application that helps users identify interesting spots in a city by use of photo clusters corresponding to landmarks and events.

The presentation were followed by a panel discussion which was centered around a few important questions:
- Is social media and web image/video search the solution to image and retrieval ?
- What are the low-hanging fruits for industry to take away from CIVR'10 ?
- What are the grand challenges that academic researchers can take on in image/video retrieval?
- Which other research and industry communities would CIVR have the most influence over the next 5-10 years?

The main outcome from the presentations and discussions was the need of re-focusing to the user real needs: what are the problems, who the users really are, what is going on to other fields? Scalability issues and whether large-scale data are already considered or not, were also discussed. The usefulness of social media was questioned with opinions coming from both sides in favor of analysis and research in social media and skeptics of such works. HCI and data mining for user understanding together with multimodal fusion and multi-source analysis were identified as promising research areas. Collaboration, coordination, and information exchange between several European initiatives (national, European projects, etc) and between these and the asian efforts were considered essential for raising the awareness of the most effective approaches at the research level, industry and service level but also at the consumer level in the future search engines.

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[1] http://www.clusttour.gr/

2.1.5 ImageCLEF
September 20-23, 2010

Chorus+ was among the organizers of ImageCLEF that was held as a lab at the CLEF conference in September in Padova. 25 groups presented their participation at the image retrieval benchmark and many discussions were held on the techniques and also on evaluation challenges for the future. In total, over 50 persons participated at the ImageCLEF part and almost 200 for all of CLEF. The Chorus+ collaborative wiki was also advertised at this event.

2.1.6 ICPR 2010 contest on information fusion
September 20-26, 2010

At ICPR (International Conference on Pattern Recognition) 2010 a contest was held on ImageCLEF including four tasks of which only three were finally organized as the interactive evaluation foreseen had too few participants. Around 30 people attended the conference and presented their work on the image annotation challenge, a fusion task and a robot vision task. The event was partly organized by Chorus+ members.

2.1.7 Networking session on "Benchmarking multimedia retrieval applications"
September 27-29, 2010

A short introduction into Chorus+ was given by Henning Miller and the importance of benchmarking was emphasized. A strong advertisement for Chorus+ collaborative wiki was also included. Three presentations were given by the invited speakers: a) Nicola Ferro, Padova University, Italy, organizer CLEF, b) Alejandro Jaimes, Yahoo! research, Spain, responsible social networks, c) Allan Smeaton, Dublin city University, oragniser of TrecVID.

Multimedia search is certainly one of the most active and lively areas of the current ICT landscape. At the business level the search function is at the crossing of a large number of industry sectors as embedding service, including - but not limited to - Internet search, portals, mobile services, media & entertainment distribution services, office automation and personal productivity tools and various highly specialized professional applications. Despite the availability of many effective multimedia retrieval methodologies created by the research community, only a handful of commercial products currently incorporate such techniques.

A major barrier to the adoption of these techniques in commercial products and services is the lack of standardised commonly agreed evaluation methodologies to determine the best technique for a given problem. To facilitate the wider use and dissemination of multimedia retrieval research, the evaluation of techniques, the success criteria, together with enabling greater contact between end users, content providers and researchers, is critical. It is also important to improve the comparability between approaches, which will support the discussion between research groups as well as provide an important incitation for commercial use. In the future, search will face several major challenges.

In particular, the increase of efficient information retrieval techniques applicable to all digital media formats, and the use and access of data across heterogeneous platforms (mobile, TV, PC, etc.) will be distinctive features of the future. This session presented a snapshot of the current evaluation landscape in multimedia information retrieval. The scope was two-folded: (1) identify the overseen new dimensions that need to be developed, and (2) conceive and incubate new evaluation paradigms beyond the existing evaluation campaigns, focusing on component-level evaluation; user-centred evaluation; continuous evaluation, and cooperative evaluation. The aim was to show that the current focus in this area is on combining technology, knowledge engineering, and social technologies, to develop theoretical underpinnings for tools to bridge the semantic gap for a larger set of concepts than signal processing alone can deliver and based on problems stemming from the real world. The innovation of multimedia retrieval was stressed, which clearly demonstrates that successful innovation is the result when techno-economic, societal and regulatory aspects are taken into careful consideration together with technological possibilities.

