# PHAROS - The multimedia search engine platform

Bruxelles, 27 May 2009

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# Partners and project key data
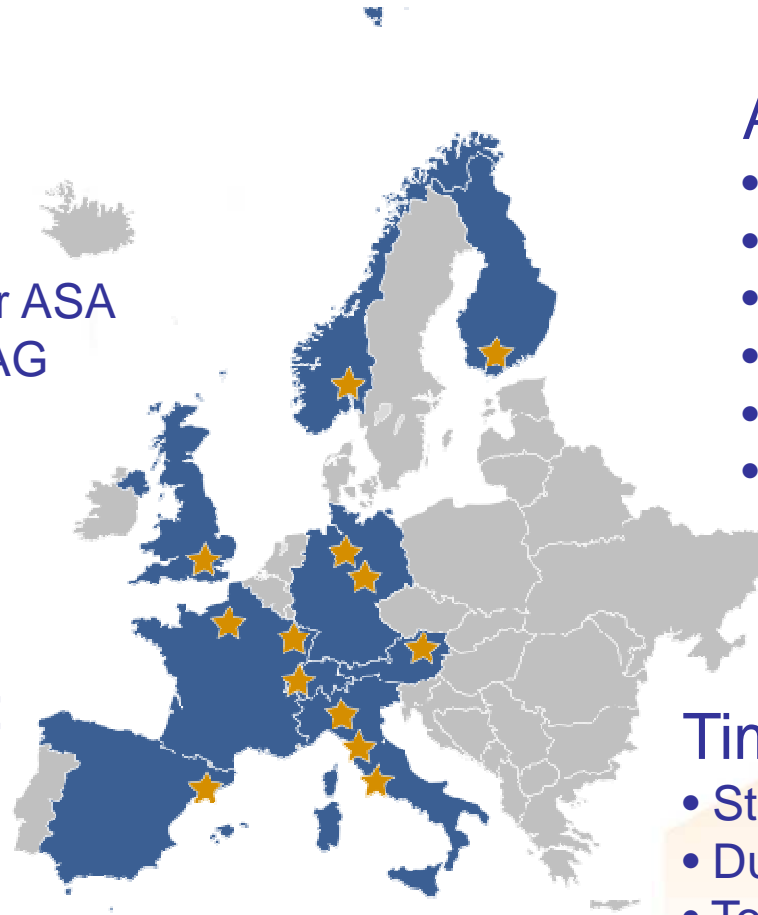
## Industry:
- Engineering Spa
- Fast Search & Transfer ASA
- Sail Labs Technology AG
- Webmodels Srl

## Content and Service Providers:
- France Telecom
- Circom Regional

12 partners from 9 countries

## Academia:
- L3S Research Centre
- Fraunhofer IDMT
- EPF Lausanne
- Open University, KMI
- University Pompeu Fabra
- VTT Research Centre

## Timescale and budget:
- Start January 2007
- Duration 36 months
- Total budget: €14.2m
- EC contribution: €8.5m

# PHAROS is not Google (1)

- "**Search**" is not limited to everyday experience of *googling* the web but it is now a must feature of business intelligence applications for the enterprise

- "**Multimedia**" : a combination of text, audio, still images, animation, video, and interactivity content into a single form.

- "**Multimedia Search**" requires implementation of a mental model of information structure

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# PHAROS is not Google (2)

- in Google (e.g. photos) multimedia search only works if someone has previously "tagged" the objects, so Google knows what to search for.

