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Scenario's and breakdown analysis

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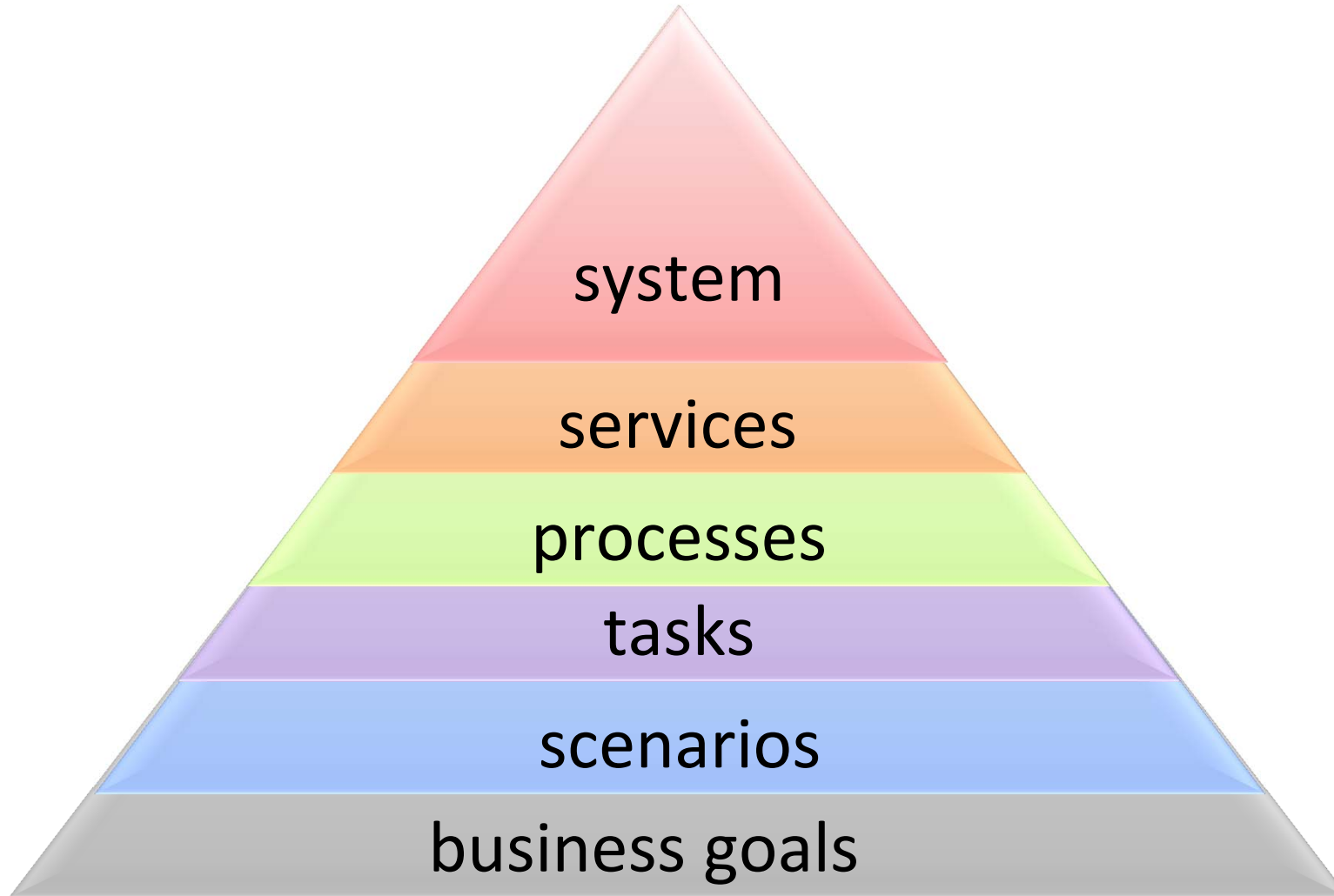
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Development steps



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Business Goals & Scenarios(1)



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- Methodology
 - We decided to use a structured approach at scenarios development
 - Partially adopted S-Cube methodology [1]
 - Business goals
 - Scenarios
 - We didn't go further into developing more specific use cases
 - Advantages
 - Better alignment with development cycles
 - Use of UML modelling drives towards harmonisation of scenarios descriptions
 - Disadvantages
 - More effort needed than plain textual descriptions
 - Functional breakdown of scenarios
 - Mapping w.r.t. advancements planned in research areas

