CLARIAH WP5
Media studies/audio-visual data plan

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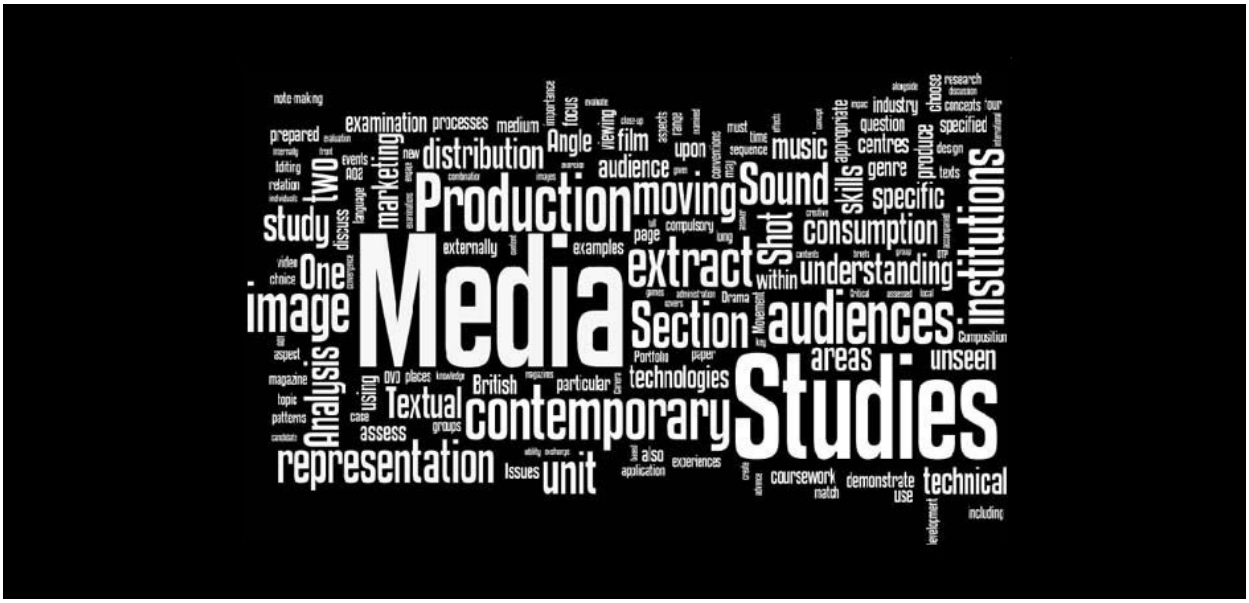

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1 Introduction

1.1 Background

The CLARIAH research infrastructure is intended to support the Humanities researchers with digital data and tools. The infrastructure must offer facilities for the workflow of a typical research project in which existing data or data generated by the researchers' is being used.

Media researchers usually work with existing datasets: audio-visual sources (film, radio and television programs, online audio and video), published sources (newspapers, TV guides, social media content) and structured data (such as TV audience ratings, or a database such as Cinema Context with data about films, cinemas, screenings, and, people and companies active in the film sector taken from newspapers and archivalia[1]).

Due to the specific nature of the material – a combination of images and sounds, time-based - additional measures are necessary to render audio-visual sources available and searchable on a larger scale. Partly this is achieved by linking the sources to descriptions including their content and a number of contextual details (metadata, subtitle files) and, partly with the aid of new technologies, such as speech recognition for automatic generation of transcripts and image recognition for finding patterns in visual characteristics.

Recent user studies (Bron et al. 2013; Bron et al. 2015) have shown that media researchers want to study the various sources in relation to each other. A good understanding of audio-visual sources entails detailed knowledge of context in which they were produced, circulated and viewed. Researchers working with audio-visual sources are often also interested in the role of the media in the construction, circulation and reception of a specific social or cultural phenomenon. This requires that the various perspectives of the same phenomenon can be traced through time and be analysed in relation to each other. Besides, the research process for media researchers is characterized by an *explorative phase* on the content of the material (in which the research question is developed and/or fine-tuned) followed by a more focussed collection and analysis of, mainly, contextual data (*contextualisation phase*) – a cycle that is often repeated once or several times and is rounded off with presentation of the results (*presentation phase*) (Bron et al. 2015).