- PHAROS analyses the Multimedia content, automatically extracts features from it  and associates them to it  as "rich media" representations, which make the content contextually searchable
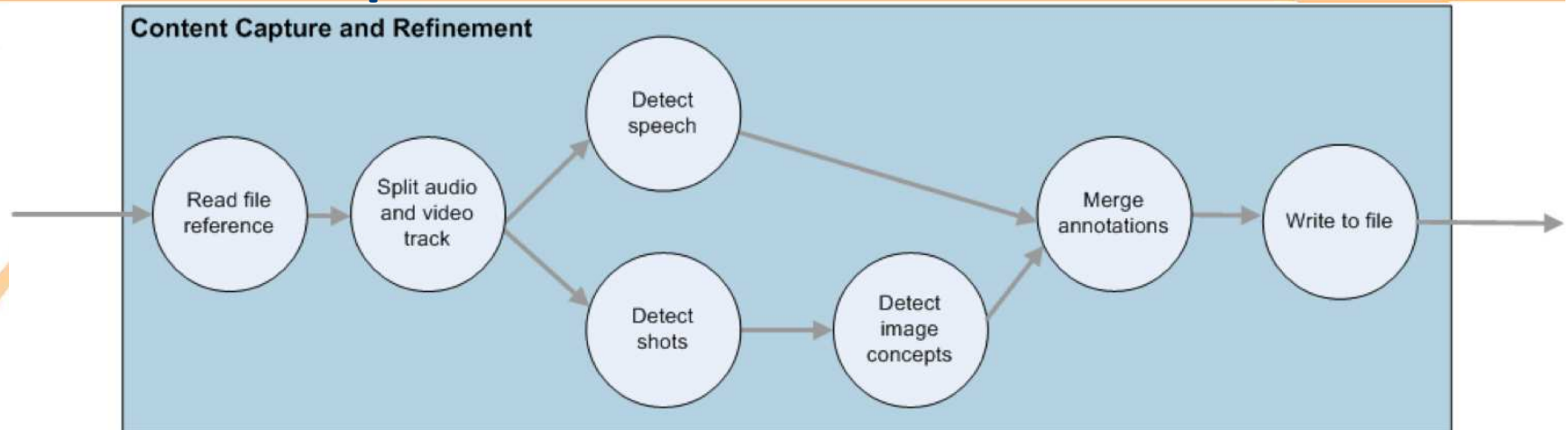
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# Example application: Video search

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# Content Capture and Refinement in PHAROS in previous example



In this example the content of a video is analysed:

- first of all is split into its audio and video track.

- Audio track is segmented, speech to text is performed and results is analysed.

- Video track is segmented by shots, each image in shots is analysed and associated to concepts.

- Information resulting from this analysis is merged into a unique annotation file associated to the video.

Indexing will take into consideration "rich media annotation" and will provide elements for subsequent search and the queries

# PHAROS uses a federation paradigm

- PHAROS uses a federation paradigm from which a System Integrator can select search functionality needed for business intelligence applications

- This concept is intrinsic in PHAROS service architecture with web service and defined API  interfaces . Adding a functionality that it is not yet present is easy (for example new annotators can be easily developed for specific needs)

- We did this exercise successfully by embedding a Face recognition service from 3rd party. The 3rd party actually did in a couple of weeks with the support of our PHAROS technical team

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# PHAROS is a LEGO system: examples

Adding powerful personalization, to a B2C portal for community monitoring, and social analytics tools. Here the requirement is to integrate the functionality of the **User & Social Information Storage** component in PHAROS in the host application, as the user data are the most valuable and hard to delegate content

Making more robust and existing Multimedia content management and publishing application, by reusing the reputation concept supported by the **Spam, Reputation & Trust** component in PHAROS. Typical service model could be to integrate it into the host application and let it work on the local log of user's activity and of uploaded content

Re-branding an existing search functionality with PHAROS, by superimposing a own interface (e.g., as required by embedding Multimedia search into an existing portal). This service could be delegated to **Search Engines components** in PHAROS or integrated in a host application

Wishing to reuse the gateway software to various types of data sources. Using the **Connectors components** PHAROS could support that either by integrating the service into the host application or by using the Connectors hosted by PHAROS.

Aggregating content from different providers while delegating the content registration and analysis process to PHAROS,: that will be possible by using the service provided by the **Content Registration & Rights** component in PHAROS

Having content annotated by PHAROS for a better search performed by existing search engine service: by using annotators from the **Multimedia Annotation Library** and a personalised **Content Capture and Refinement** component in PHAROS

And more

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# PHAROS: a SOA Multimedia search platform

- Built around a collection of reusable components with well-defined interfaces.

- Offering  a tool kit to build search-driven applications and services
  - easy to build, customizable, adaptable to your specific needs;
  - extensible with plug-in (e.g. third-party) capabilities;
  - flexible and open to evolve and to be extended as application requirements change over time;
  - replicable to new application scenarios without having to rebuild a solution from scratch

- It is unique!

