Usage Scenarios

Deliverable D6.1

TOSCA-MP identifier:	TOSCAMP-D6.1-RAI-UsageScenarios-v02_final.doc
Deliverable number:	D6.1
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Internal reviewers:	Birgit Schmidt-Sodingen (IRT), Diego Giuliani (FBK)
Work package / task:	WP6/Task 6.1 - Scenarios and requirements
Document status:	Final
Confidentiality:	Public

Version	Date	Reason of change
1	2011-12-12	First complete version
2	2011-12-12	Version for internal review
3	2011-21-22	Final version

Acknowledgement: The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 287532.

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Executive Summary

This document collects usage scenarios elaborated by the TOSCA-MP partners which the overall system is supposed to address, at different levels of completeness, during the development of the project. The consortium chose to inspire to S-Cube methodology [Di Nitto, 2010] to identify a two-level hierarchical description of such scenarios. This methodology distinguishes between high-level goals (named *business goals*), i.e. target conditions which are to be met by the system from a mainly business process-orientated perspective, and more detailed scenarios, which are more practical settings in which actors and systems interact to achieve a specific result.

During the analysis phase, the consortium decided to classify the business goals and scenarios which were analysed into three main classes: demonstrable goals and scenarios, optional goals and scenarios, and not addressed goals scenarios. The first category includes scenarios which will be actually demonstrated by the project through its lifetime, following the plans defined in the Description of Work. The second category (optional) includes scenarios that will be optionally part of the demonstrations, in case sufficient resources will be available during the project lifetime. Finally, not addressed scenarios can be used to derive functional and non-functional requirements for the system, but they will not be subject of consideration for demonstration.

Overall, the consortium identified 10 different business goals and a total number of 15 scenarios, i.e. one or more scenarios for each identified business goal. Each business goal comes with a textual description which illustrates the rationale underlying the goal and its main objectives. Scenarios complement the description with UML use case diagrams, which go a step further in the formal description of the system requirements by providing insights about which functionalities will be part of the system and which actors will be involved in the practical test cases.

Further details about each scenario will be identified in a second cycle of analysis, namely the one which will produce the requirements for the platform (month 8 of the project), for which this document will act as primary input.

Business goals and scenarios span over a considerable range of real media production processes, and overall capture an important portion of the media production value chain, which could actually benefit from the employment of TOSCA-MP products.

From the analysis of the identified usage scenarios it can be concluded that the planned advancements are relevant and well in line with users expectations.

For these reasons, as an overall conclusion for this piece of the work, the consortium considers sufficiently adequate the number, nature and quality of the identified scenarios for the subsequent phases of the project, most importantly the requirement analysis.

1 Introduction

1.1 Purpose of this Document

Description of the usage scenarios of the overall system.

1.2 Scope of this Document

This deliverable covers the description of usage scenarios of the system that the TOSCA-MP consortium will develop and demonstrate during the project's lifetime. It also covers a set of optionally demonstrable scenarios as well as a set of scenarios used only for requirements analysis. It includes analytical considerations about relevance and coverage of planned research advancements w.r.t. identified scenarios.

1.3 Status of this Document

Final

1.4 Related Documents

TOSCA-MP Annex I – part B Description of Work (see document stored on BSCW: https://iis-bscw.joanneum.at/bscw/bscw.cgi/d271254/DOW%20TOSCA-MP%20(287532)%202011-07-22.pdf).

2 Approach and Methodology

2.1 Approach

Defining usage scenarios for complex software systems follows in general a cyclic pattern, in which high-level requirements are gradually matched with system's functionalities based on testing, verification and user feedback.

The TOSCA-MP consortium had already provided two sample scenarios during the proposal phase, which were included in the Annex I of the Proposal (part B - Description of Work). Those scenarios were intended as illustrative examples of the end-to-end capabilities that the foreseen system would have delivered, together with the main technical advances from the architectural point of view. As such, they included both usage and architectural aspects at the same time, and in a static view.

The following Figure 1 and Figure 2 report the original drawings for illustrative purposes only.

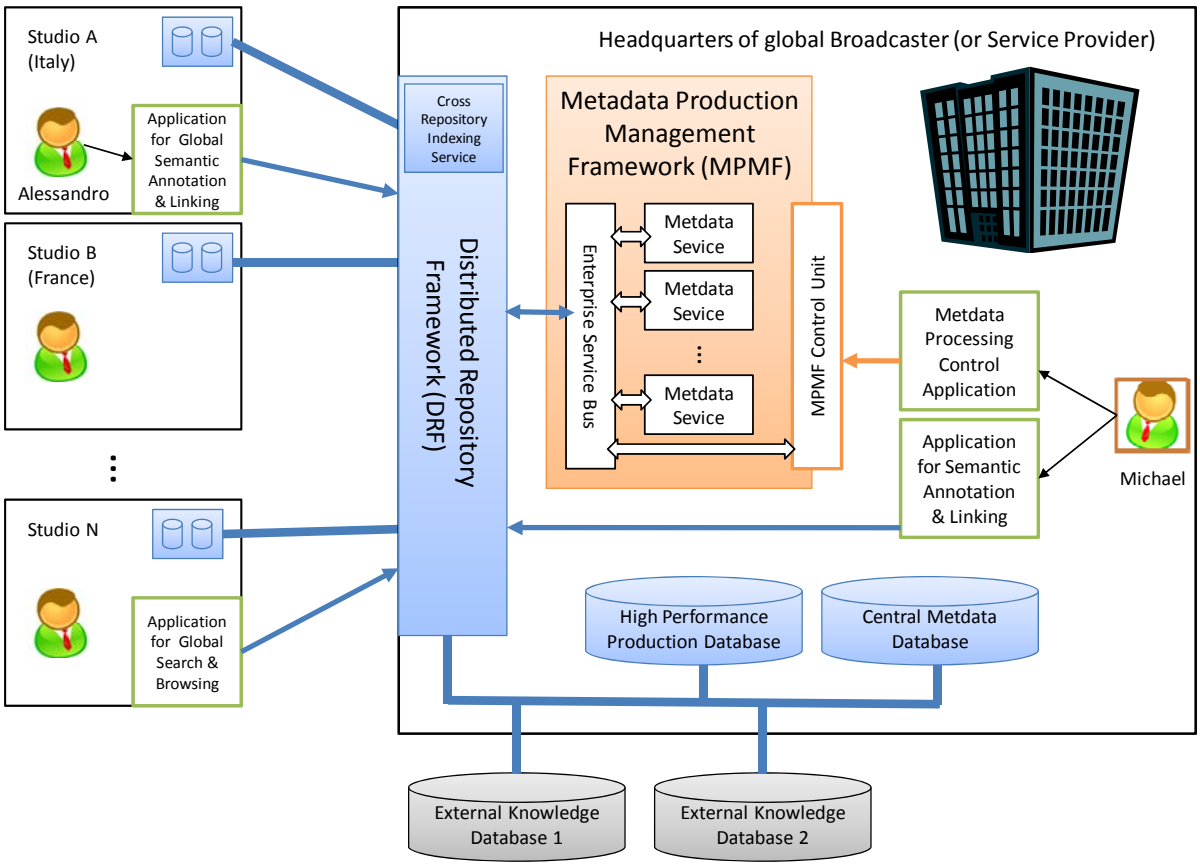

Figure 1. Scenario 1 - Distributed service-based content annotation with relevance feedback

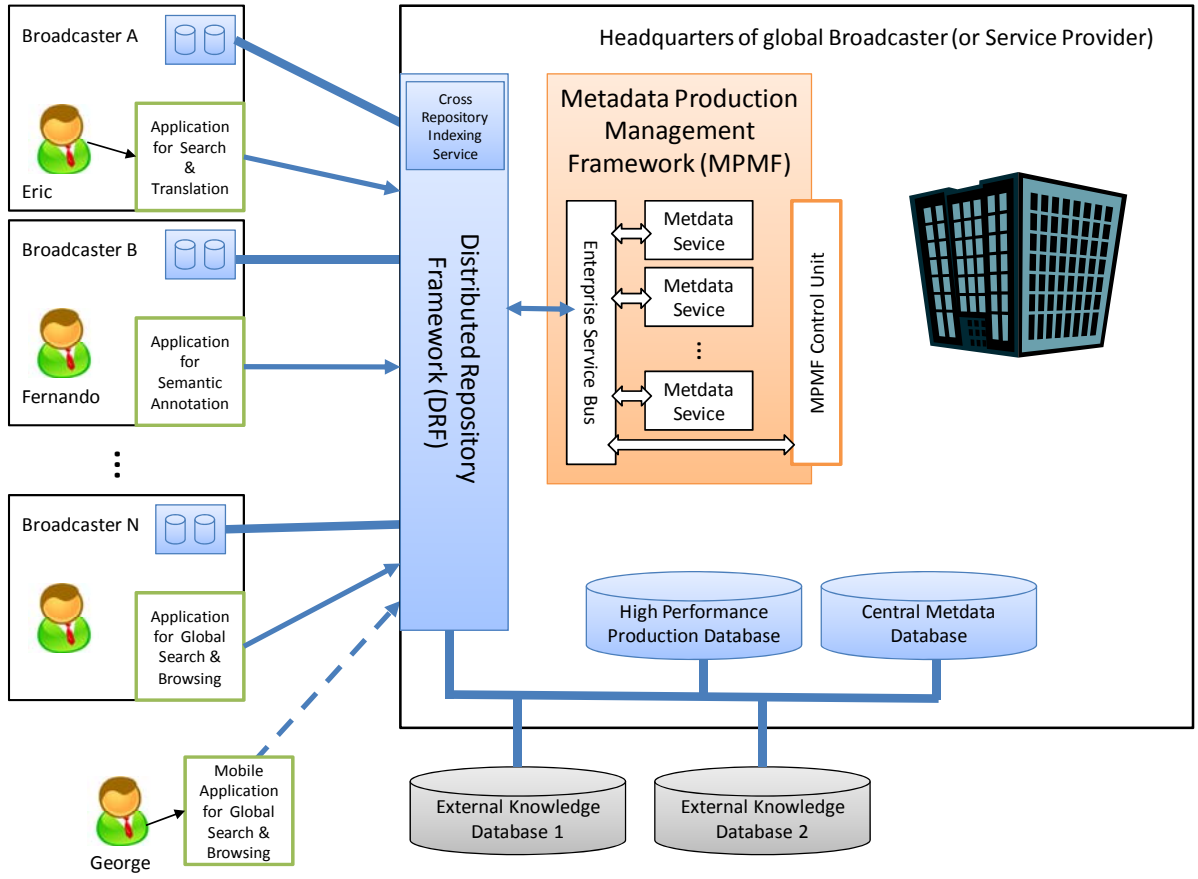

Figure 2. Scenario 2 - Distributed semantic search and retrieval of multilingual content.

However, while the original approach proved useful to illustrate in a compact and compelling way the concept behind the project, as well as some of the novel ideas to be developed, it did not fully represent a good practice for the system actual development, which should instead follow as much as possible an analytical domain-driven approach rather than a technology-driven one.

Therefore, in order to ensure that the TOSCA-MP system meets a wider set of possible usages than the original ones, the approach used to develop this part of the work, fully reflected in this document, was to enlarge the perspective from the original proposals, at the same time embracing them in a more extended usage context.

The consortium elected high level goals and usage scenarios as guiding elements for the analysis, inspired by emerging philosophies in software development life cycle, which recommend the use of top-down and scenario-based approaches for complex software systems [Koehler, 2006][Liu, 2008][Rosson, 2009][Kaindl, 2011].

As a consequence of these decisions, the architectural artefacts included in the original drawings (namely the Metadata Production Management Framework and the Distributed Framework Repository) have been temporarily omitted from the usage scenarios UML diagrams of this document. In all scenarios the only pictorial reference to the system to be developed will be marked as “TOSCA System Boundary” (see example in Figure 3, taken from Section 3.2.1). Inside this boundary, actors and use cases identified as pertinent to the TOSCA-MP system will be included.

Architectural artefacts which will implement the use cases and interactions with actors will be refined in a second stage, and will result in other parts of the work, namely the “Overall architecture, interfaces and protocols of the Distributed Repository Framework” (D5.1) and “Requirements” (D6.2) deliverables, due respectively at M12 and M8 of the project.

These deliverables will be heavily based on the analysis conducted in the present document, and will likely refine and improve the original architectural setting based on the more extended and detailed usage scenario analysis included in it.

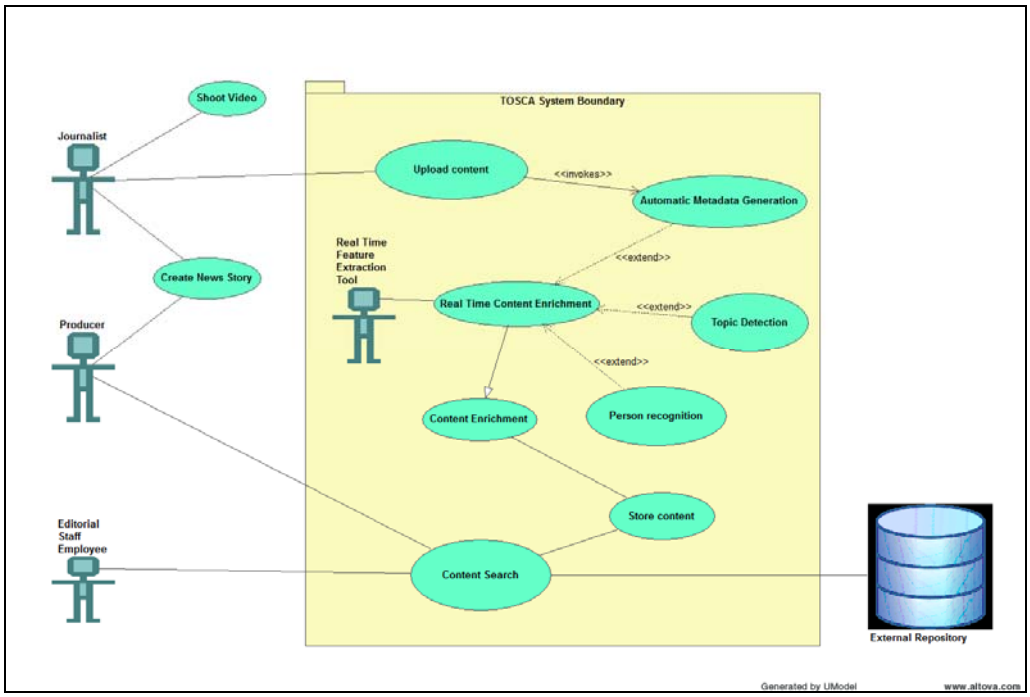

Figure 3. Example of scenario description in UML. The "TOSCA System Boundary" includes use cases and actors to be implemented as part of the overall architecture.

2.2 Methodology

Several approaches are available in software engineering literature for solving the problem of scenario-driven design.