The greatest challenge for media researchers is gaining access to the source material as this is frequently protected by copyrights, and, spread over various repositories. There is also demand for instruments to enable the study of the various source materials in relation to each other. During recent years tools answering this need have been developed in the context of NWO CATCH, CLARIN-NL and CLARIAH-Seed. At the moment these tools are only available as prototypes, are in various stages of development and are not all yet available for many groups of researchers. The proposed agenda, for media studies/audio-visual data in CLARIAH, is aimed at further development and making available of the tools, as well as at training researchers to use them. The agenda is initially targeted at researchers within the media studies but also addresses researchers in other research fields within the humanities and social sciences where audio-visual sources are used.

1.2 Goal

The agenda for media studies/audio-visual data aims to consolidate five existing tools for explorative and focussed, contextual media scientific research. The tools will be further developed and made available, initially for researchers in media studies but spreading to all disciplines who want to use audio-visual sources in research on specific historical themes or events. On top of this we have formulated an umbrella project (Media Studies Suite) that will serve to resolve any overlap in functionality between tools by combining tools and integrating new, state of the art functionality into these synthetized tools. These are the tools in question:

[1] www.cinemacontext.nl

CoMeRDa[2]	Aggregated search interface: explorative research in different collections (descriptions of television programs, photos, Netherlands Institute for Sound and Vision Wiki, TV and Radio guides, newspapers); visual representation of the sources.
AVResearcherXL[3]	Explore radio and television program descriptions, television subtitles and general newspaper articles. Facilitates comparative analysis of television programs and newspaper articles via visualisations in the form of word clouds and timelines.
TROVe[4]	Multimedia search engine facilitates research into the dissemination of news via radio and television, Twitter, online newspapers and blogs; lends insight into the development of public debates through time and via various media (identification of the most important topics, players and impact via word clouds, line and scatter graphs and audience ratings, direct access to the actual items).
DIVE[5]	Presentation of collection-items in context (links to relevant contextual online information), facilitates intuitive browsing to 'dive' deeper into the content.
Verteld Verleden[6]	Explorative and focussed search in audio-visual narrative interview collections.
Media Studies Suite	Integration of tools with overlapping functionality (CLARIAH Core). Extended with sentiment analysis and prediction analytics of subjective aspects (via externally financed research project).

The agenda aims to realise the following goals:

- Establish a durable management, development and production environment at the Netherlands Institute for Sound and Vision (B&G) to accommodate the tools listed above
- Consolidation of the tools (stability, good functionality)
- Further development of the tools (logging and scale-up to greater number of users; extra data & functionalities: *data and tool curation*)
- Anchoring the consolidation, development and continuing development in user scenarios through user studies and *Research Pilots*
- Trace and resolve overlap in functionality (via umbrella project Media Studies Suite and on the basis of the results of *Research Pilots*)
- Develop new generation tool (on the basis of existing tool(s), *with additional means*)

As the tools listed above have as yet not been widely used, we want to test them in a number of 'ear marked' Research Pilots with various user groups within the Humanities. On top of that, the open Research Pilots will also provide the opportunity to adapt the tools for other data and functionalities.

1.3 Scope

What exactly are we going to deliver?

[2] Due to copyright restrictions, CoMeRDa can, at this moment in time, only be consulted on the premises of the Netherlands Institute for Sound and Vision. For a description see: http://vps46235.public.cloudvps.com/bridge/tools/the-comerda-tool/.

[3] http://avresearcher.clariah.beeldengeluid.nl/; username: j.vangorp@uu.nl, password: AVResearcherXL. Previously known as QuaMeRDES/MeRDES, like CoMeRDa, this is a tool from the NWO CATCH project BRIDGE, http://ilps.science.uva.nl/node/735. QuaMeRDES has been further developed with CLARIN-NL and CLARIAH-Seed money to produce AVResearcherXL.

[4] http://trove.beeldengeluid.nl/; username: trove, password: beg_evort. CLARIAH Seed project.

[5] http://dive.frontwise.com/. About the project: http://dhcommons.org/projects/dive-dynamically-linking-collections- basis-events. Previously known as AGORA, NWO CATCH project.