2.1.8 International cooperation on Future Internet: perspectives and roadmap Networking Session
September 29th, 2010

The International cooperation on Future Internet: perspectives and roadmap Networking Session, was held during the ICT 2010 event in Brussels, 27-19 September 2010. The introductory talk on Future Internet (FI) included a general description of FI components, features and applications such as: new ways to do business, usage of virtual and mixed world-environments for meetings, work, play, advertise, eHealth, mixed real and virtual characters. Mobility and mobile devices will play an important role and therefore geo-location services. Other applications include transport and energy, while important requirements for FI are scalability and findability.

One of the important conclusions of the meeting was that many similar activities are organized independently by projects and partners resulting to difficulties in traveling and participation. On the same time, parties outside Europe are confused about EC related activities since there is no "single point of contact" for EC-International collaboration. The main outcomes of the meeting were:
1. To include in the portal of FI a shared diary of events and people attending, list of contacts, knowledge transfer from previous experiences, etc. This way project and people can coordinate for better travelling and event organization.
2. Liaise and share experiences between projects.
3. To prepare a FAQ on international collaboration.

2.1.9 Think Tank on "Social Search"
October 27th, 2010

The Think Tank on "Social Search" was held during the ACM Multimedia conference in Florence (Italy) 2010 with a total number of 30 participants and the general objective to revolve around the following subjects: a) Which search tools for the social networks? b) Do we envision new tools and services to emerge anytime soon? c) Do we envision new applications and services to emerge from the combination of automatic information retrieval and social tagging and comments from the social networks? d) What is the future for real time trend and opinion analysis?

The Think Tank discussion started with a three minute presentation and a brief position statement on the "Social Search" subject by each of the participants. The main tendencies that came out of these presentations can be summarized as follows:

- The importance of the "Social Search" theme being debated, indicating that although social media is seen as the main enabler of advanced information services, several threads and challenges exists, including spam and lack of objectivity.
- Social media should facilitate access to relevant information.
- Specialization towards a reduced set of specific key areas such as for instance Healthcare and Education is foreseen.
- The application of social context and social media in professional environments was often cited
- In addition to the statistical and linguistic methods, several innovative experiences were also reported such as analysis of social relationships in photo albums, use of real time sensors, etc.

The discussion continued with the presentation of the key-note speaker Prof. Jean Veronis who focused his presentation on the maturity of search industry and concluded that with only some years of existence, social networking is still in its infancy. Professor Jean Veronis forecasted the biggest evolution in search technologies since 1990, simply because dramatic changes are taking place in the Web topology.

Finally the Think Tank closed with a round table discussion between the participants. The discussion was driven by the results of an online survey prepared by the Chorus+ team and revolved around the following topics:

- Social search encompasses a wide range of different activities
- With or without privacy social networks will continue to develop
- Will personalization engines narrow down access to information?
- Certifying information: no Trusted authorities but education
- Technologies: social search requires social science

2.1.10 Chorus+ Cluster meeting on Media Search
November 30th, 2010

The objective of the second cluster meeting organized by Chorus+ was to bring together representatives from the majority of the EU-funded projects related to media search, collect their opinions on benchmarking, evaluation and standardization activities and orchestrate their co-operation towards the achievement of common objectives.

2.2 Chorus+ dissemination

2.2.1 Dissemination tools

As the primer tool for disseminating its activities Chorus+ uses its website (http://www.ist-chorus.org/). Latest news, upcoming and past events, important reports and tools for interaction, co-ordination and networking, are some of the things disseminated through Chorus+ website. Figure 1 constitutes the usage summary of Chorus+ website. It is evident that as the project progresses, the interest attracted by the website constantly increases.
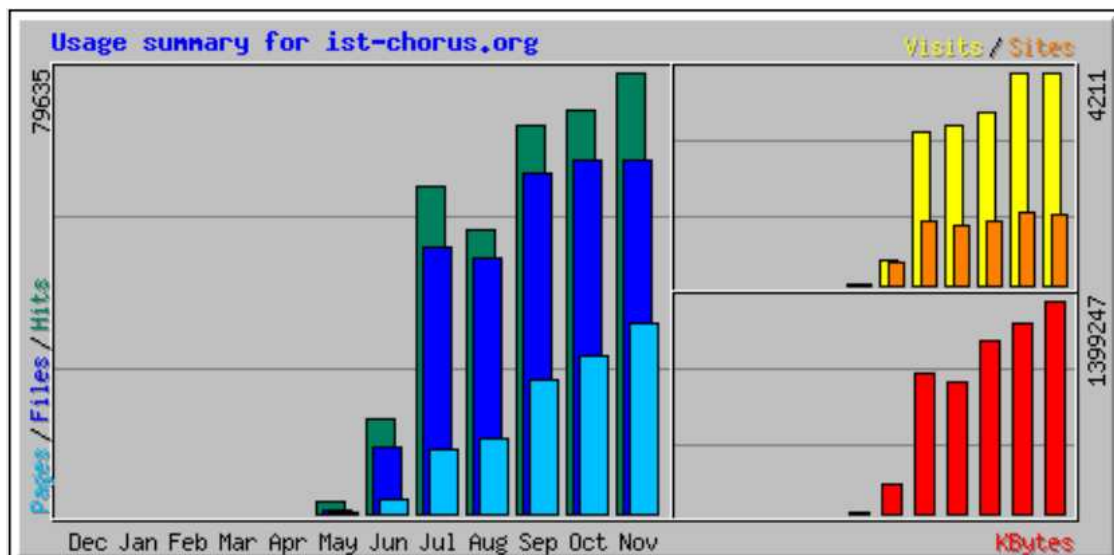