[1] 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>

Example – structured business goals

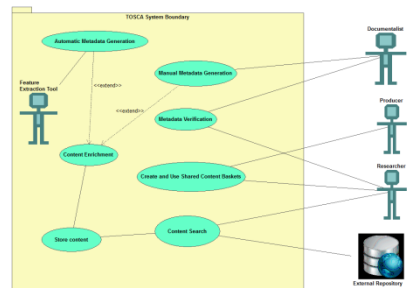
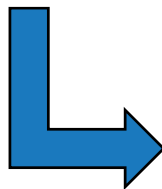


Field	Description
Unique ID	TOSCAMP-BG1.1
Short name	Fast retrieval of very recent material
Type	Business goal
Description	This business goal states that very recent material should be immediately retrievable. To accomplish this immediate disclosure of newly ingested material, making it available for 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.
Involved Stakeholder	Involved stakeholder
Priority of accomplishment	Must have



Field	Description
Unique ID	TOSCAMP-BG1.1_S1
Short name	Fast content disclosure for news production
Related to	
Involved actors	
Detailed operational description	
Problems and challenges	<ul style="list-style-type: none"> • (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

Field	Description
Unique ID	TOSCAMP-BG1.2
Short name	Efficient retrieval of historical material
Type	Business goal
Description	This business goal states that historical material should be efficiently retrievable. To accomplish this, a system (e.g. a very specific system) should be developed to allow the appearance of specific objects (e.g. a very specific object) in a production of entertainment material.
Rationale	In production of entertainment material, it is important to allow efficient retrieval of historical material, making it available for search immediately, is necessary.
Involved Stakeholder	Involved stakeholder
Priority of accomplishment	Must have



Business Goals & Scenarios(1)



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- Resulting Business Goals & Scenarios
 - 10 different business goals and a total number of 15 scenarios
 - We assigned priorities to Business Goals to drive the development of tools
- Analysis of BGs and outcome
 - 10 families of functional requirements identified, which have been passed on to architectural and system design
 - Automated Metadata Extraction
 - Basic Content Management Operations
 - Front-end functionalities
 - Manual Annotation and Verification
 - Video Quality Assessment
 - Processing and Control
 - Tagging
 - Data Mining
 - Event Detection & Classification
 - Personalisation
 - Analysis of relevant requirements w.r.t. planned research advancements



Research Areas vs. BGs and Scenarios

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Research area	Related objective	Advancements 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 a 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	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	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
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	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 levels of granularity	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
User interfaces for annotation	seamlessly use content from distributed heterogeneous repositories	collaborative annotation integration different sources of metadata,	MAYBE	MAYBE	Scenario 3 has a "refine and correct transcript" use case	NO	MAYBE Having no technology to recognize & cluster faces users have to do it.	MAYBE Specific automatic metadata extraction tool must be benchmarked in advance	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
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 broadcaster's metadata. This 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 0 MAYBE	5 YES 2 NO 0 MAYBE	6 YES 4 NO 0 MAYBE	7 YES 1 NO 0 MAYBE	9 YES 0 NO 4 MAYBE	5 YES 4 NO 0 MAYBE	65 YES 18 NO 16 MAYBE



List of BGs and scenarios



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- Fast retrieval of very recent material
 - Fast content disclosure for news production
- Efficient retrieval of historical archive material
 - Searching archived material, including deep archive
- Access to International Feeds and their Use in News Production
 - Distributed semantic search and retrieval of multilingual content
 - Dynamic configuration of features for content enrichment
 - Machine-supported subtitle generation
- News Daily Report with Event Detection and Impact Analysis
 - Assisted production of news stories using distributed multilingual sources

List of BGs and scenarios



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- Customised & Personalised Internet and Mobile Informative Services
 - Personalised News Stories service
- Multimodal Interfaces for Interactive / Augmented Reality Services
 - Enhanced Content Guide Service
- Efficient Video Quality Assessment of HD Material and of Archived Material
 - Highlights of a TV show for its 40 year celebration show
 - Providing material for Ultra-HD production
- Advanced Personalised Experience on Documentaries Creation
 - Life Documentary