[6] http://www.verteldverleden.org/. Previously known as Oral History Today (OHT), CLARIAH Seed project

We will deliver a **set of tools** for the search, analysis and visualisation of audio-visual collections and contextual data. The tools will be tuned to the methodologies of (media studies) researchers and to the requirements of the specific collections (such as copyright and privacy). This set of tools will be modelled, partly, to the phases of the (media studies) research process and, partly, to the functionality in relation to specific types of collections. This is visualised in the diagram below:

Functionality and collection / Research phase	Search audio-visual collections in relation to published sources	Exploration of audio-visual collections via relevant online information	Analysis of the dissemination of news across various media sources	Search and annotation of narrative interview collections
Exploration	CoMeRDa	DIVE		Verteld Verleden
Contextualisation	AVResearcherXL		TROVe	
Presentation[7]				

A sixth, new generation tool (Media Studies Suite), will be developed on the basis of an analysis of the use of these five tools to resolve any possible overlap in the functionality of any two or more of the tools. On top of that, we will enhance the new tool with functionalities to support content analysis of the sources, for instance sentiment analysis and the integration of predictive analytics with respect to subjective aspects. In 2015/16 we will submit a request for a grant for fundamental research in the NWO (third round Creative Industry, Open Competition) for the integration of this *state-of-the-art* technology.

A production environment for the implementation and hosting of the tools as well as the curation of audio-visual and contextual data will be set up at the Netherlands Institute for Sound and Vision (B&G). This will include an online portal where users can gain information about the use of the tools, data conversion, licenses, and so on. A distributed development environment will also be created for the developers of the analysis environment that will be utilised.

The five existing CLARIAH media studies tools consist of two sections:

1. A generic analysis environment
2. Additional data and interfaces

Ad 1: The generic analysis environments will be managed by the research groups that have developed them:

xTAS	UvA Computer Science
ClioPatria semantic search	VU Computer Science
SHoUT	UT Computer Science

To this end the B&G will hire backend managers who will work part-time at the research groups in

[7] At the moment the five tools do not offer any possibility of exporting the results generated for use in publications. The addition of this functionality is part of the CLARIAH Core Media studies agenda.

question on the maintenance of the analysis environment.

Ad 2: The existing tools were built on the B&G collections (broadcast material, photos, program descriptions, TV and Radio Guides) and contextual data from other collections (digital newspapers, online information), all in the Dutch language domain. This means that, after implementation, these tools (see section 2, Projects, tasks and budget) will be mainly suitable for research into news related events and processes of opinion forming as they occur via the Dutch language media. This makes them interesting for a wide range of researchers in the Humanities (media researchers, historians, art historians, literature researchers, cultural studies researchers) and social scientists (communication scholars, sociologists, political scientists, anthropologists)[8]. The tools are also suitable for use with other collections, such as international collections of radio and television material, newspapers, Wiki's and blogs, and also collections of films and online videos (YouTube, Vimeo). The production environment at B&G provides support for the implementation of new data in de existing tools[9].

The following tasks are not part of the project:

- The most basic levels of preparation of collections for implementation in the tools (B&G will give advice on standards but cannot actually carry out all of the conversions);
- Building new datasets;
- Linking the data across all sections of CLARIAH (see WP2).

1.4 Expectations

We expect that, initially, it will be mostly media studies researchers that will work with the data and tools available in CLARIAH. We also expect that researchers will want to use their own data in the CLARIAH media studies tools. Finally, we expect that researchers will want to combine *exports* of results from the media studies tools (for use in analyses and presentation) with the textual or structured data available in CLARIAH, or, that they will want to input it into other tools available in CLARIAH, for example, for text analysis or visualisation.

1.5 Preconditions

Setting up a durable management, development and production environment at B&G is a prerequisite for being able to realise this agenda. Most of the available resources will have to be reserved for this because B&G, unlike most of the other data centres in CLARIAH, is not yet a certified data centre and does not yet have all of the necessary facilities.

1.6 Relations with other projects

1. CLARIAH Core WP2: link up to the central infrastructure (authentication and authorization), coupling with the other data collections there via linked open data representations.
2. CLARIAH Core WP3 en 4: Participation in two projects that transcend domains:
    a. Development tool for automatic extraction of structured data from text (based on the data about cinemas, films, and screenings in the film ladders of the newspaper collection at KB National Library of the Netherlands)
    b. Athena project: collect historical data about the relationship between man and nature
3. CATCH valorisation project: adding TV guides to CoMeRDa
4. Collaboration will be sought with Nederlab for the addition of subtitle files to AVResearcherXL

[8] After the addition of the planned data export functionalities, the tools will provide access to collections of spoken language relevant to, for example, linguists and psychologists. In many cases these collections will include transcripts.

