



LINKEDTV



Deliverable 6.4 Scenario Demonstrators (v2)

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¹

- PU = Public
- PP = Restricted to other programme participants (including the Commission Services)
- RE = Restricted to a group specified by the consortium (including the Commission Services)
- CO = Confidential, only for members of the consortium (including the Commission Services)

	<p><i>during the programme to related information and content from the Internet. They also validate the maturity of the LinkedTV technologies which were used to implement the scenario demonstrators.</i></p>
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1 LinkedTV Scenario Demonstrators, version 2

This deliverable presents the updated realisation of the LinkedTV scenarios, based upon the first scenarios described in the deliverable D6.2 Scenario Demonstrators (v1).

Since the initial realisation of the scenarios for our broadcaster partners - which was based on first user trials (using interviews and mockups of the planned scenario applications) and implemented on top of the first implementations of LinkedTV services for media analysis, annotation, enrichment and delivery via a client application -, we have been able to

- (1) refine our understanding of the broadcasters' viewers' interests and preferences regarding LinkedTV enrichment services by being able to validate the first scenario implementations with them in a number of observed user trials;
- (2) guide the subsequent iterations of research and development into LinkedTV media analysis, annotation, enrichment and delivery via a client player and UI to more closely address the specific requirements of the scenarios and their viewers.

This means we are able to provide now two distinct LinkedTV applications, each of which is implemented specifically for its stakeholder (our collaborating European broadcasters), their TV programme and most importantly, their viewers. We will describe the requirements we derived for LinkedTV implementation based on trials with TV programme viewers, how these led to refinements of our scenario descriptions, the new functionalities we requested and received from the LinkedTV technical implementations and the outcome in the form of distinct LinkedTV applications:

- (1) LinkedNews, the LinkedTV application for regional news viewers, in German for viewers of the Abendschau from Rundfunk Berlin Brandenburg (RBB);
- (2) LinkedCulture, the LinkedTV application for cultural heritage programming, in Dutch for the show Tussen Kunst & Kitsch (TKK) from AVRO (in collaboration with LinkedTV partner Sound and Vision).

These new applications could already be shown live at industry events: at IFA 2014 in Berlin (LinkedNews) as well as at IBC 2014 in Amsterdam (both). Videos of the LinkedTV applications are provided via the LinkedTV Social Web channels and website for dissemination and exploitation activities.

Furthermore, we continued our work with media artists on additional LinkedTV media art scenarios, in which we have the opportunity to explore the application of LinkedTV functionality and services outside of the "classical" TV viewing experience. Three media art scenarios have been developed further, with the use of multisensory surfaces, immersive screens and personalised social video giving us a chance to explore Linked Television in quite different, future-facing set-ups.

Section 2 begins with the updated scenario around the Cultural Heritage documentary, now known as "LinkedCulture".

Section 3 provides an update on the News scenario, now known as “LinkedNews”.

Section 4 provides an update on the media arts scenarios.

Section 5 concludes this deliverable with our plans for the remaining time in the LinkedTV project to evaluate these updated LinkedTV scenarios and validate their added value with our broadcaster stakeholders.

1.1 History of the document

Date	Version	Name	Comment
9 July 2014	V0.0	Lyndon Nixon	Draft document created using proposed ToC
13 July 2014	V0.1	Lotte Baltussen	First Sound and Vision inputs
1 August 2014	V0.2	Stephane Dupont	First U MONS inputs
5 August 2014	V0.3	Lotte Baltussen	Added Sound and Vision scenario description with personas and storyboards
8 August 2014	V0.4	Fabien Grisard	Updated Social Documentary section
21 August 2014	V0.5	Nico Patz	RBB contributions added
27 August 2014	V0.6	Lyndon Nixon	Added introduction, revised sections 2-4, included technical implementation diagrams and explanation
3 Sep 2014	V0.65	Lotte Baltussen	Addressed TKK comments
15 Sep 2014	V0.8	Nico Patz, Fabien Grisard, Lyndon Nixon	Revising all content so far,
22 Sep 2014	V0.9	Lotte Baltussen, Fabien Grisard, Lyndon Nixon	Completing sections.
24 Sep 2014	V0.95	Lotte Baltussen, Nico Patz, Lyndon Nixon	Finalisation of Sections 2 and 3.
26 Sep 2014	V1.0	Lyndon Nixon	Cleaned up document for QA