Among these, TOSCA-MP chose a methodology inspired by the S-Cube methodology [Di Nitto, 2010], which is based on [Jackson, 1995]. This method distinguishes between high-level goals (named *business goals*), i.e. target conditions which are to be met by the system from a mainly business process-orientated perspective, and more detailed scenarios, which are more practical settings in which actors and systems interact to achieve a specific result.

Both business goals and usage scenarios come with textual descriptions and few additional features, usage scenarios are always accompanied by an UML use case diagram. Table 1 and Table 2 report the respective template tables for these descriptions, as specified by S-Cube.

Starting from the two condensed scenarios presented in the Description of Work, the consortium at first extended the analysis trying to capture additional usage environments, then focussed on the most important ones, for which also a ranking of importance has been assigned. The resulting ranking is readable from the “Priority of accomplishment” field in the descriptive tables, where “must have” is assigned to demonstrable scenarios, “should have” to optional ones, and “could have” to not addressed ones.

Field	**Description**
Unique ID	*Give a unique ID for this goal/assumption*
Short name	*Give a short name for this goal/assumption*
Type	*One of the following:* • *Business goal* • *Domain Assumption*
Description	*Specify the intention of the goal/assumption*
Rationale	*Give a justification of the goal/assumption*
Involved Stakeholder	*Stakeholders involved in the business goal/assumption*
Supporting materials	*Give a pointer to documents that illustrates and explain this goal/assumption (in particular those of domain analysis*
Priority of accomplishment	*One of the following:* • *Must have: The system must implement this goal/assumption to be accepted.* • *Should have: The system should implement this goal/assumption: some deviation from the goal/assumption as stated may be acceptable.* • *Could have: The system should implement this goal/assumption, but may be accepted without it.*
Tentative scheduling	*Tentative scheduling of accomplishment. To be used only if the case study has to be implemented.*

Table 1. Business Goal template table.

Field	**Description**
Unique ID	*Give a unique ID for this scenario*
Short name	*Give a short name for this scenario*
Related to	*Specify the goal/assumption ID to which the scenario is related*
Involved actors	*Specify the actors involved in the current scenario*
Detailed operational description	*Give a textual description of the scenario*
Problems and challenges	*Describe the specific problems that each scenario addresses or that consumers and providers face*
Additional materials	*UML diagrams supporting the understanding of the scenario*

Table 2. Scenario template table.

3 Results of the Analysis

3.1 Introduction

This Section reports all identified business goals and scenarios.

3.2 Business goals and Scenarios

3.2.1 Fast retrieval of very recent material (BG1.1)

Field	**Description**
Unique ID	TOSCAMP-BG1.1
Short name	Fast retrieval of very recent material
Type	Business goal
Description	This business goal states that very recent material should be immediately retrievable. To accomplish this immediate disclosure of newly ingested material, making it available for search immediately, is necessary.
Rationale	In an efficient actual-driven production environment such as news production, the speed of the workflows is very important to bring footage to the screen as fast as possible. Therefore, to allow efficient retrieval, media material should be disclosed in real-time, or as near to real-time as possible. When this real-time generated metadata proves to be inadequate, manual intervention should be possible.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Must have

3.2.1.1 Related Scenarios

Fast content disclosure for news production

Field	**Description**
Unique ID	TOSCAMP-BG1.1_S1
Short name	Fast content disclosure for news production
Related to	3.2.1 Fast retrieval of very recent material

Involved actors	News and actual Producer, Journalist, Editorial staff employee
Detailed operational description	When an important event happens, journalists and cameramen are sent on location to capture the event and to produce the story. During the production of their story, they ingest the raw material into the broadcaster's content management system. From that point onwards, the material should be retrievable for editing or direct usage in broadcast news shows and on internet portals: several producers of other actual programs want to find the right content of the day for use in their programs. To accomplish this, metadata is generated and stored in real-time, based on the story title, recording location of the content, time of recording, and a fast scan of the content with automatic feature extraction tools, the right topic is automatically attached to the material. If possible, persons appearing are recognized. This fast generation of metadata allows for a fast retrieval of the material by everyone who needs it for use in his program.
Problems and challenges	• (semi)-Automatic topic detection • real-time person recognition • technical issues with real-time performance of indexing processes • integration issues with generation devices (data formats and standards)
Additional materials	UML diagram see Figure 4

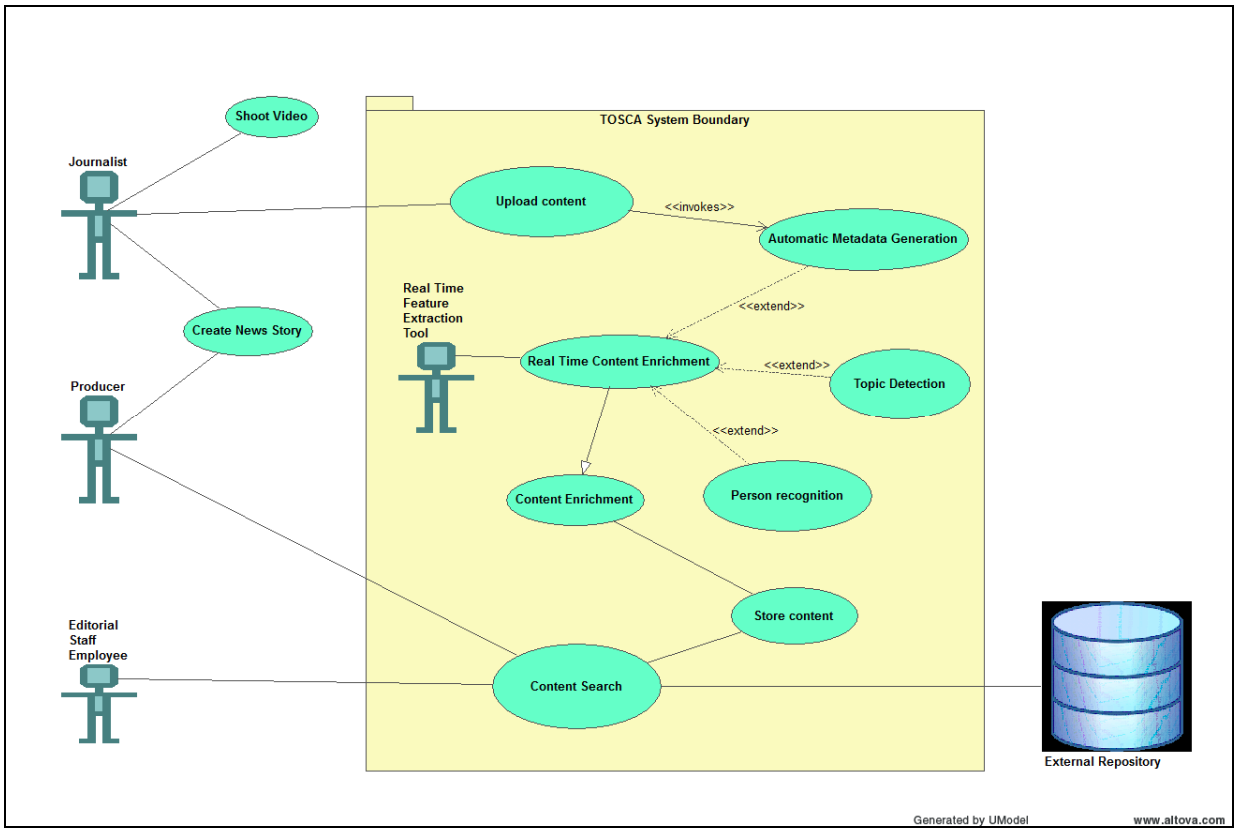

Figure 4. TOSCAMP-BG1.1_S1

3.2.2 Efficient retrieval of historical archive material (BG1.2)

Field	**Description**
Unique ID	TOSCAMP-BG1.2
Short name	Efficient retrieval of historical archive material
Type	Business goal
Description	This business goal states that archive material should be efficiently retrievable, and that very specific questions could be asked to the retrieval system (e.g. a very specific quote of a politician, appearance of specific objects, time constraints …).
Rationale	In production of entertainment or documentaries, producers are always looking for very specific footage to include in their programmes. There are plenty of examples: visual illustrations for TV-quiz questions, overview of the career of a politician in a political program, search for bloopers or funny footage for an entertainment program etc…).
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*

Priority of accomplishment	Must have

3.2.2.1 Related Scenarios

Searching archived material, including deep archive

Field	**Description**
Unique ID	TOSCAMP-BG1.2_S1
Short name	Searching archived material, including deep archive
Related to	*3.2.2* Efficient retrieval of historical archive material
Involved actors	Producer, Researcher, Documentalist
Detailed operational description	For a particular entertainment show, each episode, a guest is invited. This guest is asked to list his favourite TV moments of the past. When the editorial department receives his list, they start to look through the archives for the requested media. Contents in archives may be both manually annotated by documentalists and automatically annotated by feature extraction tools. Using the same user interface they are also able to verify automatic metadata and search through multiple (including external) repositories on the look for interesting fragments. Also during the show, an overview of the life of the invited guest is presented. The task of the editorial department is also to illustrate this with relevant pieces of material found in the archive, which they also retrieve using the same system. In the end, the editorial department has collected all relevant audiovisual material in a shared basket and presents it to the producer. Together, they collaborate to create the script of the show.
Problems and challenges	• Detailed annotation of the audiovisual repositories, tagged with faces appearing, objects appearing, subject • Search through different repositories at the same time • Environment in which an entire editorial department can collaborate.
Additional materials	UML diagram see Figure 5

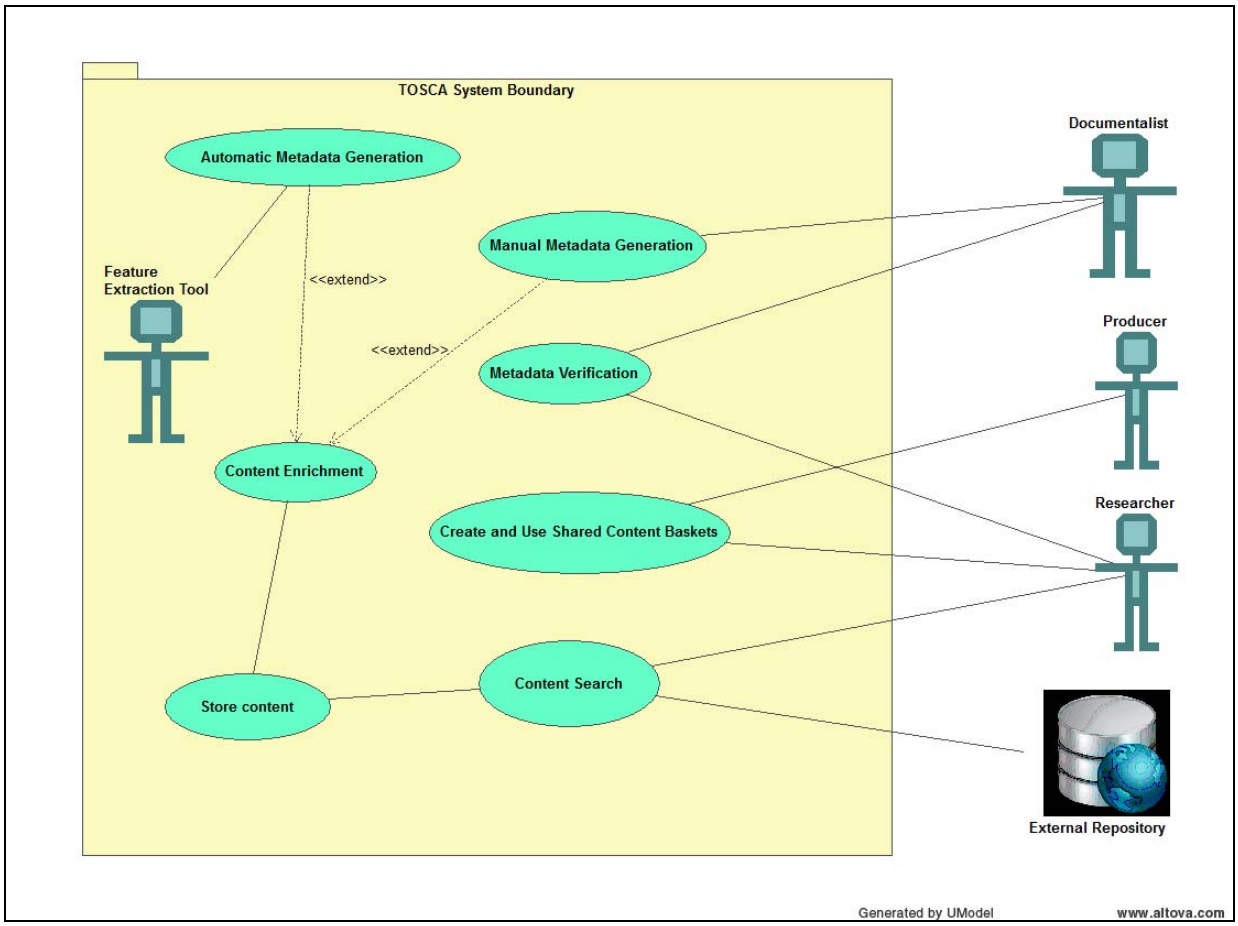

Figure 5 - TOSCAMP-BG1.2_S1

3.2.3 Access to International Feeds and their Use in News Production (BG2)

Field	**Description**
Unique ID	TOSCAMP-BG2
Short name	Access to International Feeds and their Use in News Production
Type	Business goal
Description	This business goal addresses the need to have seamless and efficient access to the content of international feeds (e.g., the Eurovision Network) through a rich metadata query interface, and subsequent utilisation of selected material in subsequent phases of news production.
Rationale	Improve access to distributed contents and make easier their reusability in subsequent phases of news production.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Must have

3.2.3.1 Related Scenarios

Distributed semantic search and retrieval of multilingual content

Field	**Description**
Unique ID	TOSCAMP-BG2_S1
Short name	Distributed semantic search and retrieval of multilingual content
Related to	*3.2.3* Access to International Feeds and their Use in News Production
Involved actors	Correspondents, Production Team, Documentalists, Journalists
Detailed operational description	A journalist, correspondent on the spot where a big event is scheduled, acquires some material about it and has to make the content accessible to his/her colleagues at broadcaster A. He uses an upload service available on his location to send all the acquired material to a central system in charge of analysing and extracting semantic metadata from the content and to publish the content online. Documentalists of broadcaster A may enrich the content through additional manual annotation. At the headquarters of another broadcaster B, the News Production Team is creating news stories for newscasts or news items to publish on the

	broadcaster's specialised web site about the same event. As such, they need access to news contents which were either recorded in the same location or at a different place and also in different languages than their native one. For instance, this data might have been recorded by a different broadcaster, in a different country. At broadcaster B, the news editorial staff accesses a search and retrieval interface which allow for semantic multilingual search and retrieval of material.
Problems and challenges	The problems and challenges related to this scenario are the following: • Multilingual query interfaces • Legal and technical issues with distributed and shared contents • Platforms' heterogeneity, lack of metadata interoperability at different levels (dictionary, structure, semantics) • Procedure for obtaining necessary information and data in case of service unavailability • Dependability, performance, security, and trust of data • Storing of working sessions • Integration of distributed workflows, distributed transactions, federated identities
Additional materials	UML diagram see Figure 6