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# PHAROS: a SOA Multimedia search platform (simplified)

42 components / 110 web services implemented, tested, integrated, deployed

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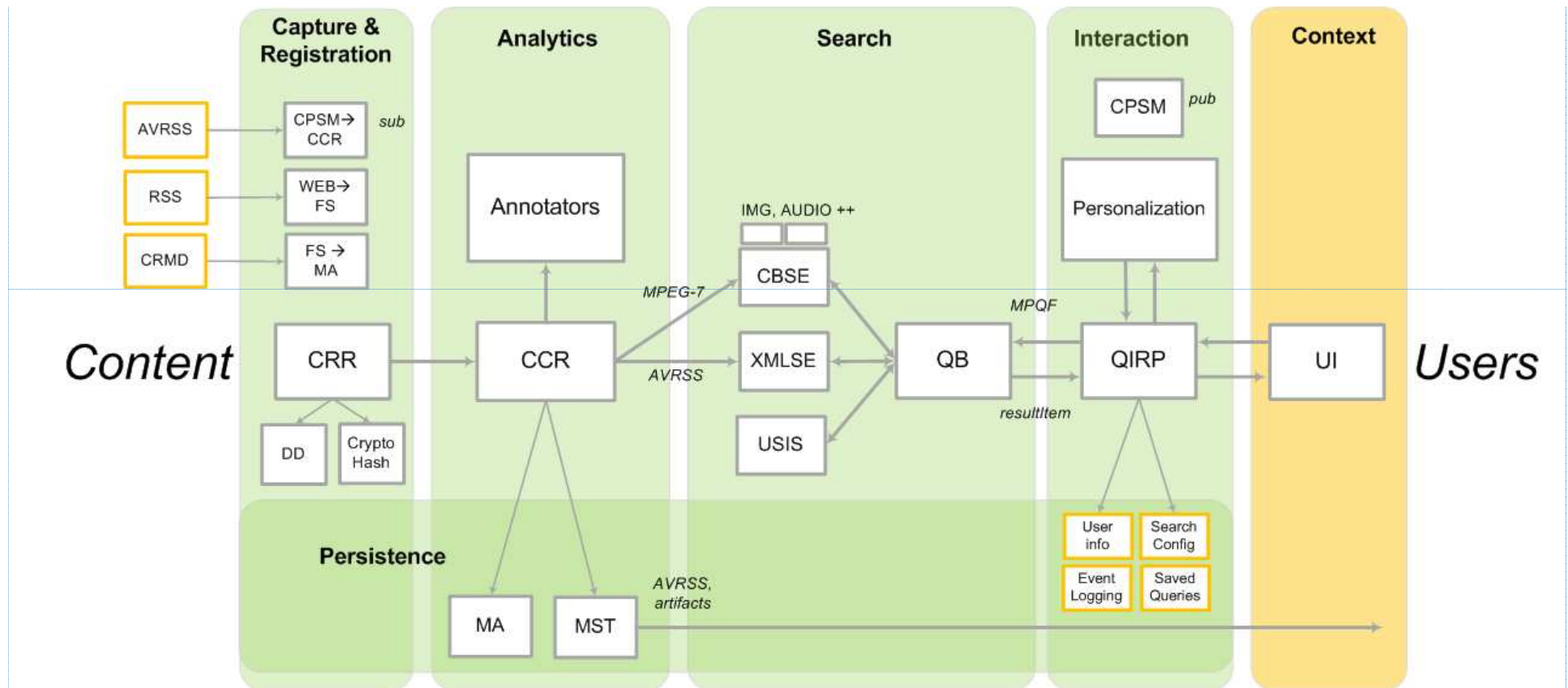
# What is the PHAROS Federation Programme

- a vehicle for "early adoption" that means

  – Starting to work with the Consortium members

  – Access to in-depth information about the project, not otherwise accessible

  – Participation to the Federation Day

  – Participation to Technology Transfer activities



Como, Italy, June 22-26, 2009

PHAROS SUMMER SCHOOL 2009
5 days of research and industrial perspectives on audiovisual search

open to students and to PHAROS FEDERATION MEMBERS

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# Soon you can directly experiment PHAROS

- The validation phase of PHAROS is now starting: it foresees its testing against requirements of use cases

- It will be complemented by feedback from experimental users of selected configurations open to external access

- Members of the PHAROS FEDERATION can access those configurations

- Those experimentations are essential to organisations willing to pilot PHAROS potential, preparing long term

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# Advantages of joining the PHAROS Federation

- PHAROS Federation members will have

1. the right to access the PHAROS Demonstrator and see how it works, evaluate and so on.