Table 1: History of the document

1.2 Glossary for the document

Concept	An entity; a notion of some person, place or other thing that may be perceived in the TV programme.
Dimension	Since the total list of relevant links to online content that form an enrichment could be organised in many different ways into differing, distinct subsets of links, we can organise those links according to a common characteristic into different dimensions. Dimensions can be links from a shared source (website or white list), links to content of the same media type, links to content dated in the same date range, links to content geolocated to the same location etc.
Enrichment	Additional content around a specific concept - or a specific segment of the TV programme associated to a number of concepts - which is provided to a viewer through a LinkedTV application.
Information Card	For concepts of a particular type, a set of properties can be determined which are representative of that type and relevant to a user interested in that concept, e.g. birthplace (persons) or artist (painting). An information card displays the values of a set of representative properties for a concept according to its type.

2 “Linked Culture” – the Tussen Kunst & Kitsch scenario

The scenario led by our partner Sound and Vision collaborates with the Dutch public broadcaster AVRO to enrich their TV programme Tussen Kunst & Kitsch (in format similar to the BBC’s “Antiques Roadshow”). More background to this scenario can be found in LinkedTV D6.2 Scenario Demonstrators (v1). Public content associated with this scenario is online at <http://www.linkedtv.eu/demos/hyperlinkeddocu>.

2.1 Lessons learnt from user trials²

There were seven important lessons learnt that came to the fore in the 2014 TKK user trials regarding the information needs of Tussen Kunst & Kitsch (henceforth: TKK) viewers for an “Linked Culture” application:

- **Information overload danger:** the participants considered the number of concepts shown per chapter (around 12), divided over WHO, WHAT and WHERE layers too much. They suggested showing only a few concepts per chapter, and not grouping them into concept categories. Furthermore, TKK users prefer rather to see much less information during the show and more afterwards
- **“Where” < “Who” and “What”:** Although participants suggested to lose the high-level concept categories, they did indicate that they are mostly interested in information related to persons and topics, but not so much the geographical information related to these persons and topics. That being said, participants are interested in specific geo-information, e.g. the locations where TKK is recorded, since those are almost always Dutch museums with interesting histories.
- **Specificity increases interest:** For the example chapter of a gold watch by famous horologist Breguet, the participants indicated that merely the concept of “1820” (the year the watch was made) was not interesting to them, but *combining* this concept with another (e.g. ,watches’) would provide more specific enrichments. Thus, the more specific the related information is for a chapter, the better. Also, linking to Wikipedia was considered to be somewhat superficial; participants would like to get more in-depth (editorial) information.
- **Stories:** The main reason the participants watch TKK are the stories told by the expert about the object, and the personal history discussed by the person who brings in the art object. This is related to the above-mentioned information need of specificity: the closer LinkedTV can get to enrichments directly related to the art object, the better.
- **Visual enrichments:** The participants would appreciate to see more visual enrichments, such as related photos and videos, such as related chapters from other TKK episodes or a timeline of artworks made by the same artist as the one who made the art object featured in a given chapter.

² See LinkedTV deliverable D6.3 for more information about the user trials.

- **Personalised enrichments:** Since LinkedTV can present many enrichments for a given chapter, participants suggested to base these on their preferences for specific topics and types of objects.
- **Separate general TKK information from specific chapters:** In TKK, the same presenter and moderators are present in each show. The additional information to these kinds of concepts should not be treated in the same way as other concepts related to specific chapters, but shown in a generic information page.
- **Non-linear viewing and browsing:** In general, participants liked the possibility to skip chapters and watch them in a non-linear way on the main screen. They also liked the idea of bookmarking several chapters from different episodes and then watching them as a playlist on the main screen. Finally, participants would like to browse through (recommended) chapters, based on their preferences for specific object properties like type (e.g.: 'painting') and style (e.g.: 'art nouveau')