Figure 1. Usage summary for Chorus+ website (ist-chorus.org). It is evident that the interest is constantly increasing as the project progresses.

Moreover, Chorus+ maintains a general scope mailing list (Chorus1@chorus-ist.org; Chorus2@chorus-ist.org; Chorus3@chorus-ist.org) that currently contains approximately 1600 subscribers, allowing to reach a very broad audience. Finally, Chorus+ regularly circulates newsletters that summarize the focus, latest news, activities past and upcoming

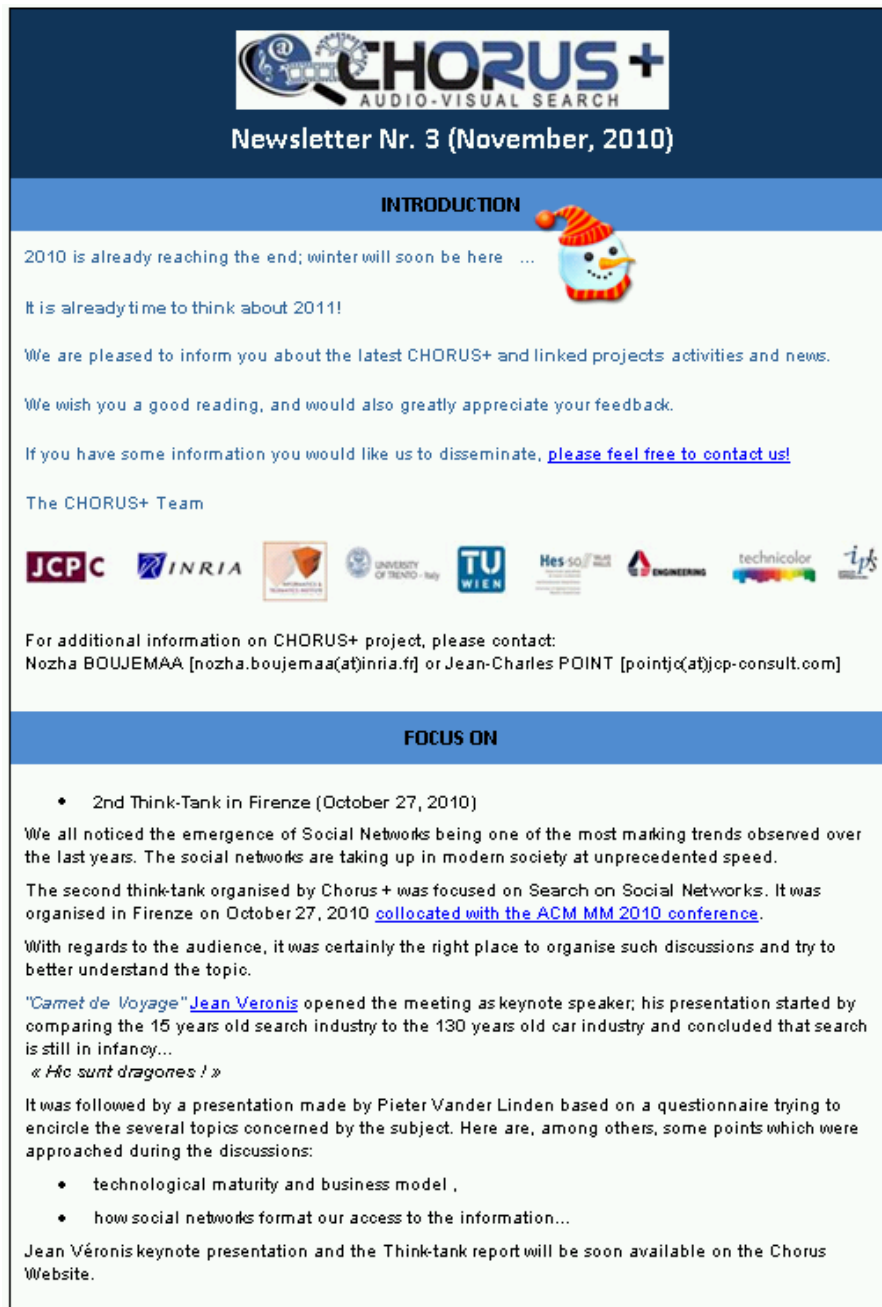events of the project. Figure 2 is an excerpt of our latest newsletter circulated on November 2010.

