

MEDIA RECOGNITION FOR CONTENT CREATORS – A NEW DIMENSION IN MEDIA ASSET MANAGEMENT

Over the past ten years, we have become accustomed to finding content through text based queries. However, a vast share of content, especially in the media industry, is not in text form but rather in image, audio or video format. Therefore, mechanisms to automatically recognize media are long overdue. In this white paper Cluster Reply introduces media fingerprinting as a gateway technology to semantic asset management in your company.

A BRIGHT FUTURE FOR MEDIA RECOGNITION

According to Gartner technology research, the media industry spends 15% of its IT budget on the management of their digital assets. Recent surveys show that, here, process automation is a clear and necessary trend. Noting the fact that Digital Asset Management, Workflow Optimization and Business Intelligence are the industry's top spending priorities, the necessary software tools to fulfill these requirements are in great demand. Content based media handling can offer simplified process transitions and new sources of revenue. Being able to reference media files by their content is a prerequisite for Rich-Media search operations and the next step in advanced search technology. Norwegian's Public Radio (NRK) Music Library team, is looking forward to using Media Recognition within the Media Asset Management System. Journalists are required to protocol the musical content of their broadcasts. However, due to errors occurring in the reporting process, the copyright collectives demand very high penalties per year. For NRK like many other broadcasters and media companies, establishing a robust automated reporting system via Media Recognition is an imperative. The system will be able to recognize copyrighted music without the need of human supervision. The savings on penalties will more than enough to cover the investment and offer a strong position for royalty negotiations. Once in place, it will be extended to a full feedback loop to support our business intelligence with data ranging from simple play counts to mood statistics.

TECHNOLOGICAL ADVANCES OPEN NEW DOORS

Unlike text-based search engines, multimedia information retrieval requires specialized search methods due to the non-explicit availability of relevant information. Recent scientific advances have opened up these 'semantic' technologies for business use.



By use of a media fingerprint, one can reliably recognize a file not only by its size or play duration, but also by internal characteristics like beats-per-minute, vocal artist, predominant frequencies, or dominant colors (in video), going as far as mood or genre recognition.

Although these technologies are the next but one in line, the first step is delivered by tools based on media fingerprinting. By extracting a unique and meaningful fingerprint from all available media files, a reference database can be established.

Using this database, immediate recognition of a media file is possible. No matter the format, the file name, the encoding or quality, content can be recognized and linked by the system, without the need of human interaction. This enables fast transformation of numerous traditional processes as well as the creation of new content based applications.

FINGERPRINTING – FROM PATTERN RECOGNITION TO A SMARTER DATABASE

Using the example of audio, let us take a look at a fingerprint reporting system. The scenario works correspondingly for still images and video content. Several considerations are necessary for an efficient and comprehensive matching scheme:

- Low computational complexity of the fingerprint extraction process
- Compactness of the fingerprint
- Robustness to alterations of the original recording
- High speed of the identification process

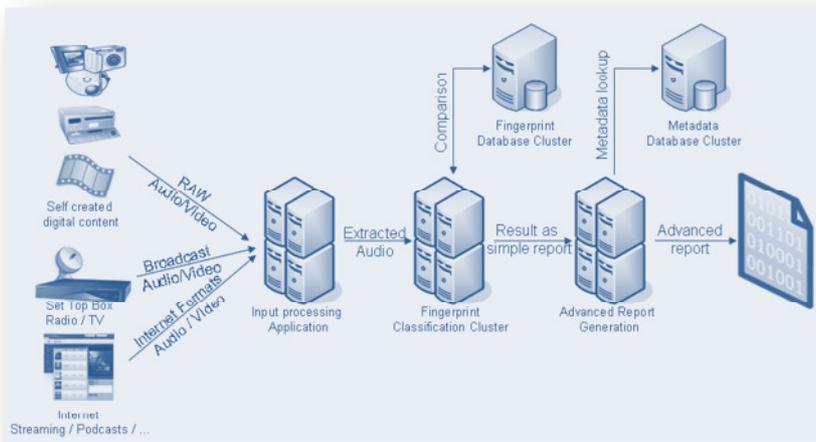
Accordingly, the extraction process is trimmed to perform in a timely manner, while creating fingerprint files of manageable size that are unique towards a matching with millions. The process is such that

- A unique fingerprint is extracted from each audio file that is present.
- These fingerprints are combined to build a reference database.
- Any unknown content can be compared to this reference database, and identified via matching with the relevant fingerprint.

BUSINESS CASES

Cluster Reply is seeing a strong value gain for the implementation of a Media Recognition system, for example in the following scenarios:

- Broadcasters, studios and advertising departments are by law imposed to deliver detailed music reports to national copyright collectives. Reporting the composition of a broadcast product is a lengthy task.



The human factor often leads to error and inaccuracies in the report, causing extra processing time and possible penalties. A Media Recognition system assists to create accurate and detailed reports, eliminate human error, speed up the feedback cycle, lower royalty rates as well as eliminate penalties. The reporting system tells which part of an audio track was played when for how long, combined with any additional piece of information available in the system. Broadcasters either use

their own digital media archive as reference or link into external systems which act as service providers.

- Clips, documentaries, advertising films, virtually all video assets consist of dozens and hundreds of cuts. Traditionally, the information about the sources of these components is lost in the final product. A television broadcaster is unable to track where and how often a particular film clip has been reused. A movie producer cannot explicitly see which parts of the source material have been used in the final film. Media Recognition delivers this data and directly links the components in the database. Video recognition can be combined with audio recognition for the estimation of music royalties, thus forming a system of hitherto unknown access power and data. Proactive online search of referenced material for viral marketing business intelligence and tracking of pirated material are an extension of this feature. Learn where, when, how and how often your content was played.

SUMMARY

Purely text-based searches are outdated. Soon, it will not be sufficient to solely recognize media by its meta-tags. Being able to automatically access content with comprehension of its meaning will be the measure and distinction of future processes. Such content handling is called Rich Media or Semantic Search. Media fingerprinting as a technology offers the means to:

- Uniquely, reliably and quickly identify media.
- Recognize images, music or videos only by their inherent characteristics, independent of size, encoding, disturbance or metadata.
- Extract important features from files which enable semantic searches.

Fingerprinting is the answer to semantic searching as it can be easily integrated on top of existing systems and does not alter or interfere with the original media file, i.e. it is "read-only".



Cluster Reply is a highly dynamic and innovative company specialized on Microsoft technologies and applications. Cluster Reply is a Microsoft Gold Certified Partner and has helped its customers to take advantage of Microsoft cutting edge technology since 1996. Cluster Reply is leading on Microsoft Business Intelligence, Sharepoint, CRM, collaboration, portals, cloud computing (Windows Azure), application development, mobile solutions and data services by integrating the most effective online tools and services into enterprise-scale platforms. The inclusion in the network of the European IT service provider Reply opens up access to the knowledge of over 3,000 IT experts. In 2010, the Reply network of companies had a turnover of approx. 384 million euros in the main offices in Italy, Germany and the United Kingdom. For further information visit www.reply.de