[9] *Verteld verleden* (Oral History Today) already includes not only interviews from the B&G collection but also collections from diverse other Dutch archives and is specifically focussed on one type of source: the narrative interview, used by several groups of researchers in the Humanities and Social Sciences.

(task 2.2.10.3, see section 2, Projects).

1.7 Link to DARIAH-EU

For the field of Media studies/audio-visual sources, it is most obvious to link up to the DARIAH-EU ERIC. At the moment the DARIAH-NL agenda is still being developed. After consultation with Peter Doorn we will plan a meeting of everyone involved to decide how the link can best be achieved. We expect to contribute mainly to activities to do with education and training. Within CLARIAH Core Media studies, Stef Scagliola will act as DARIAH-NL liaison as she is already active in DARIAH- NL.

1.8 Dissemination

In view of the fact that the five selected tools are not yet available for wide groups of researchers and students, we will organise various activities to promote them and their use in research. These activities will include presentations, workshops and guest lectures. The user studies that have already been planned (see section 2, project 5) offer not only input for the further development of the tools, but also dissemination opportunities. For these activities we are going to work closely with the advisory board that will represent the potential users from Media studies (see section 3, Organization), and also with the most relevant research schools (amongst others, Research School for Media Studies, Huizinga Research Institute for Cultural History). The agenda for these activities will be arranged between the dissemination liaison (see section 3, Organization) and the dissemination coordinators in WP1.

2 Projects and tasks

The objectives described above will be realised in five projects:

Project		Project leader
1	Support/production/development environment B&G (Netherlands Institute for Sound and Vision)	Johan Oomen (B&G)
2	CoMeRDa AVResearcherXL TROVe	Maarten de Rijke (UvA-CS) Jasmijn van Gorp (UU-GW)
3	DIVE	Lora Aroyo/Victor de Boer (VU- CS) Chiel van den Akker (VU-GW)
4	Verteld Verleden (Oral History Today)	Roeland Ordelman (UT-EWI) Stef Scagliola (UvA-GW)
5	Media Studies Suite	Thomas Poell (UvA-GW) t.b.d. (postdoc 0,7; UvA-GW)

Each project will be described in more detail below. This will include an indication of priority for each task: *must have* (I) and *nice to have* (II).

2.1 PROJECT 1. SUPPORT, PRODUCTION AND DEVELOPMENT ENVIRONMENT

In order to fulfil its role as data centre in CLARIAH, B&G must set up a support, production and development environment. This entails the following aspects:

1.10	Back-end management (the manager will be employed part-time by the university where the tools have been) (I)
1.20	Data management (technical, format, standards, conversions) (I)
1.30	Data management (content – selections) (I)
1.40	Dedication of development capacity (I) for the benefit of

	• Setting up test, acceptance and production environment; • Making CLARIN infrastructure compatible (B&G still needs to certification); • Installing of (language) analysis tools in production environment; • Installing and setting up search engines and import of the various data (via importers). Optimization of this environment; • Developing technical interfaces (between data sources, and with the results of WP2); • Setting up and maintaining a link with Academia; • First line support for the search environment and supervision if this is realised by a third party.
1.50	Hardware and processing (I)
1.60	Monitoring sustainability of the tools and management/supervision if this is realised by a third party (I)
1.70	Purchasing the licences (where possible, right across CLARIAH) (I)
1.80	Hosted service for text analysis based on the xTAS suite[10] in collaboration with 904Labs[11] (I)

2.2 PROJECT 2. TOOLS FOR SIMULTANEOUS SEARCHING IN A-V AND PUBLISHED SOURCES

2.1 CoMeRDa

This tool is almost fully developed and ready for use. At the moment, new volumes of TV guides are being added within the CATCH valorisation project and the copyrights are being obtained. The following issues will be addressed within CLARIAH Core:

2.1.10	Necessary measures (I)
2.1.10.1	Write a user manual
2.1.10.2	Live link with iMMix and B&G Wiki
2.1.10.3	Obtain rights for photo and newspaper collections
2.1.10.4	Addition of the National Library of the Netherlands' newspaper collection with live link
2.1.10.5	Link-up to Europeana
2.1.10.6	Addition of data export functionality
2.1.10.7	Addition of ILPS-logging
2.1.20	Improve the searchability of the photo collection (metadata) (I)

2.2 AVResearcherXL

This tool has been tested with various users (amongst others, media researchers, journalists). This aided the generation of a list of necessary measures. There is also evidence of a wide demand for a representation of missing information, to enable a good interpretation of the results that are found and to increase the transparency. This tool would profit from an advanced text-mining tool. New collections will also be added (extra newspapers and a radio collection).