Figure 2. Excerpt from the last Chorus+ newsletter circulated on November 2010

2.2.2 Dissemination events

During the first 11 months of the Chorus+ project there has been a continuous flow of dissemination actions that advertised Chorus+ activities in a wide range of industrial and scientific audience. Below is a list of the events where the activities of Chorus+ have been disseminated by one of its partners.

Date/Place	Event	Person participated	Dissemination Activity
Sierre, Switzerland, March 22th to 26th, 2010	**SAC 2010** The 25th Symposium On Applied Computing	*Henning Müller, HES-SO*	*Chorus + flyers distribution*
Philadelphia, Pennsylvania, USA, March 29th - 31th, 2010	*ACM MIR 2010, SIGMM International Conference on Multimedia Information Retrieval*	Nozha Boujemaa (INRIA) - *General co-Chair*	*Reported on the growing scientific challenges of social network content analysis and management in diverse papers presentations.*
Valencia, Spain, April 2010	*FIA 2010, Future Internet Assembly*	Adrien Depeursinge (HES-SO)	*Chorus+ advertisement*
Athens, Greece, May 4, 2010	*1st International Workshop on "EVENTS 2010 - Recognising and tracking events on the Web and in real life*	*Ioannis Kompatsiaris (CERTH-ITI)*	*Presentation of Chorus+ project*
Vienna, Austria, May 2010	*IRF 2010*	Henning Muller (HES-SO)	*Chorus+ advertisement*
Tokyo, Japan, June 27-30, 2010	*International Telecommunications Society (ITS) 18th Biennial and Silver Anniversary*	Margherita Bacigalupo (IPTS) , Stavri Nikolov, (IPTS)	*Paper entitled "To Search or not to Search: Where is the Mobile Search Market Heading?"*
Xian, China, July 9th, 2010	*CIVR2010, Practitioner's Day*	*Ioannis Kompatsiaris (CERTH-ITI)*	*Presentation of Chorus+ project*
Geneva, Switzerland, July 2010	*SIGIR 2010, Special Interest Group on Information Retrieval*	Henning Muller (HES-SO)	*Chorus+ advertisement*
Brussels, Belgium, September 29th, 2010	*ICT2010 event, International cooperation on Future Internet: perspectives and roadmap Networking Session*	*Ioannis Kompatsiaris (CERTH-ITI)*	*Presentation of Chorus+ project*

Padova, Italy, September 2010	*CLEF 2010, Conference on Multilingual and Multimodal Information Access Evaluation*	Henning Muller (HES-SO)	*Chorus+ advertisement*
Brussels, Belgium, November, 2010	*Cluster meeting*	Henning Muller (HES-SO)	*Presentation of Chorus+ project*

3. Evaluation of Chorus+ activities & Impact assessment

By organizing and participating in the aforementioned list of events the aim of Chorus+ was to make a substantial impact in the area of audio-visual search engines. Despite the fact that it is difficult to perform impact assessment at this early stage of the project, there are some clear indicators witnessing the successful outcome of Chorus+ activities. The goal of this section is to outline some of the concrete benefits that have been achieved so far.

3.1 Co-operation between EC-funded projects

The creation, maintenance and support of project "clusters" have been adopted by Chorus+ as the main tool to facilitate the co-operation between EU-funded projects. To this end, Chorus+ has taken the responsibility to organize two cluster meetings per year, where project representatives can present their activities and co-operatively work towards the achievement of common objectives.