List of BGs and scenarios



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- Assisted Production of Sports Events
 - Summary of downhill race
 - Summary of downhill world cup season
- Distributed repository for all steps in metadata production and usage chain.
 - Distributed content metadata production and post-production
 - Distributed search and recommendation

Requirements (1)



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- Methodology
 - Requirements analysis was based on Business Goals and Scenarios
 - Identification of Processes related to Scenarios
 - Each process described through a Process Description Sheet
- Analysis
 - Each Process was further analysed with use of UML Activity Diagrams and UML Sequence Diagrams when needed
 - Atomic requirements on architectural components have been derived during the process breakdown analysis and finally collected and harmonised
 - New components (e.g., GUIs) have been identified and characterised during the process analysis phase

Requirements (2)



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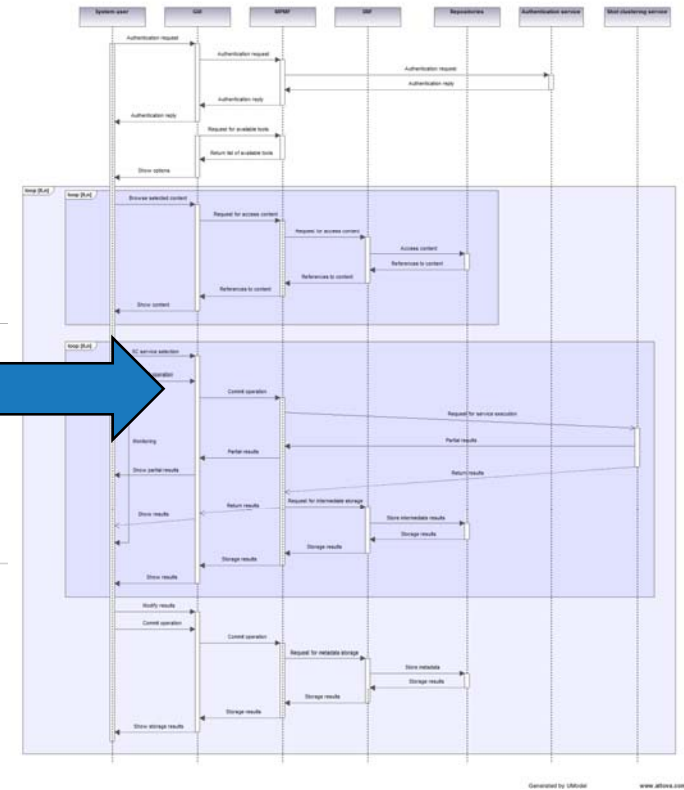
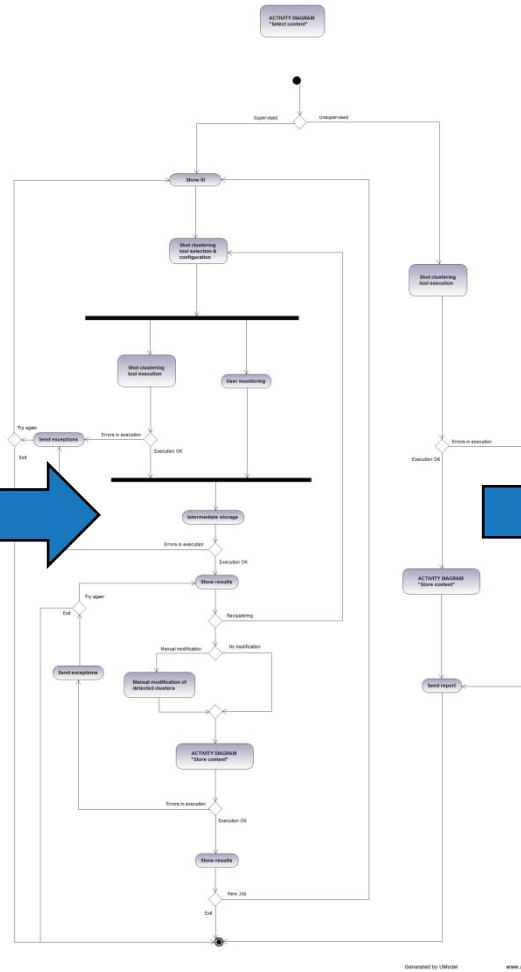
- Resulting Requirements
 - Requirements on MPMF
 - Requirements on DRF
 - Requirements on GUIs
 - Requirements on Distributed metadata repositories
 - Requirements on Distributed content repositories
 - Requirements on Services
- Further analysis
 - Identification of more abstract classes of processes from which more specific ones derive