2.2.10	Necessary measures (I)
2.2.10.1	Automatic updates of the data via live link with iMMix and the National Library of the Netherlands
2.2.10.2	Link with the streaming videos in Academia.nl
2.2.10.3	Addition of subtitles for searchability

[10] http://xtas.net/

[11] http://904labs.com/

2.2.10.4	Representation of sources
2.2.10.5	Addition of data export functionality
2.2.10.6	Addition of ILPS-logging
2.2.20	Representation of missing information (I)
2.2.30	Advanced text-mining (iMMix and newspapers) (II)
2.2.40	Addition of new collections (II)

2.3 TROVe

TROVe is a very promising tool for which there is great demand. At the moment, however, it is also the least developed of the tools. The most urgent tasks are to stabilise the tool (sustain liveness) and to improve the performance, the addition of a live link with iMMix, the addition of ILPS-logging and supplementing the missing with data and addition of new collections, such as the National Library of the Netherlands' newspaper collection, radio programs, etc. (so that TROVe can not only be used for current material but is also suitable for the analysis of more historical public debates). As well as this, use within CLARIAH also necessitates the procurement of rights for the tweets, blogs, newspapers and SKO[12] ratings included in the tool. The implementation of a machine learning system in which search terms are used to crawl the data, or where search terms are suggested by the system is highly desirable. Finally, data export functionality needs to be built in and it needs to be useable with existing visualisation tools and publication formats.

2.3.10	Necessary measures (I)
2.3.10.1	Monitor system back-end / system to support *liveness*
2.3.10.2	Redesign normalisation timeline front-end
2.3.10.3	Redesign facets front-end (including separate apart subtitle field)
2.3.10.4	Include functionality for quantifying "reach" of the content via ratings, number of retweets, number of followers, etc.
2.3.10.5	Live link with iMMix
2.3.10.6	Fix rights for tweets
2.3.10.7	Fix rights for blogs
2.3.10.8	Fix rights for newspapers
2.3.10.9	Fix rights for SKO ratings
2.3.10.10	Include extra volumes of ratings (850 euro/volume)
2.3.10.11	Include missing data (Nov. 2013 - Jan. 2014 missing due to problems with server)
2.3.10.12	Include data export functionality (I)
2.3.10.13	Include ILPS-logging (I)
2.3.20	Machine learning system (II)
2.3.30	Addition of collections (I)
2.3.40	Addition of TV and radio ratings data (I)

[12] https://kijkonderzoek.nl/

PROJECT 3.
DIVE

This tool is available in a test version. In order to make it suitable for explorative research into the context of specific *events,* the following requirements need to be met:

3.10	Necessary measures (I)
3.10.1	Implementation of event narratives in the front end
3.10.2	Links to internal (GTAA) and external vocabularies (DBpedia, AAT, ULAN, Geonames)
3.10.3	Links to collections (Europeana, Open Cultuur Data)
3.10.4	Integration of original description of each object
3.10.5	Addition of ILPS-logging

As well as these necessary measures, the infrastructure will be scaled up by creating an API for access to the enriched data, integrating login functionalities and importing a module.

3.20	Scale up (I)
3.20.1	API for access to the enriched data
3.20.2	Add login functionality and import module

PROJECT 4.
VERTELD VERLEDEN (ORAL HISTORY TODAY)

This tool is available and works on the collections that are already included. Within CLARIAH Core we are working on a generic ingest workflow of metadata with special attention to feed and storage of time-coded annotations (manual, aligned, automatic).

An infrastructure for processing audio data will also be set up via the central audio analysis service (speech recognition, emotion recognition, etc.). Researchers will be able to present collections to this service and these will then be provided with die transcripts[13].