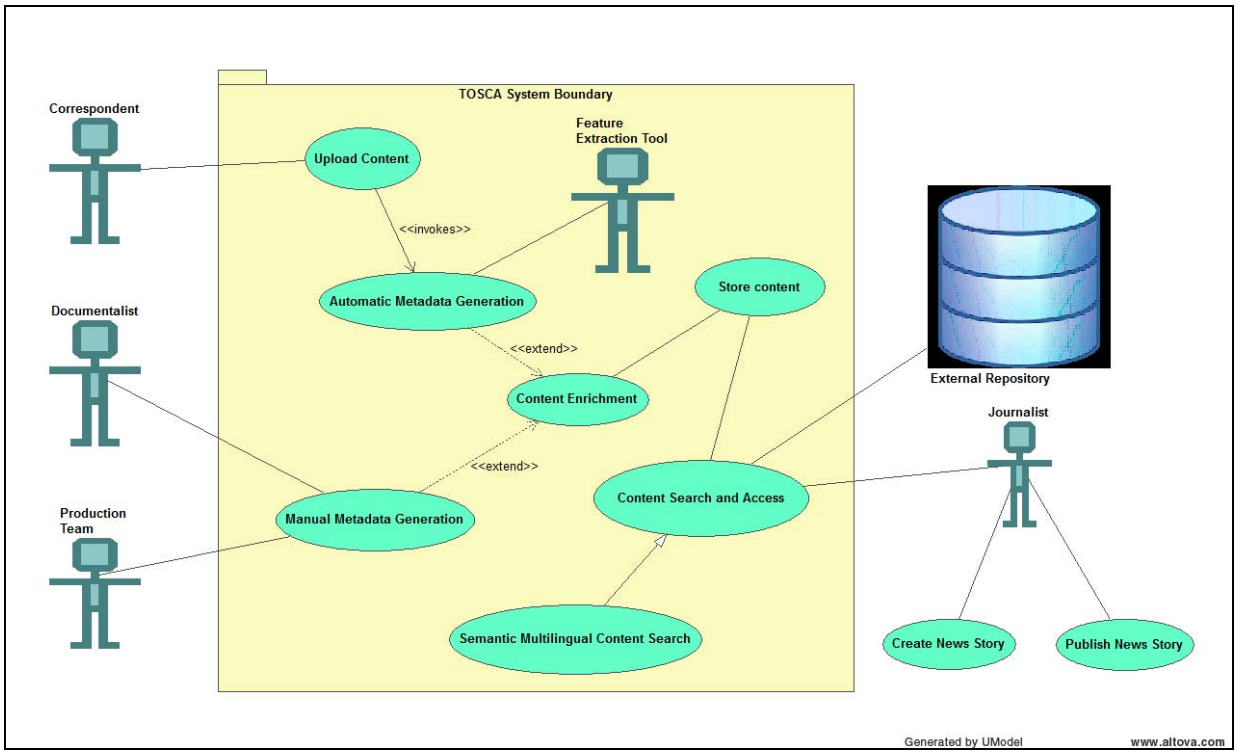

Figure 6. TOSCAMP-BG2_S1.

Dynamic configuration of features for content enrichment

Field	**Description**
Unique ID	TOSCAMP-BG2_S2
Short name	Dynamic configuration of features for content enrichment
Related to	*3.2.3* Access to International Feeds and their Use in News Production
Involved actors	Feeds Managers
Detailed operational description	Several contents belonging to international news feeds are ingested in distributed repositories and monitored by dedicated managers. While the content is getting available, the manager can select which enrichment workflow could be more suitable for each specific kind of material. For instance, due to particular characteristics of an A/V content, he can choose to ask to a central system, exposing many different services, for automated speech recognition and shot clustering, whereas for other kind of contents he can ask the same system to automatically integrate information from web resources or to use semantic web repositories (DBpedia, GeoNames, …) to enrich the content linking GPS coordinates to places on a map and city names. He can also use automatic genre characterisation services to automatically route the content to the most proper subsequent production processes.
Problems and challenges	The problems and challenges related to this scenario are the following: • Multilinguality • Content filtering process and interfaces • Content feature-oriented enrichment configuration interface • Automated analysis based on content format/genre • Legal and technical issues with distributed and shared contents • Platforms' heterogeneity, lack of metadata interoperability at different levels (dictionary, structure, semantics) • Procedure for obtaining necessary information and data in case of service unavailability • Dependability, performance, security, and trust of data • Storing of working sessions
Additional materials	UML diagram see Figure 7

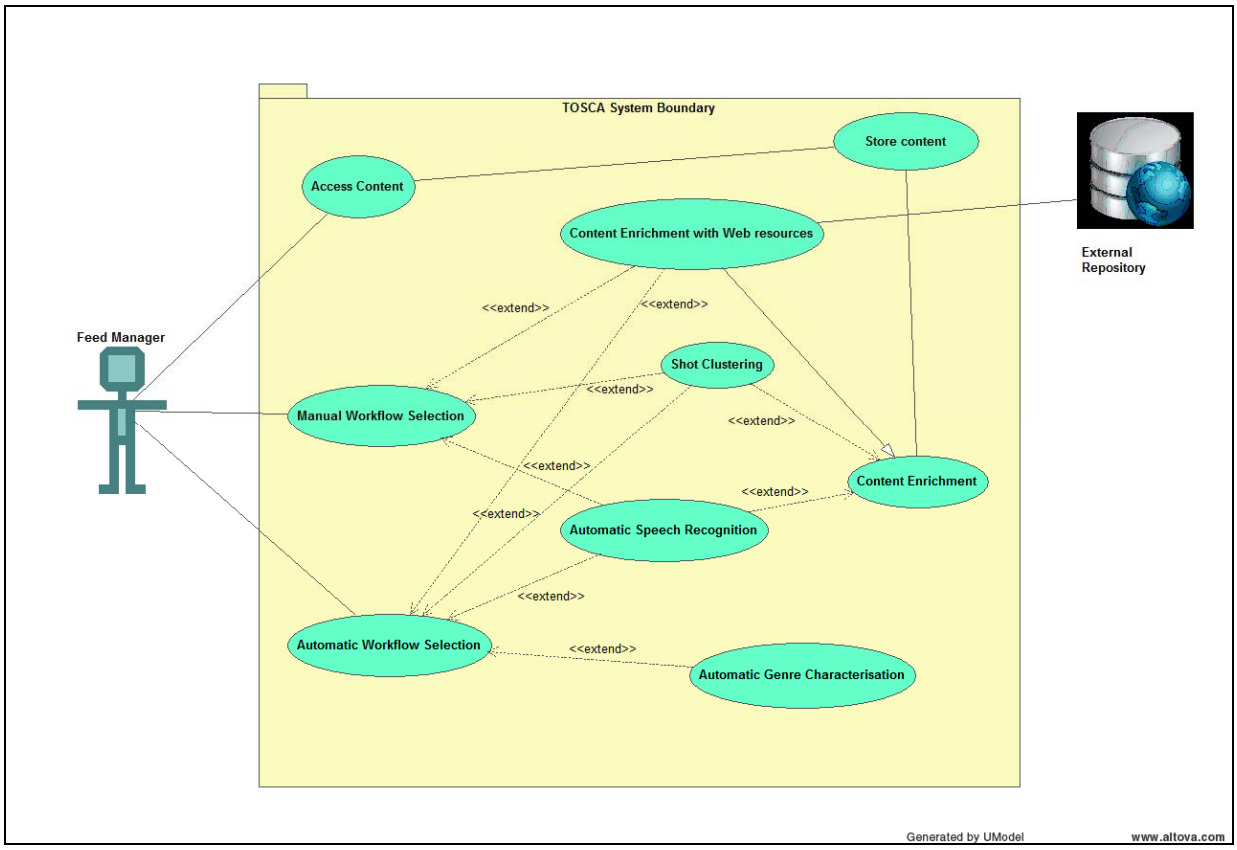

Figure 7. TOSCAMP-BG2_S2.

Machine-supported subtitle generation

Field	**Description**
Unique ID	TOSCAMP-BG2_S3
Short name	Machine-supported subtitle generation
Related to	*3.2.3* Access to International Feeds and their Use in News Production
Involved actors	Documentalist
Detailed operational description	A documentalist wants to subtitle some uploaded material in different languages. Therefore he first uses automatic speech recognition tools on the audio track of the material for having a good start and to save time instead of typing it all himself. Afterwards he is doing some refinements and corrections of inaccuracies and creates the subtitles in his own language. Then he uses the subtitle text for automatic translation. After the translation process he has subtitles also in other languages, which could be used for subsequent metadata extraction operations (e.g., entity recognition), or search.

Problems and challenges	The problems and challenges related to this scenario are the following: • Multilinguality • Accuracy of Speech-to-Text • Accuracy of Machine Translation • Creation of relation to timecode • Handling of files with timecode and text for translation • Legal and technical issues with distributed and shared contents • Platforms' heterogeneity, lack of metadata interoperability at different levels (dictionary, structure, semantics) • Procedure for obtaining necessary information and data in case of service unavailability • Dependability, performance, security, and trust of data • Storing of working sessions
Additional materials	UML diagram see Figure 8

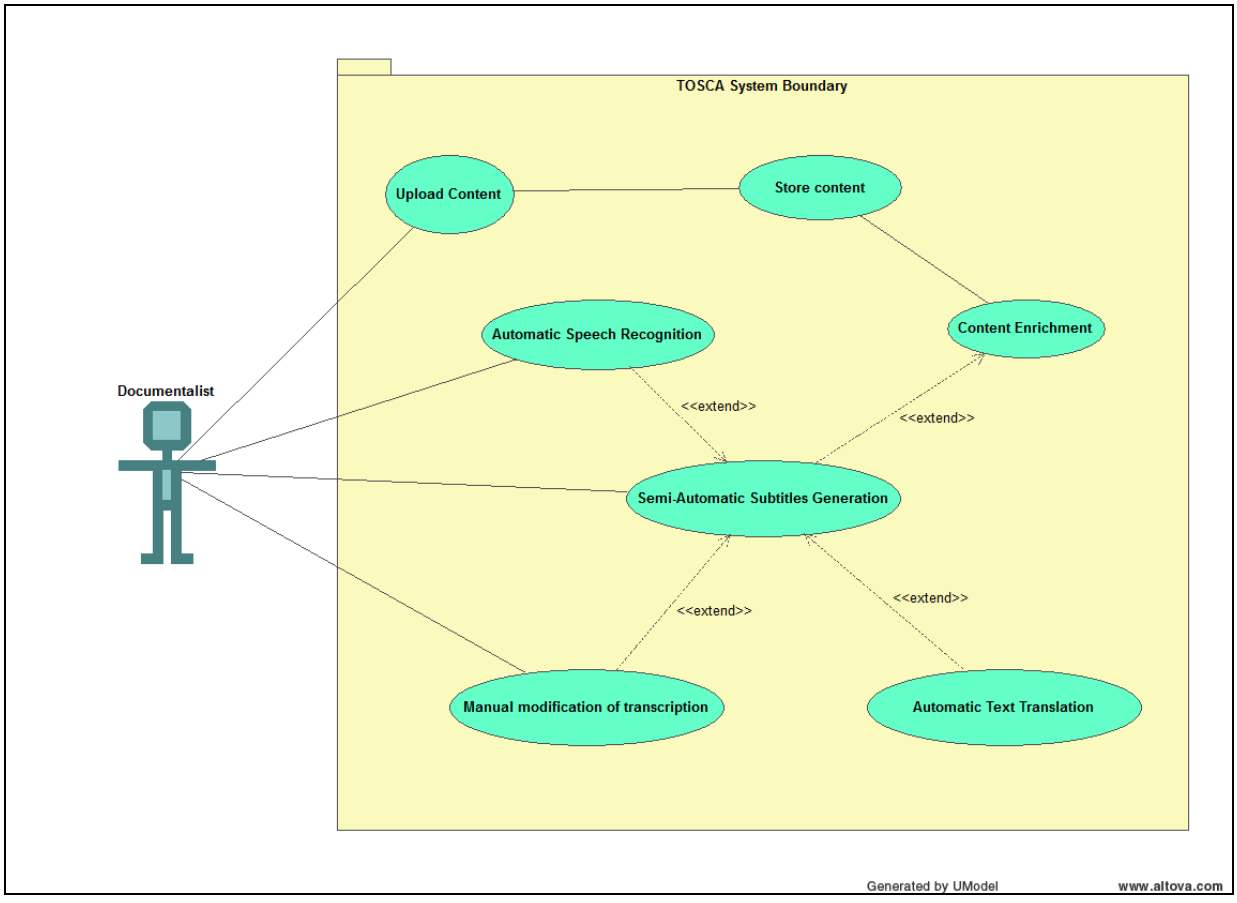

Figure 8. TOSCAMP-BG2_S3

3.2.4 News Daily Report with Event Detection and Impact Analysis (BG3)

Field	**Description**
Unique ID	TOSCAMP-BG3
Short name	News Daily Report with Event Detection and Impact Analysis
Type	Business goal
Description	This business goal addresses the need to have a daily report about current events (news) which integrates several sources of information (web, television, UGC), in more than one language. The objective is to provide news producers with a constantly updated report which should include thematic dossiers and possibly an impact analysis (audience scores, social networks citations/discussions).
Rationale	This business goal is useful to increase the efficiency of news production environments by improving access to several distributed sources of information overcoming linguistic barriers and by making possible to influence decisions about the production of news stories following social behaviour of users.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Should have

3.2.4.1 Related Scenarios

Assisted production of news stories using distributed multilingual sources

Field	**Description**
Unique ID	TOSCAMP-BG3_S1
Short name	Assisted production of news stories using distributed multilingual sources
Related to	*3.2.4* News Daily Report with Event Detection and Impact Analysis
Involved actors	News Producers, Social users, Production Team
Detailed operational description	At the headquarters of an Italian broadcaster A, a News Producer has to create a news story for the evening edition of newscast. He can choose the subject to talk about, so he would like to select the one which at the moment is considered the main thread on the net. The news producer asks to a central system to give him the threads ranked according to the number of published items on the

	web and on television and to the behaviour of users on different social networks. These items are uploaded in the system by a dedicated Production team. After having selected the subject, he asks the central system to get a constant update about the selected theme. The update comes in form of a multimedia report (or *dossier*) containing multilingual material properly aggregated/clustered coming from several distributed sources of information, both television and web. The Italian News Producer can enrich his news story taking suggestions in his own language coming from these heterogeneous materials. At the same time a News Producer of a Spanish broadcaster B can get suggestions about the same theme from the central system in his own language, exploiting the work already performed.
Problems and challenges	The problems and challenges related to this scenario are the following: • Dependability, performance, security, and trust of data • Ranking threads & Impact Analysis • Multilingual query interfaces • Thematic dossier creation • Legal and technical issues with distributed and shared contents • Platforms' heterogeneity, lack of metadata interoperability at different levels (dictionary, structure, semantics) • Privacy of users on Social Networks • Procedure for obtaining necessary information and data in case of service unavailability
Additional materials	UML diagram see Figure 9