Example



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TOSCA-MP Process Description Sheet			
Filled by	F. Negro	Organisation	RAI
Team		Date	13/04/2012
Contact - e-mail	f.negro@rai.it	Contact - phone	0039-011-8103229
Process name	Shot clustering	Current Version:	V01
Workpackage	2		
Scenarios	TOSCAMP-BG2_S2 (Dynamic configuration of features for content enrichment)		
Business goals Identifiers	TOSCAMP-BG2		
Process description	This functionality identifies clusters of similar visual shots		
Process activities and data flows	1-The shot clustering tool receives message from feed manager about which content has to be clustered 2- the shot clustering tool performs the shot clustering. This may include shot detection 3- a notification is sent back to the initiating actor 4- The system user can manually modify results 5- info about shot clustering are stored into the system		
Involved components	GUI for Shot clustering tool selection, MPMF, DRF, Distributed metadata repositories, Shot clustering service, Authentication service		
Initiating actor(s)	System users, System services, Manual workflow selection service, M...		
Inputs	Content		
Outputs	Metadata about found shot clusters (e.g., number and identification of shots for each cluster, information about clusters entropy)		
Status changing	The content gets updated with information about the found visual shot clusters		
Pre-conditions	The content must have a video track; a previous shot detection process may have already produced information about shots		
Post-conditions	The content is associated to data describing the found shot clusters		
Messages to the process	Content identification, location of the content instance on which to perform the shot clustering, exceptions; pushing message		
Messages from the process	Log about which operations have been done, exceptions, reference to extracted metadata; polling message		
Other specifications	any other specification about the process		
None			



Tasks - definitions



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- Task
 - A sequence of actions performed by one or more users to achieve a defined goal in the production process, possibly using a set of tools. The task has a defined set of input documents and produces a set of output documents. For example, a “Content Search Task” would be defined as “The action performed by a Broadcast Employee to find an audiovisual content item with a specified Title”.
- Task metamodel
 - Is the language to define and describe task models
- Task model
 - Is an abstract representation of a task, i.e. an orchestrated set of actions performed by Actors in order to reach a specific objective. The objective is expressed in terms of conditions that have to be satisfied by the reference domain. Pre- and Post-Conditions may pertain to single objects or sets of objects or to the entire domain. For example, assuming that the task metamodel is natural language, the “Content Search” task model would be defined as “The action performed by a user in order to find a Content Item having specified Metadata properties”

Collection of relevant Tasks



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- Relevant tasks in media production have been collected through an online survey
- Each resulting task has a standard description
 - Context
 - Description
 - Actors
 - Inputs and outputs
 - Frequency
 - Completion time
 - Success criteria

List of collected tasks



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- Identification and annotation persons in news material
- Annotation of topics of incoming news items
- Annotation of relevant places and objects in archive material
- Annotation of live sports content
- Performing quality analysis of a/v material
- Search for specific content items in repositories of different content providers
- Search for multilingual news material
- Gathering material for use in a documentation
- Editing by a geographically distributed team

List of collected tasks (cont'd)



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- Creating summary about evolving news story
- Creating highlight summaries about sports events
- Generating subtitles for news
- Producing news content for personalised mobile services
- Assessing impact of a topic in broadcast and web
- Collecting and registering identification information for an asset
- High-level temporal segmentation
- Identification of (near) duplicates

Questionnaire Instructions



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- Read very carefully questions Q1 – Q6
 - They are related to each business goal, each scenario and each task
 - If possible try to remember the questions
- Respond to Q1-Q6 by marking your score (0-5) in the right columns
 - It can be helpful to keep the question sheet at hand when filling the table
- All questions have the same answering paradigm
 - 0 meaning “low rank”, 5 meaning “high rank”
- Q2 has also a substantive text space to add your free considerations
- The table has a colour code which is used as a border between business goals
 - Same colour == the scenario is in the same business goal
- Q7 – Q9 (not Q6 – Q8 !! It is a typing error) are general questions (not related to each or any particular bg/scenario/task)
- Use all the spare time during the day to fill the questionnaire, and give it back to us before leaving
 - Starting from now until next slot