4.10	Generic ingest of metadata (I)
4.20	Audio-analysis service (I)
4.30	Semi-automatic transcript service (II)
4.40	Addition of ILPS-logging (I)

2.3 PROJECT 5.
MEDIA STUDIES SUITE

Existing tools have been (further) developed in various, successive projects and they nearly all use the B&G and National Library of the Netherlands' collections and data. In this fifth, umbrella project the overlap in functionality will be mapped. The result will be a typology of the phases in humanities research (explorative, analytical, etc.) to which the tools will be linked. A strategy will be devised, based on user studies, for integration of tools with overlapping functionalities (for example, AVResearcherXL and TROVe).

Further development of the integrated tool is also envisaged by integrating new, state-of-the-art search technology such as analysis of subjective aspects of information (sentiment analysis, framing). Extra,

[13] At the moment, this service is set up as part of the B&G speech recognition infrastructure that is linked to external suppliers. This infrastructure will be expanded so that audio-analysis tools from other parties (other suppliers, from collaborations with academic partners) can be linked.

external funding will be sought for this (see section 1, Introduction).

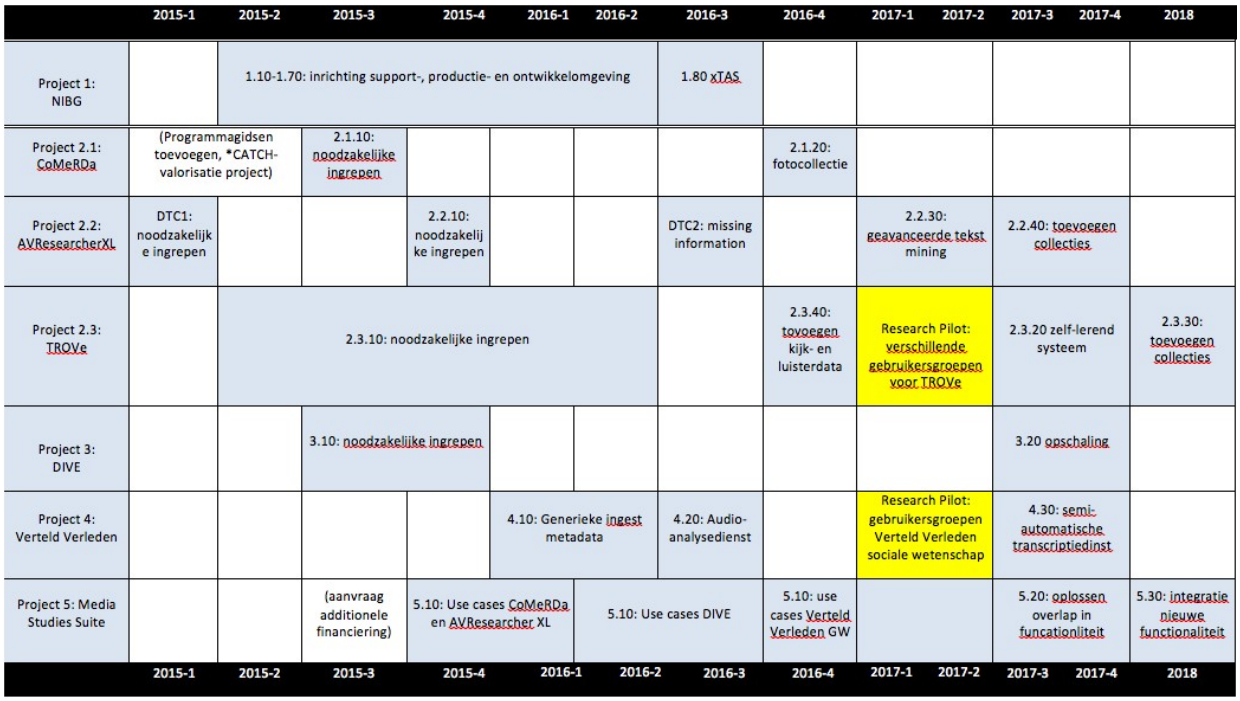
5.10	User studies (typology phases research; defining *user requirements* per phase of the research and functionality/type of collection) (I)
5.20	Combining tools with overlapping functionality (I)
5.30	Integration of new functionalities (II)
5.30.1	Cross-modal search
5.30.2	Support multi-session search and research trajectories
5.30.3	Support collaborative search

The user studies are based on two different types of project:

a. User studies set up by the postdoc in which the existing tools will be tested with data brought in by the users (data and tool curation projects as foreseen in project 1);

b. One or more of the Research Pilots that will be carried out in 2017.