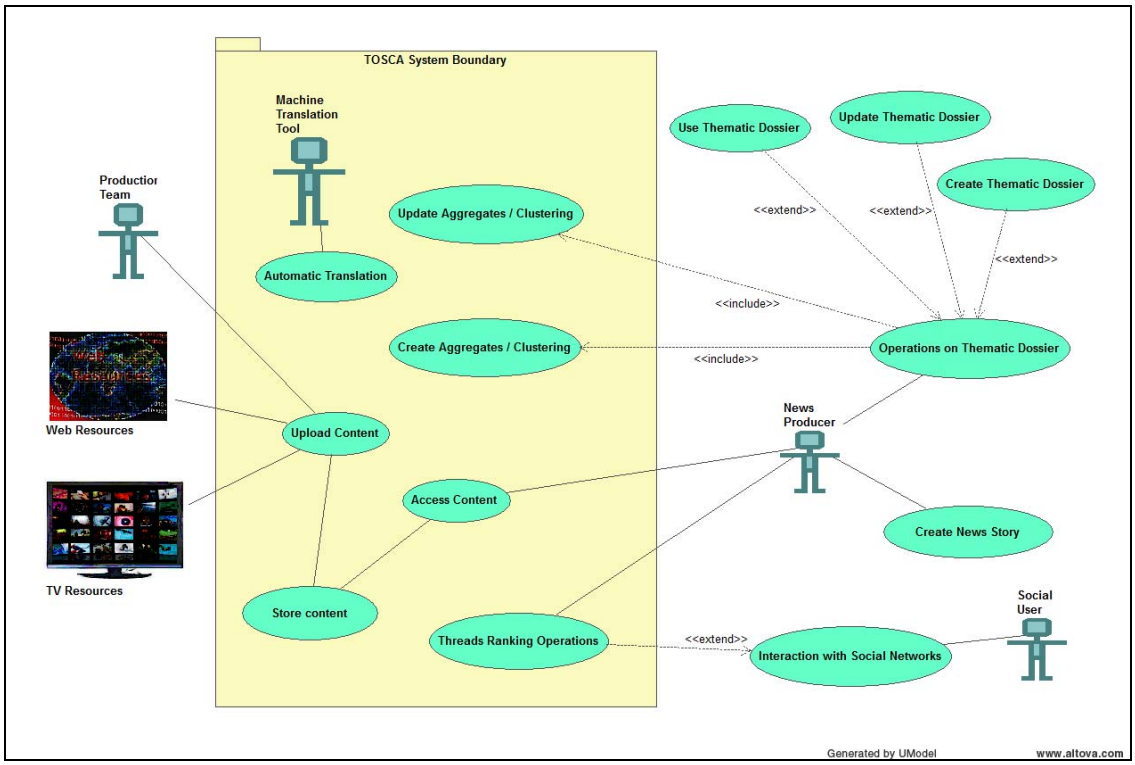

Figure 9. TOSCAMP-BG3_S1.

3.2.5 Customised & Personalised Internet and Mobile Informative Services (BG4)

Field	**Description**
Unique ID	TOSCAMP-BG4
Short name	Customised & Personalised Internet and Mobile Informative Services
Type	Business goal
Description	This goal wants to achieve the automatic/assisted production of informative and infotainment services on mobile and internet devices based on the detection and exploitation of current events and personal preferences. The detection is enabled by a continuous analysis of available content streams and of customers' behaviours and preferences. Once detected, interesting events enable the production of multimedia artefacts deliverable on mobile networks or on the internet.
Rationale	Improve the workflow for the creation of automatic personalised services and for the delivery of such services on several devices. Refine methods to implement user profiling.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Could have

3.2.5.1 Related Scenarios

Personalised News Stories service

Field	**Description**
Unique ID	TOSCAMP-BG4_S1
Short name	Personalised News Stories service
Related to	*3.2.5* Customised & Personalised Internet and Mobile Informative Services 3.2.1 Fast retrieval of very recent material
Involved actors	News editorial department, End user, Profile Manager
Detailed operational description	The news editorial department produces news stories every day. When the production of a specific story is ready, it is automatically ingested back into the central repository through an upload operation where the content is also automatically annotated. Connected with the repository is a system that classifies and clusters these stories into topics. The same happens for other sources of information such as international news feeds. Each news belonging to a feed is automatically classified and linked to the event the topic is about. The end user can, at any time, ask for a personalized news story. At that moment, the central system is queried and the list of recent events is matched with the user's profile and preferences by a Profile Manager. When matching stories are found, they are converted for mobile play-out in real-time and streamed to the mobile device.
Problems and challenges	• Definition of topic is critical • Granularity of topic • Topic-orientated clustering • Heterogeneity of data, including different languages • Personalisation implies definition of implicit or explicit profiles, integration with social data. • Real-time conversion of content
Additional materials	UML diagram see Figure 10

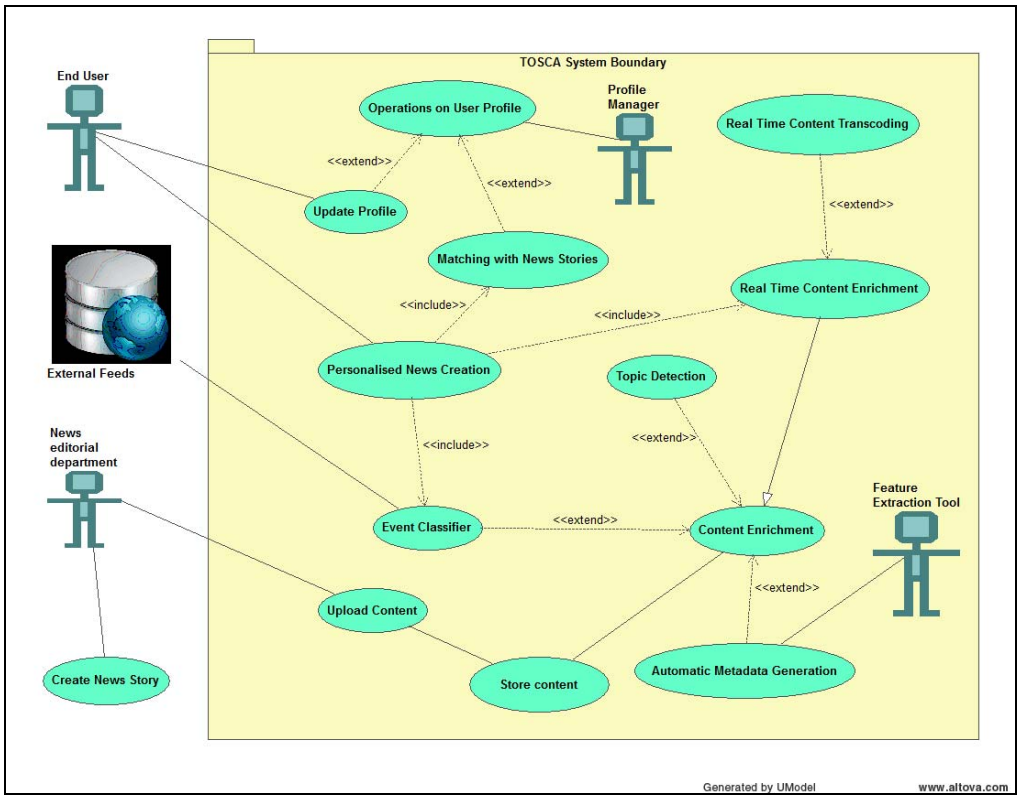

Figure 10. TOSCAMP-BG4_S1.

3.2.6 Multimodal Interfaces for Interactive / Augmented Reality Services (BG5)

Field	**Description**
Unique ID	TOSCAMP-BG5
Short name	Multimodal Interfaces for Interactive / Augmented Reality Services
Type	Business goal
Description	This business goal address the intention to automatically produce data for multimodal interfaces and augmented reality services, starting from the on-demand analysis of the audiovisual content that is being scheduled for broadcasting. For example, the production of face clusters and subsequent face identification to enable a browsing application of scenes in which actors appear.
Rationale	Improve automatic generation of metadata and contents to enable enriched augmented reality – based services. Different metadata and content formats to be integrated into advanced multimodal interfaces are considered.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Could Have

3.2.6.1 Related Scenarios

Enhanced Content Guide Service

Field	**Description**
Unique ID	TOSCAMP-BG5_S1
Short name	Enhanced Content Guide Service
Related To	3.2.6 Multimodal Interfaces for Interactive / Augmented Reality Services
Involved actors	Interactive Services Producers
Detailed operational description	In this scenario the intention is to produce metadata associated to *objects* belonging to offline and live audiovisual content in an automatic way. In particular, the focus will be on face detection and clustering to find similar faces and related temporal occurrences. Moreover face detection and tracking will be also taken into account for punctual tagging. This scenario would enable video search features, fast browsing of retrieved media clips, automatic *event* (e.g. "specific face") alerting, for production purposes but also to provide value added services to the final end-users.
Problems and challenges	• Efficiency of face detection may be not sufficient for the service • Efficiency of recognition and clustering may be not sufficient for the service • Object tracking is in general very challenging for streaming video
Additional materials	UML diagram see Figure 11

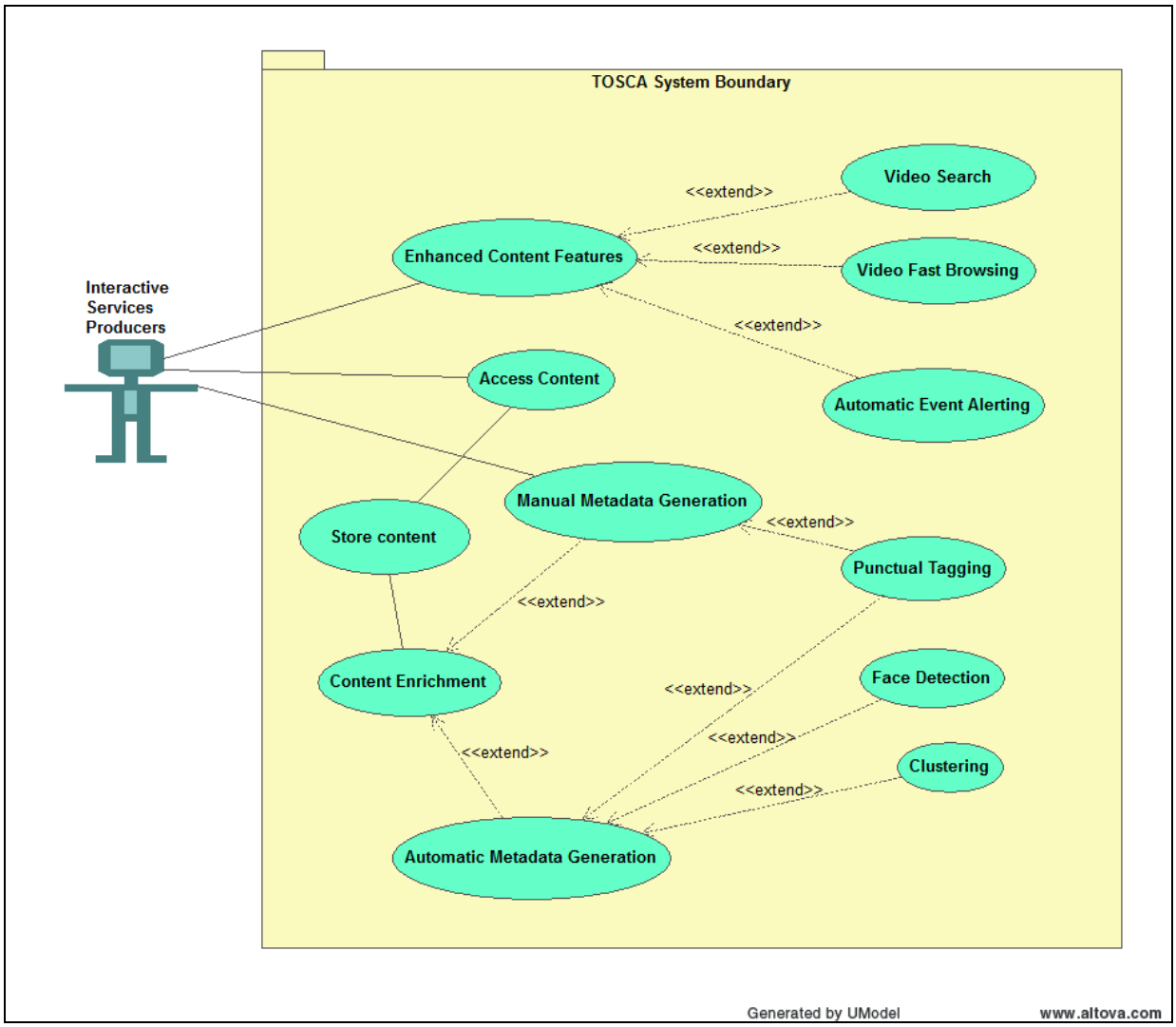

Figure 11. TOSCAMP-BG5_S1.

3.2.7 Efficient Video Quality Assessment of HD Material and of Archived Material (BG6)

Field	**Description**
Unique ID	TOSCAMP-BG6
Short name	Efficient Video Quality Assessment of HD Material and of Archived Material
Type	Business goal
Description	This scenario relates to the need to have a high-performance and high-throughput analysis platform that is able to detect defects in HD material, e.g. coding artefacts, and in archived material, e.g. picture degradation artefacts. The platform should be able to produce reports at different levels of granularity, thus enabling subsequent decisions in the production flow.