The first cluster meeting was conducted in Brussels on February 4th, 2010 and attracted 12 persons from 7 EC-funded projects. During the technical presentations of the projects a high number of collaborations have been identified between the participants and common grounds have been found in tackling common problems, i.e., benchmarking, user interfaces, availability of media content, etc.

The second Chorus+ cluster meeting has been held on November 30th, 2010, with special focus on firstly "Evaluation and benchmark" and secondly "standardization overview and needs". The meeting gathered 30 persons representing 10 EC-funded projects and external representatives (QUAERO, ETSI, MPEG, JPSearch and W3C).

3.2 International Collaborations

One very positive aspect of the events organized by Chorus+ was that they managed to attract a significant number of participants coming from countries outside EU. For instance in "Practitioners' day" event that was organized in the context of CIVR2010, the majority of presenters were researchers from outside EU (i.e., USA, China, Japan, Singapore, etc). Similarly, the Think Tank on "Social Search" was attended by people from 12 different countries, 4 of which outside the EU. During these events there have been extensive discussions, exchange of ideas and good practices between the participants, fostering the establishment of international collaborations.

Another activity that was promoted by Chorus+ and resulted in the establishment of international collaborations was the co-organized networking sessions. For instance the networking session on "Benchmarking multimedia retrieval applications" that was held in the context of ICT2010, brought together two of the major players conducting scientific competitions (i.e., TRECVIF and CLEF) that discussed next steps and investigated potential collaborations.

Particularly important was the networking session on "International cooperation on Future Internet: perspectives and roadmap" that was also organized in the context of ICT2010, with the participation of many international representatives. Figure 3 shows the international contacts per country per project. During this session it was pointed out that many similar activities are organized independently by projects and partners resulting to difficulties in traveling and participation. On the same time, parties outside Europe are confused about EU related activities since there is no "single point of contact" for EU-International collaboration. To alleviate this effect it was decided to publish a shared diary of events and people attending, list of contacts, knowledge transfer from previous experiences, allowing project and people to coordinate for better travelling and event organization. Moreover, a consensus was reached on creating the necessary infrastructure to liaise and share experiences between projects, as well as to prepare a FAQ on international collaboration.
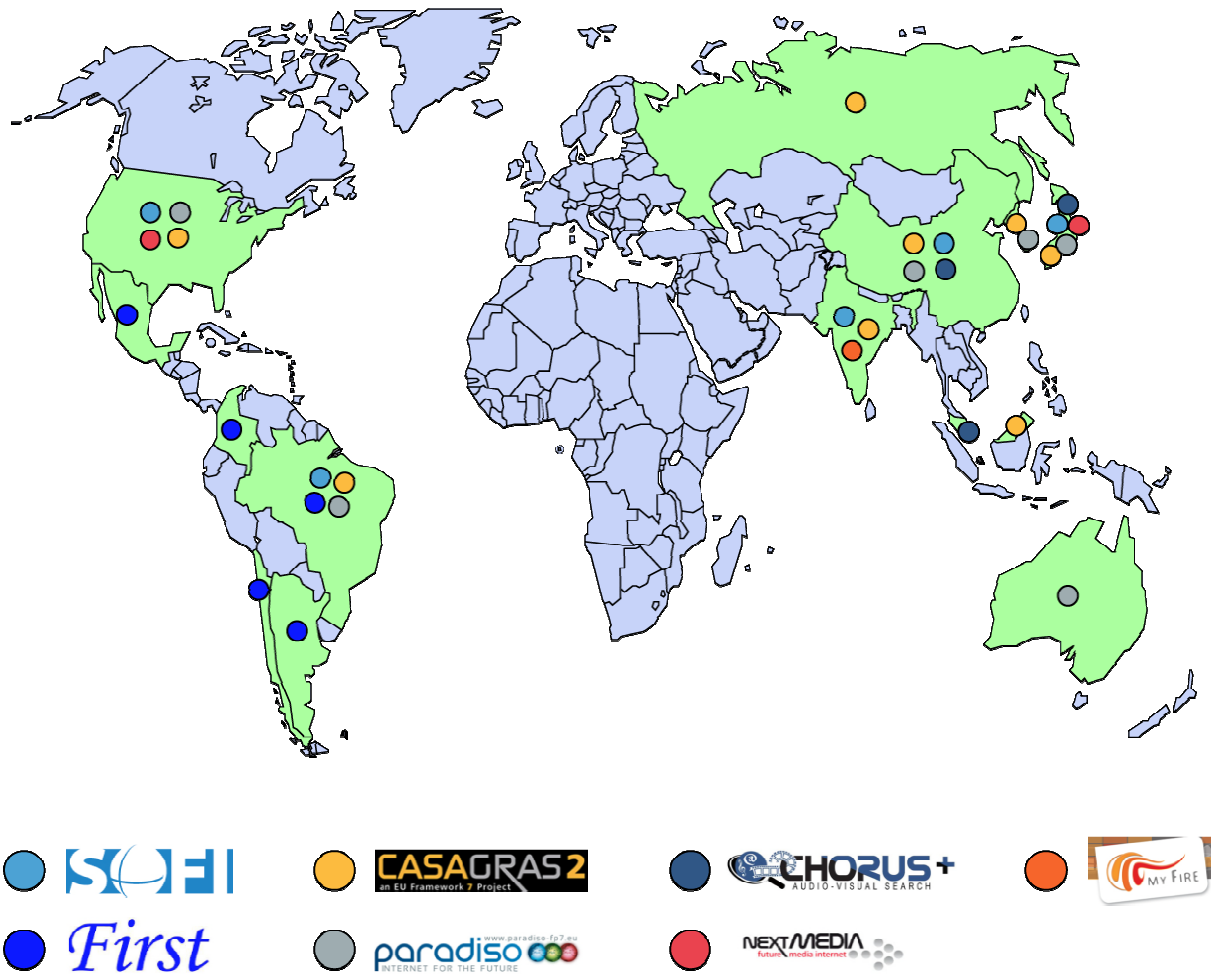
Figure 3. International contacts/activities per country per project.