3 Planning



4 Organisation

The project described above include tasks in the following fields:

- Infrastructure
- Data curation
- Tool curation

The plan for audio-visual data and media studies is based on the stabilisation, synthetization and further development of existing tools. That is why the data and tool curation are spread over five separate projects, where:

- project 1 involves the curation of new data;
- project 2-4 involve the curation of existing tools and data;
- project 5 is an umbrella project intended to ensure that the users are central in the further development and that nothing is done twice.

The data and tool curation projects above will be carried out by interdisciplinary teams, consisting of:

- Humanities researcher
- Computer science researcher
- Programmer(s)/software engineer(s)
- Data provider

In projects 2-4 the data and tool curation will be carried out under the supervision of the researchers who were involved in the development of respective tools. All of the projects will be driven by the research requirements and practices of Humanities researchers.

This results in the following division of tasks:

4.1 Track leader

Julia Noordegraaf (0.2 FTE; Universiteit van Amsterdam-GW)

4.2 Project leaders

Project 1:	Johan Oomen (see section Technical coordinator)
Project 2:	Maarten de Rijke (0.1 FTE; University of Amsterdam, Faculty of Science) and Jasmijn van Gorp (0.2 FTE; Utrecht University, Humanities)
Project 3:	Lora Aroyo/Victor de Boer (0.1; VU University, Faculty of Sciences) and Chiel van de Akker (0.1 FTE; VU University, Humanities)
Project 4:	Stef Scagliola (0.05 FTE; University of Amsterdam, Humanities), also DARIAH- liaison (content)
Project 5:	Thomas Poell (0.1 FTE; University of Amsterdam, Humanities) and postdoc (t.b.a.) (0.7 FTE; University of Amsterdam, Humanities), also dissemination-liaison WP1

4.3 Technical coordinator

Johan Oomen (0.2 FTE; B&G)	
	To link the various media studies projects
	To link WP5 to the other work packages, especially WP2
	To link WP5 with DARIAH-EU (technical)
	To represent data centre B&G in technical meetings chaired by CTO Gertjan Filarski

4.4 Software engineers and data managers

Project 1:	Developer (1.0 FTE; B&G) Backend manager (0.7 FTE; B&G) Data manager (content) (1.0 FTE; B&G) Data manager (technical) (0.5 FTE in WP2; B&G)
Project 2:	t.b.a.
Project 3:	t.b.a.
Project 4:	t.b.a.
Project 5:	t.b.a.

4.5 Organisation structure

To ensure that the agenda above will be realised, we will maintain the following organisation structure:

CLARIAH Core Media studies Core team

Role and tasks	prepare strategy and policy, direct execution
Meetings	meetings once a fortnight (1x per month with project team, 1x per month informal)
People involved	• Julia Noordegraaf (track leader, chair) • Maarten de Rijke (representing Technical Advice Panel) • Johan Oomen (technical coordinator, liaison WP2) • Jasmijn van Gorp (liaison user studies WP2) • Thomas Poell (liaison dissemination WP1)

CLARIAH Core Media studies Project team

Role and tasks	execution of project, monitor progress
Meetings	once a month
People involved	

CLARIAH Core Media studies Advisory Board

Role and tasks	advise on strategy and policy from the point of view of the envisaged users
Meetings	2 or 3 times a year
People involved	still to be invited- researchers within Media studies who can represent their colleagues (EUR, RUG, RUN, UM, UU, UvA, VU).

5 Budget

See attachment 'CC WP5 budget 16 March 2015'.

The budget reflects the tasks as defined under section 2 and the coordination of those tasks as defined under section 3. The most recent NWO salary tables available at the time were used ("*Berekening vergoeding met salarispeil 1 juli 2014*"[14]). A request will be made to NWO to allow us to declare the actual salary costs for the developer (1.40 - still to be hired) as the specific expertise called for to realise this facility is not available for the standard salary.

[14] http://www.nwo.nl/financiering/hoe-werkt-dat/Salaristabellen

6 References

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