Rationale	Use visual quality as query parameter, allowing professional users to specify and assess whether material is appropriate for reuse in production with specific minimally acceptable requirements in terms of quality and resolution.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Could have

3.2.7.1 Related Scenarios

Highlights of a TV show for its 40 year celebration show

Field	**Description**
Unique ID	TOSCAMP-BG6_S1
Short name	Highlights of a TV show for its 40 year celebration show
Related To	3.2.7 Efficient Video Quality Assessment of HD Material and of Archived Material
Involved actors	System Operator, Production Team of TV show, Quality Assessment Expert
Detailed operational description	A broadcaster produces a very successful Saturday evening TV show, running already for 40 years. For this anniversary, a documentary (to be broadcast in HD) with memorable moments from the show is planned, and even more clips from historical episodes will be provided on the Web. Automatic quality analysis is used to detect defects and describe quality parameters of the material on all material. Depending on the quality assessment results, the production team can choose clips that are of sufficient quality to be included in the documentary, while other clips, that have insufficient quality for broadcasting but are free of severe defects, might still be suitable to be put on the Web. For a few episodes, the team performs a detailed validation of the automatic results, which is used to train an automatic algorithm to propose further clips as suitable for Web or HD use based on the detected defects.
Problems and challenges	• High-throughput quality analysis tools • Reliable detection performance • Combining different quality measures to an overall assessment • Putting quality analysis measures in relation to human judgements • Retrieval systems supporting querying quality metadata
Additional materials	UML diagram see Figure 12

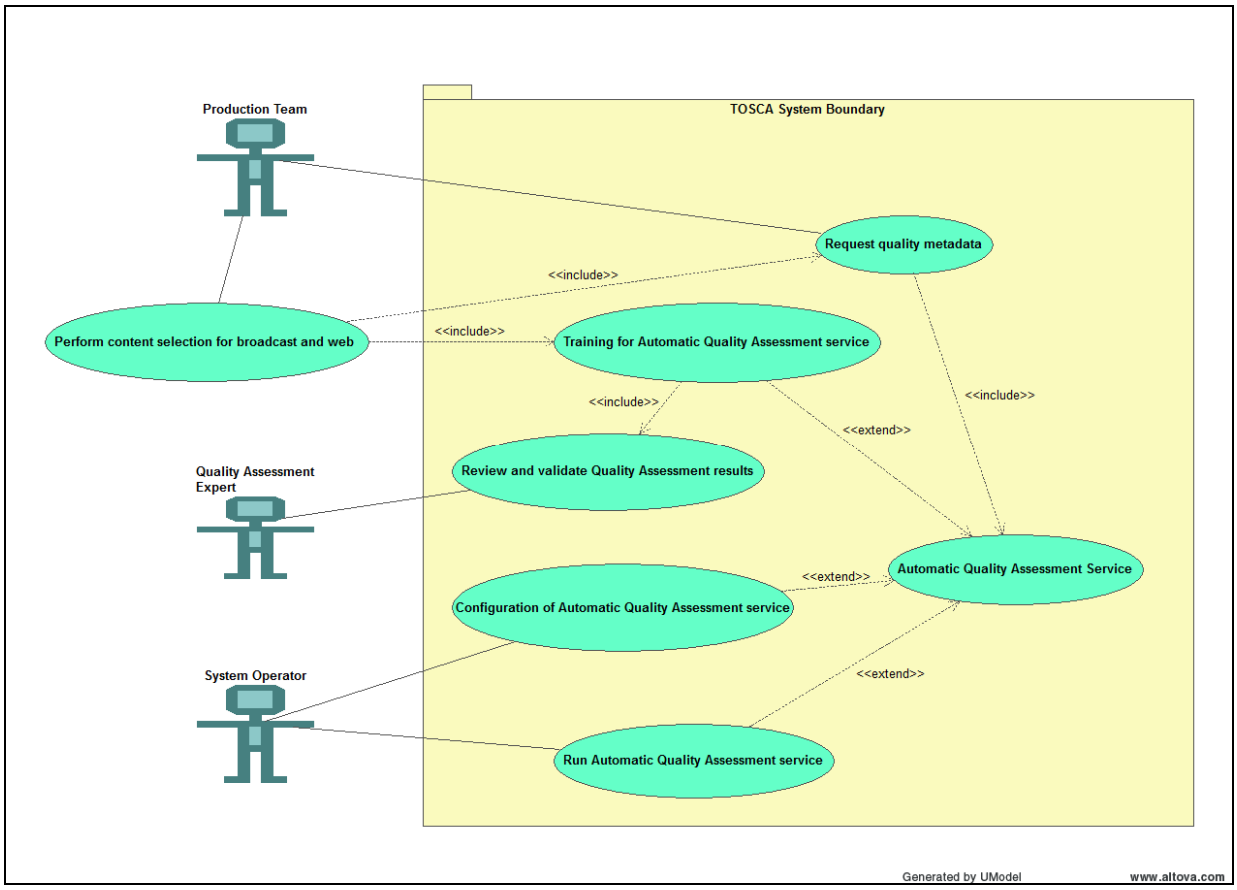

Figure 12. TOSCAMP-BG6_S1.

Providing material for Ultra-HD production

Field	**Description**
Unique ID	TOSCAMP-BG6_S2
Short name	Providing material for Ultra-HD production
Related To	3.2.7 Efficient Video Quality Assessment of HD Material and of Archived Material
Involved actors	System Operator, Production Team, Quality Assessment Expert
Detailed operational description	After a successful test at the Summer Olympics 2012, Ultra-HD is also used for the Winter Olympics in 2014. Between the actual sports events, short programmes about the history of the Winter Olympics are included in the broadcast. In addition to their editorial content, these clips must also have as high resolution as possible (e.g., 4K scans from film material), appropriate contrast, low noise/grain etc. The team producing the content will also need to query other audiovisual archives, and in order to reduce the result sets to items that can actually be used, the queries include the requirements on quality. Automatic quality analysis is used to detect defects and describe quality parameters of the

	material on all material. Depending on the quality assessment results, the production team can choose clips that are of sufficient quality to be included in the programmes.
Problems and challenges	In addition to the ones stated for BG6-S1: • Interoperable representation of quality measures • Quality analysis tools capable of efficiently analysing high-resolution content
Additional materials	UML diagram see Figure 13

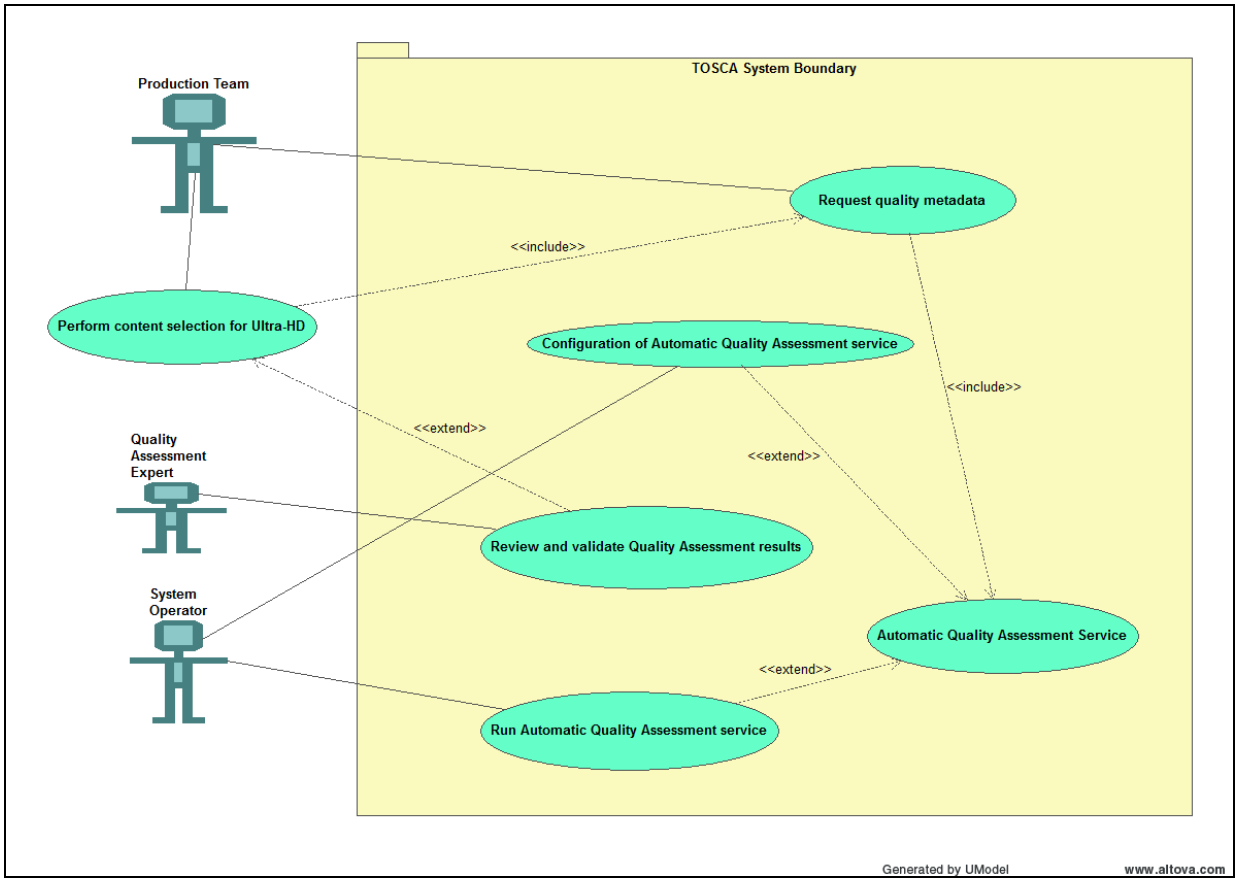

Figure 13. TOSCAMP-BG6_S2.

3.2.8 Advanced Personalised Experience on Documentaries Creation (BG7)

Field	**Description**
Unique ID	TOSCAMP-BG7
Short name	Advanced Personalised Experience on Documentaries Creation
Type	Business goal

Description	This business goal relates to the need to seamlessly integrate content items in distributed repositories in the production workflow of documentary, fictional or informative material. This is done through analysis and indexing of repositories, matching/clustering of items, users' involvement in the workflow and final prototyping (e.g., through production of rough cuts) and authoring.
Rationale	Facilitate the professional user in building new productions through advanced interfaces and workflow. Involve grassroots users in editorial work, this improving creativity and product innovation.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Could have

3.2.8.1 Related Scenarios

Life Documentary

Field	**Description**
Unique ID	TOSCAMP-BG7_S1
Short name	Life Documentary
Related To	3.2.8 Advanced Personalised Experience on Documentaries Creation
Involved actors	Content producer, Documentary Editorial Staff
Detailed operational description	Paul and Linda work in the Editorial Staff for an important documentary content producer. Paul is working on a documentary about the life of Steve Jobs since a while. To continue, he first logs in into a central system which has access to a number of distributed content and metadata repositories using his personal account. He has now access to all of his previous projects and chooses the project related to Steve Jobs' life. As a next step, Paul uploads some material about Steve Jobs he has found on the web. Because the material is in Italian language, Paul uses an automatic speech translation in order to translate the audio to English. Furthermore, he decides to run some automatic metadata extraction algorithms in order to get a basic set of data. Because he recognizes some persons Steve Job is talking with, he also adds the corresponding name annotations manually. Paul continues now with the assembly of his documentation. Using advanced search algorithms, he looks for unknown material in the system about Steve Jobs from the time he was not known very well. This search retrieves some scenes which could be well used. Therefore, Paul adds parts of these scenes to the already existing pool for his documentary. The central system does not replicate the data, but stores the corresponding links in Paul's project. This enhances the performance of the workflow

	significantly. After finishing the gathering and a rough assembly of the raw material for the documentation, Paul hands over the project to Linda. Linda works on her own account and imports the existing project from Paul's account. Because no A/V data has to be copied or moved, the import will be accomplished very fast. As a next step, Linda automatically downloads the required source material from the central system to her workstation. This step does not require any manual interaction because it is accomplished based on the already existing identifiers. For bigger projects, this final download can be run in a batch mode over night. With the local copy of the source material, Linda performs the final editing and stores the result back into the central system.
Problems and challenges	The problems and challenges related to this scenario are the following: • The central system has to provide access to distributed repositories of content and metadata in a transparent manner • The central system has to support a user account management. • The central system has to support a project management within the user accounts. Within the project management, a basic editing functionality has to be provided based on links to A/V material and additional information
Additional materials	UML diagram see Figure 14

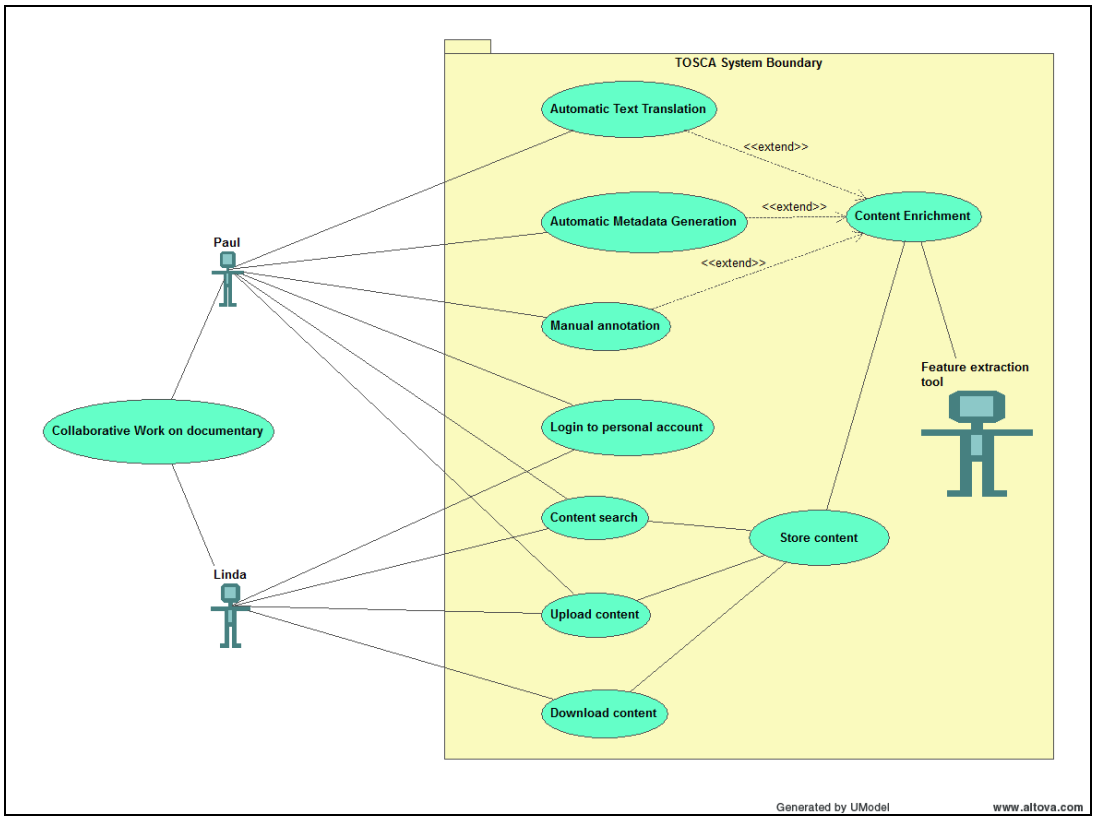

Figure 14. TOSCAMP-BG7_S1

3.2.9 Assisted Production of Sports Events (BG8)

Field	**Description**
Unique ID	TOSCAMP-BG8
Short name	Assisted Production of Sports Events
Type	Business goal
Description	This business goal addresses the need of a platform capable of assisting editors of sports programmes/events to automatically detect highlights and produce excerpts and summaries to be used as parts of broadcasted/web-published content items. These items can be optionally enriched with metadata searched and collected from external sources, and reformatted according to the delivery platform (e.g. graphics, teletext, MHP).
Rationale	Enable sport editorial staffs to easily build new productions or enrich existing ones, reducing the need of resources. This is done not only seamlessly and efficiently by accessing to automatically extracted metadata and distributed contents, but also processing contents in different ways when needed.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Should have