3.3 Industrial participation

The participation of industrial organizations holding a key-role in the area of audio-visual search has been primarily achieved by personally inviting them to participate in the Think Tanks organized by Chorus+. Most of the contacted companies have responded positively on the invitations send by the Chorus+ team which resulted in the organization of two Think Tanks with high industrial participation. More specifically, the Think Tank on "Mobile Search" was attended by 12 companies very actively involved in the market of mobile search. The companies had the opportunity to demonstrate their products, share the challenges that they are facing and present their opinion on the prospects and new opportunities of mobile search. Particularly interesting has been the round table discussion that followed the presentations, which was driven by the outcome of an on-line survey related to mobile search. A similar structure has been adopted for the second Think Tank on "Social Search" were personal invitations were send to key-players in the field. As in the previous case the Think Tank attracted a high number of industrial participants that had the opportunity to present their products and exchange ideas with researchers in the field.

3.4 Impact on specific sectors

The strategic decision of Chorus+ to periodically focus on specific sectors of audio-visual search, allowed its team to produce specialized reports for these sectors. More specifically, it was decided that all Think Tanks (TT) should target on a clear objective rather than a more general scope, allowing to conduct specialized surveys. This was the case for the sectors of "**Mobile Search**" and "**Social Search**", that have been the main subject of interest for TT1 (June 9th, 2010) and TT2 (October 27th, 2010), respectively.

Concerning "Mobile Search" the findings of a survey conducted using an on-line questionnaire along with a detailed report on the discussions that took place during the TT1 event are now published under [2]. A similar report will soon been published for the "Social Search" sector as the outcome of TT2 event, as well as for the sectors of "Music Search" and "Enterprise Search" that constitute the target subjects of the two upcoming TT events. Given that these reports summarize the views/ideas/expectations of recognized experts, they are expected to have a strong impact in the respective sectors.

4. Conclusions

In concluding this summary report of Chorus+ co-organized events and impact assessment, we can claim that the overall impact achieved by the project is constantly growing and spread in different aspects of audio-visual search (industrial participation, international collaborations, etc). It is evident that the intense activities of Chorus+ members resulted in the establishment of a wide network of people, with special focus/interest of audio visual search, willing to collaborate, share ideas and explore new opportunities. As of primer importance we classify the "Think Tank" meetings, where we have seen industry and academia to creatively debate on the prospects and opportunities of Mobile and Social Search.

5. References

[1] Gómez-Barroso, J.-L., Compañó, R., Feijóo, C., Bacigalupo, M., Westlund, O., Ramos, S., et al. (2010). Prospects of mobile search EUR 24148 EN. Seville: Institute for Prospective Technological Studies. European Commission.

[2] Notes of the Exploring the Future of Mobile Search Expert Workshop 9th June 2010, Het Pand, Ghent, Belgium

(http://www.ist-chorus.org/index.php?article_id=107&page=116&action=article&)

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