2. the chance to enact discussions about requirements with the project.

3. the right to propose to PHAROS some content to be annotated. The project will evaluate depending on available time and resources.

4. visibility of interfaces to PHAROS services on which to develop a PHAROS-based application.

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# The PHAROS FEDERATION Day

- During the PHAROS Summer school, a one-day event will be organised dedicated only to the Federation members.

- This initiative has the objective of transferring the PHAROS technology to potential early adopters. A number of scenarios presenting the possible usage of PHAROS will be presented in order to allow potential adopters to become familiar with the PHAROS services and benefits.

- This event will present in fact 4 scenarios that can be applied to the Federation members' real environments.

- The morning will focus on the PHAROS scenarios and demonstration, while in the afternoon Federation members will have the opportunity to present themselves, their needs and what are they expecting from PHAROS.

http://www.pharos-audiovisual-search.eu/res/files/SummerSchool/Pharos_Summer_School_announcement_Federation1.pdf

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# The PHAROS Summer School

The Summer School will engage students, researchers, and practitioners in the most challenging topics of next-generation search technology, explained by top international experts in the field from both academia and industry.

The addressed research areas and business scenarios include: information retrieval, indexing and relevance computation, knowledge extraction from audiovisual data, query processing on audiovisual data, content-based search, social search, industrial and business scenarios for audiovisual search.

The Summer School will feature a training program of five full days dedicated to the hottest topics in audiovisual search, allowing the attendees to get in touch with the principles and practices of information access in rich media.

Participants will also experience a close-by view of the PHAROS platform and its technological components and learn how to develop advanced audiovisual search applications in practice. A set of laboratory and hands-on sessions will guide the participants through the main technical aspects of a multimedia search platform.

http://www.pharos-audiovisual-search.eu/res/files/SummerSchool/Pharos_Summer_School_announcement_Federation1.pdf

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# How to join

- Usual procedure is through the PHAROS website:

http://www.pharos-audiovisual-search.eu/pharos-federation/expressing.html

- Reference module is in your leaflet

- Come and discuss directly here at the Convention with Alessandro and I

- Requests for membership will be submitted to the Project Board and the notification will be delivered to the requester within fifteen days.

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# Light involvement in PHAROS

- **PHAROS @ LinkedIN**: a community of interest where discussing and sharing opinions about Multimedia Search

  - 269 members to date

  - Not a lot of activity so far, but increasingly going to be used to promote PHAROS

- **PHAROS newsgroup** created to include all the contacts that do not want to join the LinkedIn group or do not have a LinkedIn account.

  - About 100 contacts to date

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# Conclusion

- A new paradigm for the future: **open search**

- Search in the Future Internet of Services

- Some keywords for the future: lessons learnt:

  – Open source Search is possible

  – Open Innovation vs. close one

  – Business Ecosystems vs Value Chain

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# Search in the Future Internet

- **Internet of services** –the concept of service management *"in a world which is open, dynamic, without centralised governance, and behaves in an unpredictable manner. This includes all the aspects of lifecycle management: operational management, service design, service development and deployment, and service delivery assurance"*

- *Search as a services*

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# Search in Future Internet

- *Already in the current Internet we are using some core services – such as search engines. Others, e.g., to provide geo-information, people search or social networking, have seen tremendous growth in recent years. Mostly we are using these services in isolation from each other, e.g., via independent websites and user interfaces. Some services – like search – are starting to become integrated but here a significant increase can be expected.*

- **Future Internet Cross-ETP Vision Document**

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# Business Ecosystem

- The idea of Business Ecosystem in the search context means to move forward from the simple value chain model to a more innovative Business Ecosystem approach for the multimedia search domain.

- Business Ecosystem is a sustainable community of enterprises and institutions, sometimes collaborating and sometimes competing, but in both cases creating value for end-users, their customers, themselves and each other.

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# Open Innovation

- *"Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology."*

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Thanks for your attention !!!

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