3.2.9.1 Related Scenarios

Summary of downhill race

Field	**Description**
Unique ID	TOSCAMP-BG8_S1
Short name	Summary of downhill race
Related To	3.2.9 Assisted Production of Sports Events
Involved actors	Editor/journalist of sports department, System Operator
Detailed operational description	The sports department of a broadcaster in an alpine region reports on a downhill skiing race. One of their tasks is to produce a summary of the race for a sports magazine in the evening of the same day, as well as a 2 minute summary of the highlights to be included in a news broadcast. While the event is still in progress, automatic analysis tools process the incoming content in order

	to generate annotations, such as relevant events. Part of the content contains interviews with athletes, but as they do not speak the local language, this interview is transcribed and translated in order to locate relevant sections. After the event, a summarization algorithm, which has been retrained on a relatively small content set to adapt to downhill, proposes clips to be included in the summaries of different length, and the sports journalist can make a final selection and adjustments.
Problems and challenges	• Events and annotations should not be specific to a certain type of sports, but algorithms must support training to other types • Summarization and highlight selection: it should be possible to train them in a semi-supervised way, e.g. by providing raw materials and human generated summaries, and by providing feedback and clips proposed for inclusion in the summary • As discussed at the kick-off meeting, sports commentator ASR is considered a hard problem and not expected to yield reliable results • There might be specific requirements when considering e.g. summaries for Web or mobile content; however, things like automatic image retargeting/reframing are out of scope of TOSCA-MP, the only thing that might be relevant is proving metadata on the centre of action/attention as input for such algorithms
Additional materials	UML diagram see Figure 15

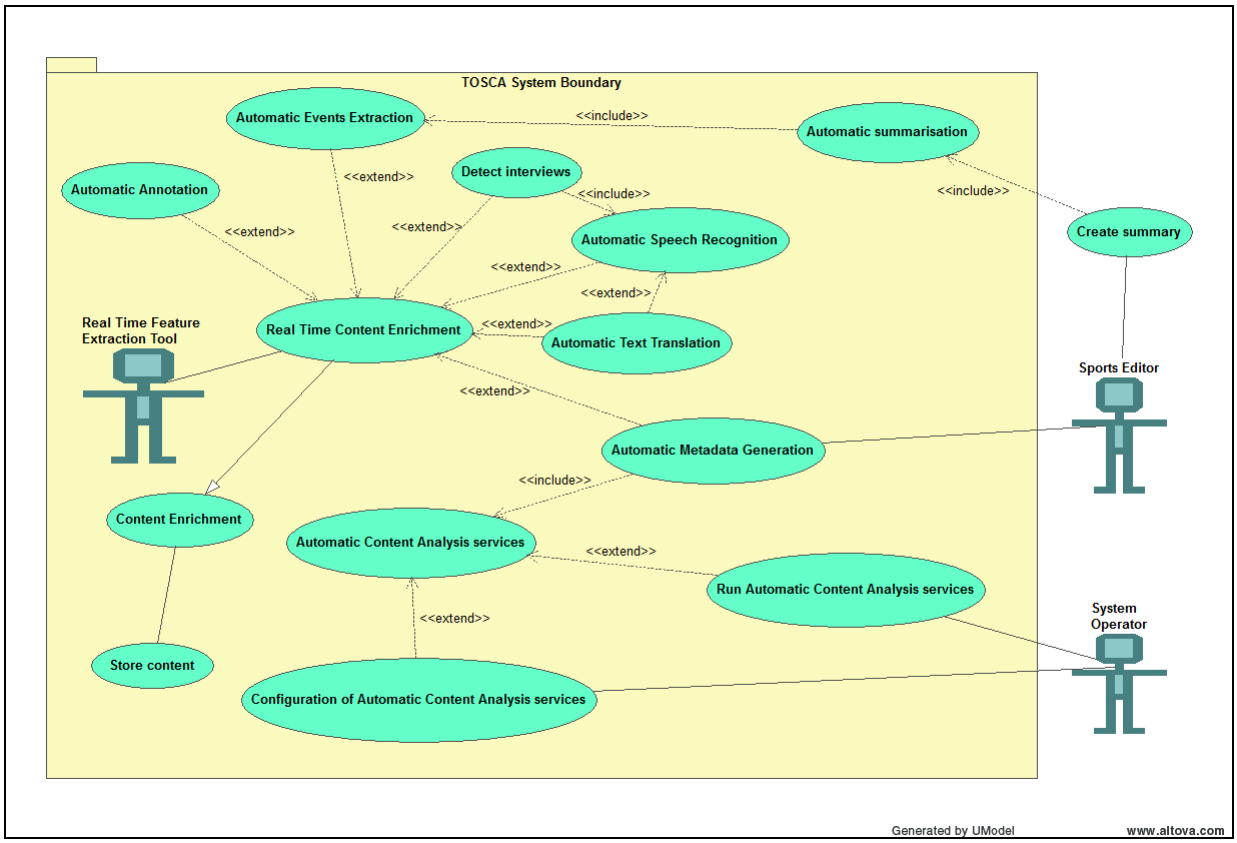

Figure 15. TOSCAMP-BG8_S1.

Summary of downhill world cup season

Field	**Description**
Unique ID	TOSCAMP-BG8_S2
Short name	Summary of downhill world cup season
Related To	3.2.9 Assisted Production of Sports Events
Involved actors	Editor journalist of sports department
Detailed operational description	At the end of the ski world cup season, a sports journalist is working on a summary of the highlights of the downhill races. She can build on the available metadata about highlights used in the summaries of individual races, and access also the same metadata of the national broadcaster of the country, which was unusually successful in that season. Based on statistics about the season, the journalist can easily build a query that selects the clips with both the most successful skiers of that season as well as unexpected winners of some races.
Problems and challenges	• Independence of type of sports as described in BG8_S1 • Use statistical information provided as LOD in the query interface, provide tools to include it in the query

	• Notes o The BG description mentions accessing statistical information, this seems only in scope of TOSCA-MP when actually using it for content search o Not sure whether preparing data for graphics/overlays is still in scope
Additional materials	UML diagram see Figure 16

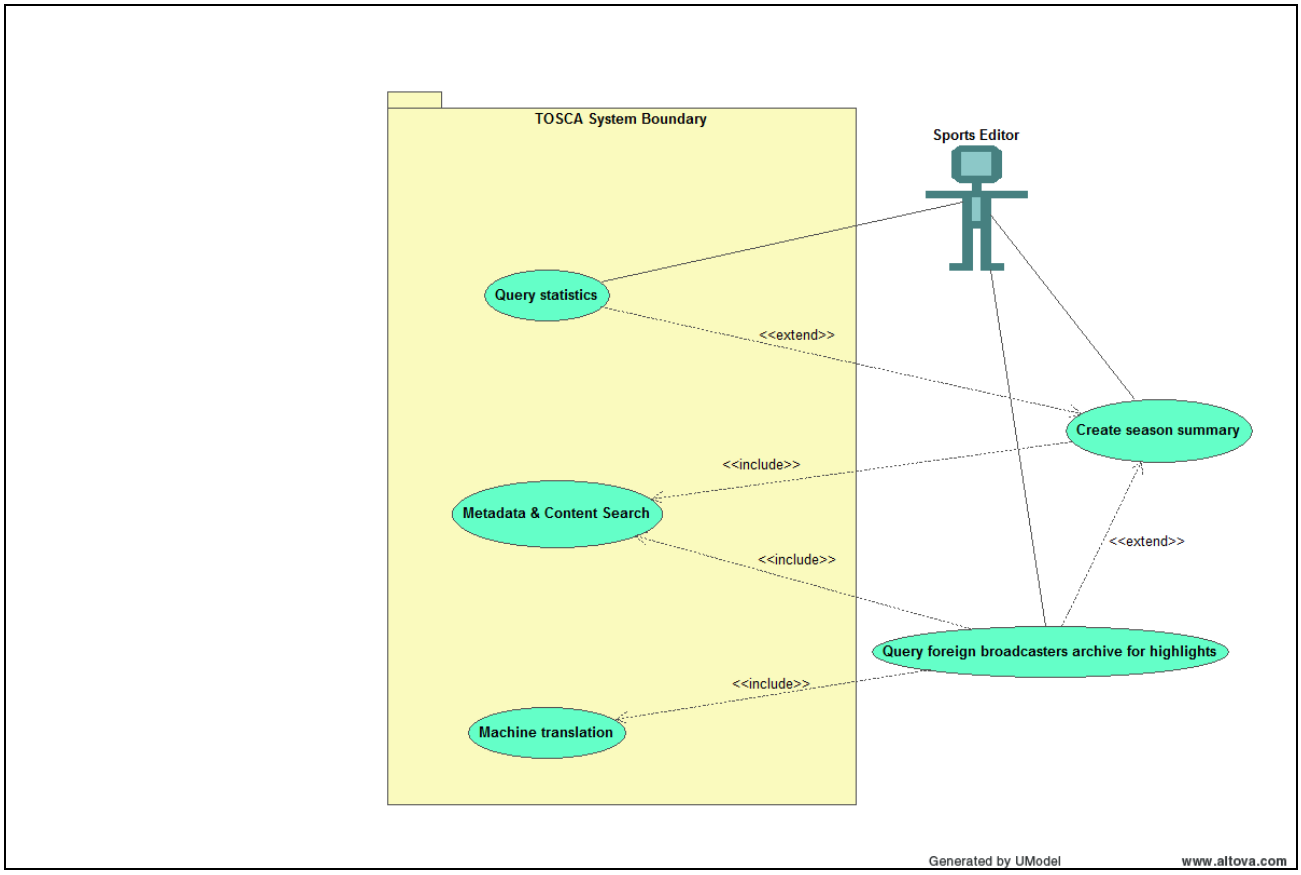

Figure 16. TOSCAMP-BG8_S2.

3.2.10 Distributed repository for all steps in metadata production and usage chain (BG9)

Field	**Description**
Unique ID	TOSCAMP-BG9
Short name	Distributed repository for all steps in metadata production and usage chain.
Type	Business goal
Description	The business goal addresses the need in modern distributed media production facilities to accumulate content files and all types of related metadata in one central repository for the overall production and usage chain. All steps in such a distributed chain can produce new metadata, can use the information of already available metadata or can combine or aggregate metadata. The distributed repository application has the intention to collect different locally separated repositories to one global accessible system and provide common global interfaces specialized for content production, post-production and search, browsing and recommendation steps.
Rationale	In the future we will have global distributed production chains and for that we have a need for central storage interfaces for content and metadata. The metadata business chance is to provide content and metadata on different distributed applications for metadata production, post-production, search and recommendation.
Involved Stakeholder	*Involved stakeholders are detailed in the individual scenarios of this business goal*
Priority of accomplishment	Must have

3.2.10.1 Related Scenarios

Distributed content metadata production and post-production

Field	**Description**
Unique ID	TOSCAMP-BG9_S1
Short name	Distributed content metadata production and post-production
Related To	3.2.10 Distributed repository for all steps in metadata production and usage chain
Involved actors	Broadcast Company Employee, System Operator

Detailed operational description	Alessandro is an employee of a big international broadcast company and responsible for archiving digital news content produced within his local studio. To enrich content with a set of standardized semantic linked metadata, he has access to a service for automatic low level metadata generation located in the headquarter of the globally active international broadcaster. As a first step he uses dedicated interfaces to upload the content and the associated already available metadata (e.g. archive metadata, metadata coming from the production and from the editorial department – e.g. teleprompter data, character generator data, lower third data, subtitles). As a second step Alessandro chooses the required metadata services from the available ones from his desktop through a web application. Michael, who works at the headquarters, is responsible for the available services into the system. He starts and controls the automatic metadata processing jobs, which are defined by Alessandro. When the jobs are completed, the automatic generated metadata are collected in a central repository in relation to the content files. For some other special content analysis services, which are only available in another facility of the broadcaster, metadata will be generated and collected in a transparent way to the user. Beside this automatic low level metadata generation, Alessandro can also order services for semantic annotation and linking of the metadata and for linking of the metadata to other metadata already available in the global distributed repository. Such services will be provided from a department in the headquarter of the broadcaster where highly optimized applications to do this job in a semi-automatic way are deployed. These applications will also work direct on interfaces of the distributed repository. The repository provides access to all content files and metadata (including semantic links) distributed over the facilities of the broadcaster. At the end of the day, Alessandro has integrated the new content in the global distributed repository of the broadcaster, the content in the video files are described with semantic linked metadata, which are also saved in the distributed repository. The distributed repository enables access to the content and metadata in all facilities of the globally active broadcaster.
Problems and challenges	The problems and challenges related to this scenario are the following: • Central repository with common access interfaces for all steps in metadata production across different sites of a content producer • Central availability of content, low level metadata and semantic links of metadata, which are saved on different distributed databases and file systems.
Additional materials	UML diagram see Figure 17

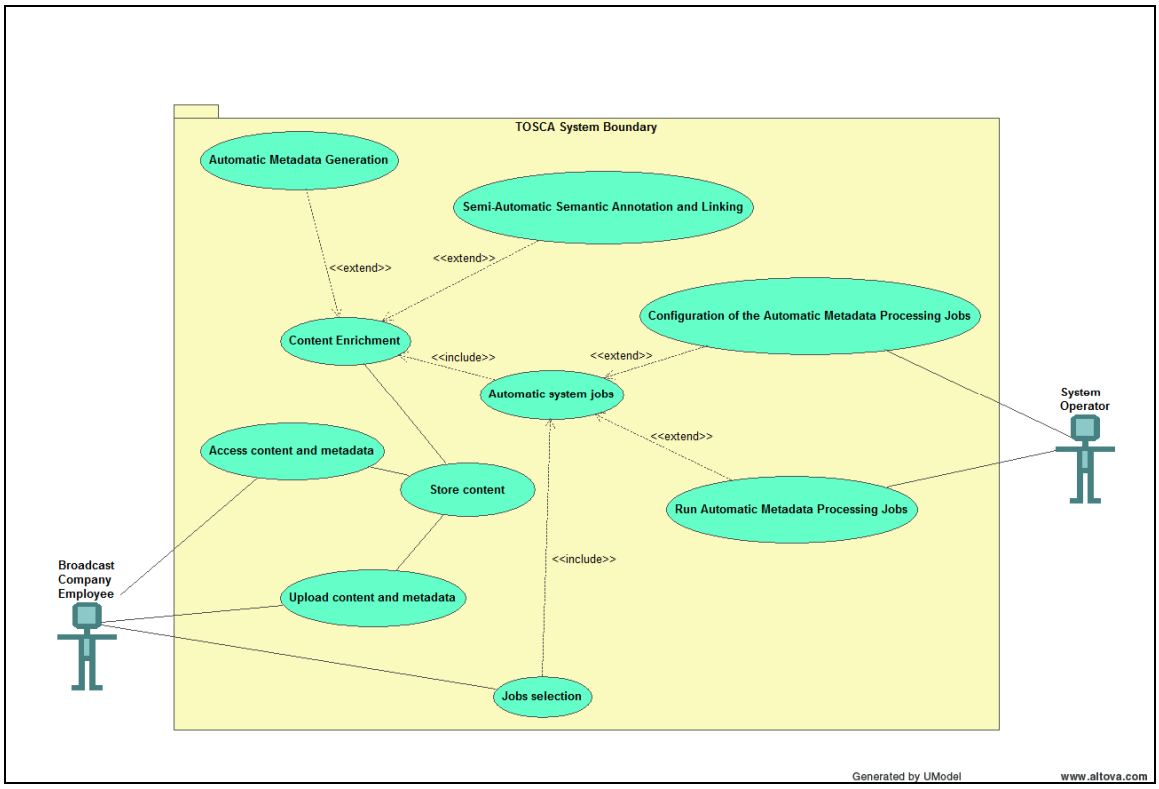

Figure 17. TOSCAMP-BG9_S1

Distributed search and recommendation

Field	**Description**
Unique ID	TOSCAMP-BG9_S2
Short name	Distributed search and recommendation
Related To	3.2.10 Distributed repository for all steps in metadata production and usage chain
Involved actors	Content editor
Detailed operational description	Paul is an editor of a scientific magazine of globally active broadcaster. For his next show, he needs material for a dedicated scientific topic with specific conditions. To get content on his topic from all databases in all facilities of the broadcaster, Paul uses a semantic search service made available by a central system which will execute his search request on all included databases and will collect the results. In addition, based on the globally semantic linked metadata, the system is able to provide recommendations for other content which could also fit Paul's topic.
Problems and challenges	• Search across local database/ repository boundaries • Linking of metadata/information across local database/ repository boundaries
Additional materials	UML diagram see Figure 18

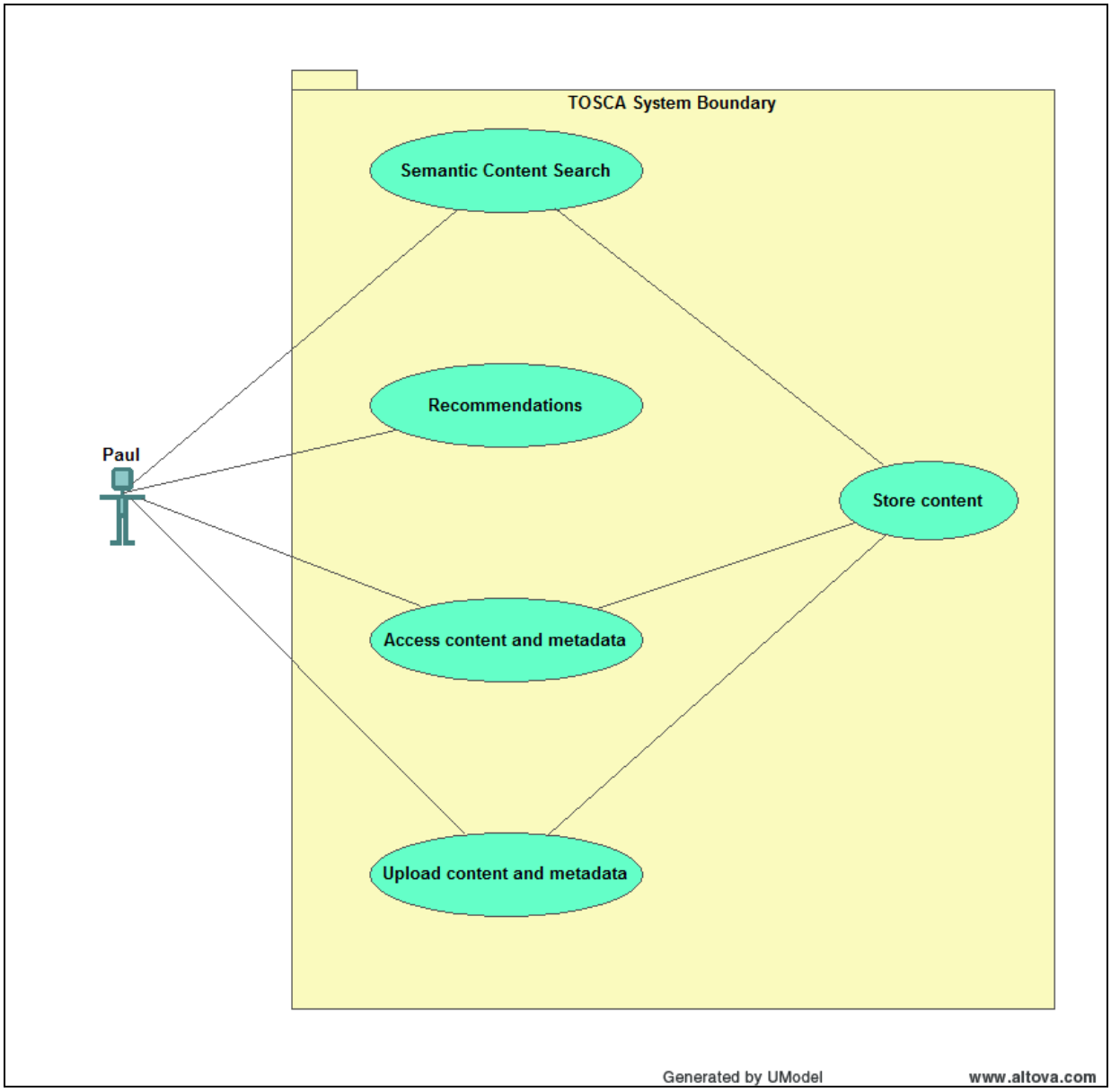

Figure 18. TOSCAMP-BG9_S2.

4 Further Analyses

4.1 Breakdown of TOSCA-MP planned advancements w.r.t. business goals and scenarios

The following Table 3 reports the breakdown of TOSCA-MP advancements (as described in Annex I – Description of Work) with respect to the business goals and usage scenarios illustrated in the previous sections. The goal of this analysis is twofold: verify that the usage scenarios are in line with the planned capabilities of the system and provide a first rough association between the planned capabilities to be developed and the scenarios to be demonstrated. It has to be noticed that in the analysis reflected in Table 3, advancements have to be intended in the following manifold way:

- ***research*** advancements, i.e. activities that lead to substantive improvement in the scientific and/or technical state of the art of a certain research field;
- ***development*** advancements, i.e. activities that improve existing technologies by adding new models, new data sets, new testing methodologies, new results;
- ***functionality*** advancements, i.e. activities that improve existing techniques by adding novel functionalities to the set of pre-existing ones in order to support new use cases;

Thus, when a “YES” is marked in the crossing point between an advancement and a business goal, this has the meaning of stating that the specific business goal is relevant for/will benefit from the achievement of the corresponding advancement, be this functional, development or research.

Similarly for “MAYBE” and “NO”, the latter meaning that no particular impact/benefit is foreseen on/for the business goal from the achievement of the corresponding advancement, the former meaning that there is not sufficient evidence for decision at this stage of the project.

Research area	Related objective	Advances by TOSCA-MP	BG1.1	BG1.2	BG2	BG3	BG4	BG5	BG6	BG7	BG8	BG9	Overall
Multilingual speech metadata extraction	scalable advanced distributed processing	speech recognition of different genres and languages, and translation on corpora containing different genres and languages	MAYBE Only if performance is good enough	MAYBE	YES ASR results are used for search and retrieval in scenarios. In scenario 1 there is access from a different broadcaster. Translation is a key functionality in scenario 3	YES Scenarios mention that content may be in more than one language. Scenario 1 mentions multilingual clustering which implies translation	YES Scenarios explicitly mention that content may be in more than one language	NO	NO	YES Scenarios explicitly mentions content in more than one language. There is mention of translation service	YES Scenarios explicitly mention that content may be in more than one language. There is explicit mention of a translation service.	YES ASR and MT are basic metadata extraction services	**6 YES** **2 MAYBE** **2 NO**
Content-adaptive visual metadata extraction and enrichment	scalable advanced distributed processing	genre-adaptive visual analysis methods, integration of domain knowledge and semantic information into the visual analysis process	YES Generic but different from those used in BG1.2 because performance is a key issue	YES generic but different from those used in BG1.1	YES Scenario 2 implies that processing is launched depending on content features	MAYBE If content to be aggregated is not only news content	YES The Scenario implies recognition of the type of content before annotation takes place	YES Some automatic metadata generation may be discarded or included depending on the specific content	NO	MAYBE	YES e.g., different sports may require different heuristics for segmentation	NO	**6 YES** **2 MAYBE** **2 NO**
Aligning and linking metadata	scalable advanced distributed processing	indexes combining various types of time-based metadata, including support for content clustering	YES Is a key functionality	YES Is a key functionality	YES For scenario 2 there is the need to possibly link knowledge from external repositories.	YES Links to social networks are mentioned	YES In order to take into account personal preferences external repositories may be used	YES The focus is on face detection and clustering. Services may include references to external sources attached to (identified) faces.	YES Quality parameters may be on different time bases and can be used for filtering content	YES Metadata are linked depending on the target production topic	YES Scenario 2 mention s access to a national broadcaster metadata repository	YES Both scenarios explicitly mention the use of metadata linking	**10 YES** **0 MAYBE** **0 NO**

Research area	Related objective	Advances by TOSCA-MP	BG1.1	BG1.2	BG2	BG3	BG4	BG5	BG6	BG7	BG8	BG9	Overall
Task-adaptive search & retrieval	seamlessly use content from distributed heterogeneous repositories	task-adaptive search & retrieval methods based on semantic information	YES Different indexing and retrieval tools configured and tasks performed, depending on the production	YES Different indexing and retrieval tools configured and tasks performed, depending on the production	YES For scenario 2 in the sense of clustering/organising content, While For scenario 1 probably NO	YES Depending on the specific topic to be aggregated and documented there might be specific S&R methods	MAYBE Different classes of users may require that the S&R system behaves differently to meet specific user preferences	NO	NO	YES Different types of documentaries may require several different S&R capabilities and data sources	YES The two scenarios, even if referred to the same sport, requires different S&R functionalities	YES To get content on his topic from all databases in all facilities of the broadcaster, a centralised semantic search service is used	**7 YES** **1 MAYBE** **2 NO**
User feedback	seamlessly use content from distributed heterogeneous repositories	integration of implicit user feedback	NO	YES Through “metadata verification” use case	YES Scenario 3 implies feedback from the documentalists both on transcribed and translated material	NO	MAYBE Users may be able to classify back as non relevant some of the presented stories	YES Service Producers may discard inaccurate metadata before publishing the data on the service	YES Quality results may be inaccurate	MAYBE Collaborative production may require the system to adapt to users’ feedback	YES Summarisation and highlights creation tasks are always subject to possible inaccuracies	NO	**5 YES** **2 MAYBE** **3 NO**
User interfaces result presentation	seamlessly use content from distributed heterogeneous repositories	flexible, interactive and task-aware presentation of results	YES generic	YES generic	YES Presentation of e.g. of clustering results is important for process selection,	YES Inherent multimodality of content requires advanced capabilities in browsing	YES Inherent multimodality of content requires advanced capabilities in browsing	YES Interactivity is a key element in augmented reality services	YES the production team can choose clips that are of sufficient quality If quality results are very complex and span at different	YES In some phases of the collaborative production, manually annotation depends strongly from the result representation.	YES A manually annotation depends strongly from the result representation.	YES The distributed repository makes the user able to access all content and metadata in the broadcaster facility	**10 YES** **0 MAYBE** **0 NO**

Research area	Related objective	Advances by TOSCA-MP	BG1.1	BG1.2	BG2	BG3	BG4	BG5	BG6	BG7	BG8	BG9	Overall
									levels of granularity				
User interfaces for annotation	seamlessly use content from distributed heterogeneous repositories	collaborative annotation integration different sources of metadata,	MAYBE	MAYBE	YES Scenario 3 has a “refine and correct transcript” use case	NO	MAYBE	MAYBE Having no technology to recognize & cluster faces users have to do it.	NO	YES The collaborative aspect is the key element of this BG	YES In scenario 2 There is integration with broadcaster’s metadata	NO	**3 YES** **4 MAYBE** **3 NO**

Research area	Related objective	Advances by TOSCA-MP	BG1.1	BG1.2	BG2	BG3	BG4	BG5	BG6	BG7	BG8	BG9	Overall
Task models		task models for metadata creation and retrieval tasks	YES These are representation of knowledge used to select/configure task-dependant tools	YES These are representation of knowledge used to select/configure task-dependant tools	YES In scenario 2, task models represent processing chains that are applied to content	NO	NO	MAYBE	YES Quality tasks may be different depending on the kind of material to be assessed	YES The collaborative production may span on several methodologies and workflow	YES The two scenarios, even if referred to the same sport, uses different tasks	NO	**6 YES** **1 MAYBE** **3 NO**
Benchmarking	make benchmarking an integrated part of the workflow	benchmarking based on media production tasks	MAYBE Typically not enough time to perform fine tuning of tools for new material.	YES Metadata annotation and verification are sources of data for benchmarking	YES Corrections of transcripts (scenario 3) are useful inputs for benchmarking engine.	MAYBE samples of the detected aggregations might be used to fine tune the aggregation	NO	YES Specific automatic metadata extraction tool must be benchmarked in advance	YES It is a key functionality for quality assessment	NO	MAYBE	N/A	**4 YES** **3 MAYBE** **2 NO**
Scalable distributed repository framework for digital media production workflows	seamlessly use content from distributed heterogeneous repositories	distributed repository framework for all stages of the process, service oriented architecture using open standards	YES Efficient communication and exchange of data has to be ensured	YES	YES A fundamental functionality in scenario 1 and 3	YES Sources to be aggregated are disparate sources	NO	MAYBE	YES Scenario 2 mentions queries to archives	YES It is a key functionality of the scenario	YES In scenario 2 There is integration with broad-caster's metadata. It should be accessible	YES	**8 YES** **1 MAYBE** **1 NO**
11 research areas	**3 objectives**	**10 advancements**	**6 YES** **1 NO** **3 MAYBE**	**8 YES** **0 NO** **2 MAYBE**	**10 YES** **0 NO** **0 MAYBE**	**5 YES** **3 NO** **2 MAYBE**	**4 YES** **3 NO** **3 MAYBE**	**5 YES** **2 NO** **3 MAYBE**	**6 YES** **4 NO** **0 MAYBE**	**7 YES** **1 NO** **2 MAYBE**	**9 YES** **0 NO** **1 MAYBE**	**5 YES** **4 NO** **0 MAYBE**	**65 YES** **18 NO** **16 MAYBE**

Table 3. Breakdown of TOSCA-MP advancements w.r.t. business goals and scenarios

4.1.1 Considerations of relation between usage scenarios and planned advancements

From the analysis of Table 3 it results that there is a good balance between required usage functionalities and planned advancements. In fact all advancements (rows in the table) correspond to a substantive number of “YES”, and each business goal (columns in the table) , with its respective scenarios, touches upon a good number of planned advancements. Overall the matrix scores 65 YES, 18 NO and 16 MAYBE indications.

This means that on one hand the overall usage scenario analysis is quite consistent with the developments that the project plans to achieve. This finding also tells that the foreseen advancements of the system match positively with the expectations of the users.

On the other hand, being planned advancements definitely cross-scenario it is expected that the resulting architecture will benefit from a service orientated design, due to the loose-coupling of components and horizontal scalability of this approach. This approach is expected to further foster novel usages during the development of the project, which were unseen at the time of the present analysis.

4.2 Use case clusters in usage scenarios

In this Section we identify a set of use cases clusters, derived by functionally-wise aggregating use cases included in each of the usage scenarios described in Section 3.2. This analysis helps in understanding distinct functional elements that the system will have to support in order to cover requirements underlying business goals and usage scenarios, and consequently to efficiently break down development efforts in the subsequent phases of the project.

Section 4.2.11 gives a synoptic view of the clusters, which were further aggregated into two areas: data-centred and process-centred functionalities.

4.2.1 Automatic Metadata Extraction

This use case aggregation collects use cases pertaining the area of automated information extraction from content analysis, i.e. without the need of integrating external knowledge to that already derivable from the content.

Automatic Metadata Generation: TOSCAMP-BG1.1_S1, TOSCAMP-BG1.2_S1, TOSCAMP-BG2_S1, TOSCAMP-BG9_S1, TOSCAMP-BG4_S1, TOSCAMP-BG5_S1, TOSCAMP-BG7_S1, TOSCAMP-BG8_S1

Semi-Automatic Subtitles Generation: TOSCAMP-BG2_S3

Automatic Speech Recognition: TOSCAMP-BG2_S2, TOSCAMP-BG2_S3, TOSCAMP-BG8_S1

Automatic Text Translation: TOSCAMP-BG2_S3, TOSCAMP-BG3_S1, TOSCAMP-BG7_S1, TOSCAMP-BG8_S1

Machine translation: TOSCAMP-BG8_S2

Automatic Genre Characterisation: TOSCAMP-BG2_S2, TOSCAMP-BG1.1_S1 (as Topic Detection), TOSCAMP-BG4_S1 (as Topic Detection)

4.2.2 Basic Content Management Operations

This use case aggregation collects use cases pertaining the area of basic content management, i.e. the set of functionalities that the system will have to accomplish to support access and upload of content and metadata.

Upload content: TOSCAMP-BG1.1_S1, TOSCAMP-BG2_S1, TOSCAMP-BG2_S3, TOSCAMP-BG3_S1, TOSCAMP-BG9_S1, TOSCAMP-BG4_S1, TOSCAMP-BG7_S1

Download content: TOSCAMP-BG7_S1

Access Content: TOSCAMP-BG2_S2, TOSCAMP-BG3_S1, TOSCAMP-BG9_S1, TOSCAMP-BG5_S1

Access content and metadata TOSCAMP-BG9_S2

Upload content and metadata TOSCAMP-BG9_S2

Store content: TOSCAMP-BG1.1_S1, TOSCAMP-BG1.2_S1, TOSCAMP-BG2_S1, TOSCAMP-BG2_S2, TOSCAMP-BG2_S3, TOSCAMP-BG3_S1, TOSCAMP-BG4_S1, TOSCAMP-BG5_S1, TOSCAMP-BG7_S1, TOSCAMP-BG8_S1, TOSCAMP-BG9_S1, TOSCAMP-BG9_S2

4.2.3 Front-end Functionalities

This use case aggregation collects use cases pertaining the area of user interaction at the front end, i.e. the functionalities expected when users directly interact through GUIs.

Content Search: TOSCAMP-BG1.1_S1, TOSCAMP-BG1.2_S1, TOSCAMP-BG2_S1 (as Semantic Multilingual Content Search), TOSCAMP-BG5_S1 (as Video Search), TOSCAMP-BG7_S1, TOSCAMP-BG8_S2(as Metadata & Content Search) , TOSCAMP-BG9_S2(as Semantic Content Search)

Video Fast Browsing: TOSCAMP-BG5_S1

Query statistics: TOSCAMP-BG8_S2

Real Time Content Transcoding: TOSCAMP-BG4_S1

4.2.4 Manual Annotation and Verification

This use case aggregation collects use cases pertaining the area of manual annotation and verification.

Manual Metadata Generation: TOSCAMP-BG1.2_S1, TOSCAMP-BG2_S1, TOSCAMP-BG5_S1, TOSCAMP-BG7_S1 (as Manual Annotation), TOSCAMP-BG2_S3 (as Manual modification of transcription)

Metadata Verification: TOSCAMP-BG1.2_S1

4.2.5 Video Quality Assessment Services

This use case aggregation collects use cases pertaining the area of video quality assessment.

Automatic Quality Assessment Service: TOSCAMP-BG6_S1, TOSCAMP-BG6_S2

Configuration of Automatic Quality Assessment service: TOSCAMP-BG6_S1, TOSCAMP-BG6_S2

Request quality metadata: TOSCAMP-BG6_S1, TOSCAMP-BG6_S2

Review and validate Quality Assessment results: TOSCAMP-BG6_S1, TOSCAMP-BG6_S2

Automatic Quality Assessment service: TOSCAMP-BG6_S1, TOSCAMP-BG6_S2

4.2.6 Processing and Control Features

This use case aggregation collects use cases pertaining the area of processing and control features, i.e. the functionalities needed by the system to support the relevant process/workflow aspects defined in the usage scenarios.

Automatic Workflow Selection: TOSCAMP-BG2_S2

Manual Workflow Selection: TOSCAMP-BG2_S2

Automatic system jobs: TOSCAMP-BG9_S1

Configuration of the Automatic Metadata Processing Jobs: TOSCAMP-BG9_S1

Jobs selection: TOSCAMP-BG9_S1

Run Automatic Metadata Processing Jobs: TOSCAMP-BG9_S1

Run Automatic Content Analysis services: TOSCAMP-BG8_S1

Configuration of Automatic Content Analysis services: TOSCAMP-BG8_S1

Training for Automatic Quality Assessment service: TOSCAMP-BG6_S1

Create and Use Shared Content Baskets: TOSCAMP-BG1.2_S1

Automatic Content Analysis services: TOSCAMP-BG8_S1

4.2.7 Tagging Functionalities

This use case aggregation collects use cases pertaining the area of content tagging.

Semi-Automatic Semantic Annotation and Linking: TOSCAMP-BG9_S1
Automatic Annotation: TOSCAMP-BG8_S1
Matching with News Stories: TOSCAMP-BG4_S1
Enhanced Content Features: TOSCAMP-BG5_S1
Punctual Tagging: TOSCAMP-BG5_S1
Person recognition: TOSCAMP-BG1.1_S1
Face Detection: TOSCAMP-BG5_S1

4.2.8 Data Mining Functionalities

This use case aggregation collects use cases pertaining the area of data mining, i.e. the fundamental techniques that the system will have to support in order to achieve the automated metadata generation processes.

Create Aggregates / Clustering: TOSCAMP-BG3_S1
Update Aggregates / Clustering: TOSCAMP-BG3_S1
Shot Clustering: TOSCAMP-BG2_S2, TOSCAMP-BG5_S1
Threads Ranking Operations: TOSCAMP-BG3_S1
Automatic summarisation: TOSCAMP-BG8_S1

4.2.9 Event Detection and Classification

This use case aggregation collects use cases pertaining the area of event management, i.e. detection, classification of content-related events.

Automatic Events Extraction: TOSCAMP-BG8_S1
Automatic Event Alerting: TOSCAMP-BG5_S1
Event Classifier: TOSCAMP-BG4_S1
Detect interviews: TOSCAMP-BG8_S1

4.2.10 Personalisation Functionalities

This use case aggregation collects use cases pertaining the area of personalisation, i.e. the functionalities that the system will have to implement in order to achieve flexible adaptation to users.

Operations on User Profile: TOSCAMP-BG4_S1
Personalised News Creation: TOSCAMP-BG4_S1
Update Profile: TOSCAMP-BG4_S1
Login to personal account: TOSCAMP-BG7_S1
Recommendations TOSCAMP-BG9_S2

4.2.11 Synoptic View of Use Case Clusters

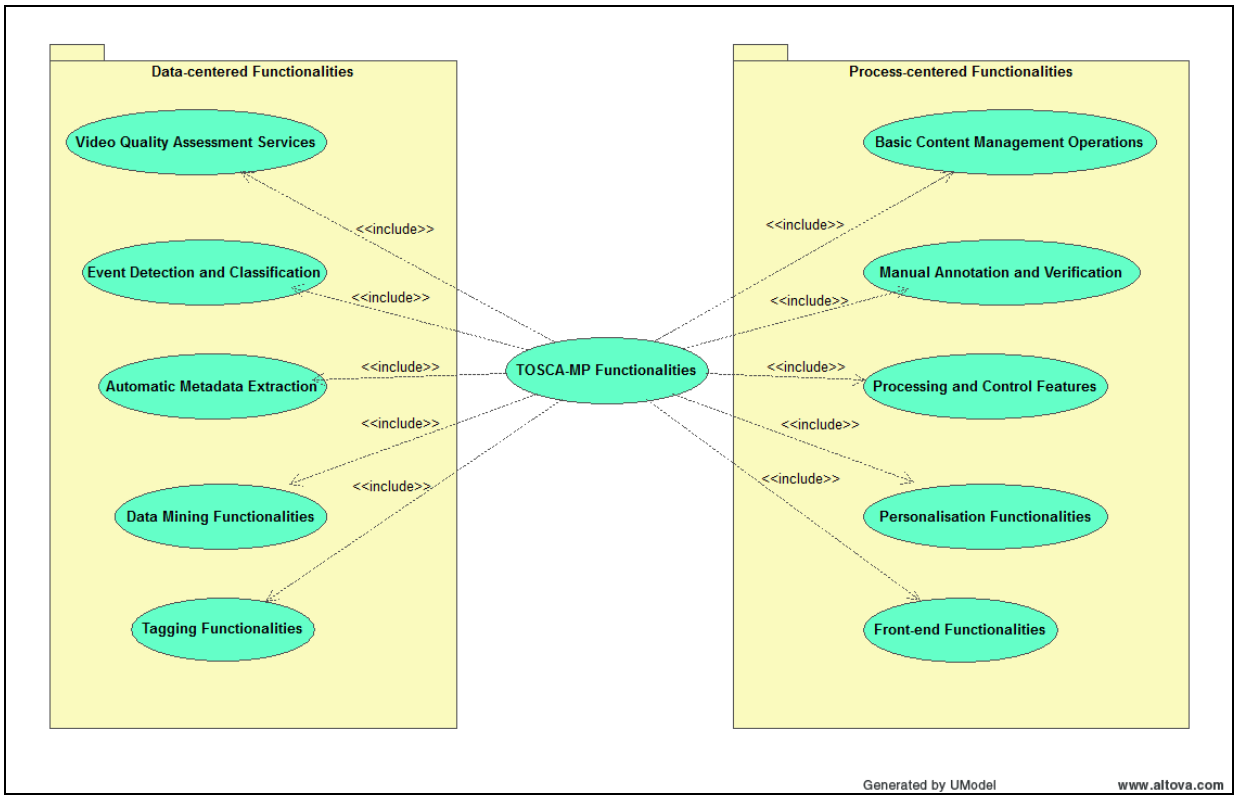

Figure 19. TOSCA-MP Functional Clusters

5 Conclusions

This deliverable collects, in a reasoned form, a set of usage scenarios presented in a two level hierarchical structure, as suggested by [Di Nitto, 2010], and as inspired by a consolidated approach in software engineering.

The approach underlying the work started from widening the perspective already set in the Annex I – part B – Description of Work of the project in the two reference scenarios recalled by Figure 1 and Figure 2 of this document, and consequently identifying a consistent set of atomic high-level functionalities that the users of the system expect to get accomplished by it.

As described in Section 4.1, the identified usage scenarios well represent the requirements of usage of broadcasters due to the relevant representation of these users in the consortium and in the authorship of this deliverable. The analysis conducted on the resulting set allow to state that the TOSCA-MP project plans for advancements (in terms of research, functionality or development) in key research areas matches positively with the users' expectations and needs. Furthermore, the key required functionalities across all scenarios can be clustered into 10 families of functional requirements for the system, as reported in Section 4.2. This aspect will considerably help the architecture design work and the subsequent development.

The work accomplished by this deliverable is a primary input for the development of Deliverable "Overall architecture, interfaces and protocols of the Distributed Repository Framework" and "Requirements" due respectively at M12 and M8 of the project.

6 References

[Jackson, 1995] M. Jackson, “Software requirements & specifications: a lexicon of practice, principles and prejudices”. New York, NY, USA: ACM Press/Addison-Wesley Publishing Co.,1995.

[Koehler, 2006] J. Koehler, R. Hauser, J. Küster, K. Ryndina, J. Vanhatalo, M. Wahler, “The Role of Visual Modeling and Model Transformations in Business-driven Development”, Fifth International Workshop on Graph Transformation and Visual Modeling Techniques (GT-VMT 2006).

[Liu, 2008] S. Liu, “Integrating top-down and scenario-based methods for constructing software specifications”, Third IEEE International Workshop on Automation of Software Test (AST 2008)

[Rosson, 2009] M.-B. Rosson, J. M. Carroll, “Scenario-based Design”, in J. A. Jacko (Ed.) “Human-Computer Interaction: Development Process”, CRC Press 2009.

[Di Nitto, 2010] E. Di Nitto, P. Plebani, “Describing Case Studies: the S-Cube approach”, Technical Report, Dipartimento di Elettronica ed Informazione Politecnico di Milano, 2010. Available at http://www.s-cube-network.eu/pdfs/EC-document-20100713.pdf .

[Kaindl, 2011] H. Kaindl, “Scenario-Based Requirements Engineering Facilitating Interaction Design”, INTERACT 2011, LNCS nr. 6949, pp 708-709, Springer.

7 Glossary

Terms used within the TOSCA-MP project, sorted alphabetically.

Business Goal	a condition or set of conditions which are to be met by the system from a mainly business process-orientated perspective
Usage Scenario	practical settings in which actors and systems interact to achieve a specific result in the context of one or more Business Goals

Partner Acronyms

DTO	Technicolor, DE
EBU	European Broadcasting Union, CH
FBK	Fondazione Bruno Kessler, FBK, IT
HHI	Heinrich Hertz Institut, Fraunhofer Gesellschaft zur Förderung der Angewandten Forschung e.V., DE
IRT	Institut für Rundfunktechnik GmbH, DE
K.U.Leuven	KatholiekeUniversiteit Leuven, BE
JRS	JOANNEUM RESEARCH Forschungsgesellschaft mbH, AT
PLY	Playence KG, AT
RAI	RAI - Radiotelevisione Italiana S.p.a., IT
VRT	De Vlaamse Radioen Televisieomroeporganisatie NV, BE

Acknowledgement: The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 287532.