2.2 New scenario descriptions

Based on the above user insights, the description of the scenario has been refined to reflect the typical viewer interests when watching an episode of Tussen Kunst & Kitsch. The episode chosen for these descriptions is from the Museum Martena in Franeker, focused on the chapter with a Silver Tea Jar. We retain the distinct personas defined in the original scenario which reflect distinct viewer types of TKK, and allow us to also reflect in the descriptions the different experiences of interaction with LinkedTV each one can have, while watching episodes of Tussen Kunst & Kitsch.

2.2.1 Scenario 1 - Rita: Tussen Kunst & Kitsch lover (young, medium media literacy)

Who:

- Name and occupation: Rita, administrative assistant at Art History department of the University of Amsterdam
- Age: 34
- Nationality / place of residence: Dutch / Amsterdam
- Search behaviour: Explorative
- Digital literacy: Medium

Rita is an administrative assistant at the Art History department of the University of Amsterdam. She didn't study art herself, but spends a lot of her free time on museum visits, creative courses and reading about art. One of her favourite programmes is Tussen Kunst & Kitsch (an Antiques Roadshow by public broadcaster AVRO), which she likes to watch because, on the one hand, she learns more about art history, and, on the other hand, because she thinks it's fun to guess how much the objects people bring in are worth. She's also interested in the locations where the programme is recorded, because this usually takes place in a historically interesting location.

Goals / Information need:

- More background information on the objects and their value.
- More information on the programme host and experts.
- More information on the locations where the programme is recorded.
- Sending a selected part of the background information found to her sister.
- Planning a visit to the museum where the episode was recorded.

Scenario

Rita is watching the latest episode of Tussen Kunst & Kitsch. She's **logged in** to the LinkedTV application, so she can **bookmark** the show's chapters she'd like to learn more about after the show. Watching the show *and* reading the extra information is usually too much to handle. She prefers to take her time to delve into the interesting extra information after the show.

The show's host, Nelleke van der Krogt, gives an introduction to the programme (Figure 1). Rita wonders how long Nelleke has been hosting the show and who were the hosts before her, since it's been on for a very long time, but Rita didn't start watching it until 2003. Rita sees that a timeline of Nelleke's career is available and looks at the various films and programmes she's been involved in.



Figure 1: Screenshot of the introductory chapter of the Museum Martena in Franeker, TKK episode of 14 November 2007

Rita sees the show has been recorded in the Museum Martena in Franeker. She has always wanted to visit the museum, and to find out the history of the museum building. She hears Nelleke say that there is a period room ("stijlkamer") in the museum from the 18th century (Figure 2). Rita loves period rooms, and would like to know which other museums in the

Netherlands have one. She **bookmarks** the chapter to view the related information after the show is over.



Figure 2: Screenshot of the 'Stijkamer' in Museum Martena

After the show has introduced the Museum Martena and its history, the objects brought in by the participants are evaluated by the experts. One person has brought in a silver Frisian tea jar from the mid-18th century. She's very interested in Frisian heritage, since her mother is from Friesland and she learnt the Frisian language from her. The expert, Emiel Aardewerk, states that the tea jar is a typical example of Frisian Silver. Rita didn't even know there was such a thing! She'd love to learn more about the history of Frisian Silver. Furthermore, she's really keen on seeing more chapters from TKK regarding Frisian objects. Again, she **bookmarks** the chapter for later exploration.

The final person on the show (a woman in her 70s) has brought in a painting that has the signature 'Jan Sluijters'. This is in fact a famous Dutch painter, so she wants to make sure that it is indeed his. The expert - Willem de Winter - confirms that it is genuine. He states that the painting depicts a street scene in Paris, and that it was made in 1906. Rita thinks the painting is beautiful, and wants to learn more about Sluijters and his work. She learns that he experimented with various styles that were typical for the era: including fauvism, cubism and expressionism. She'd like to see a **general overview of the differences of these styles** and the **leaders of the respective movements**.

Since she's not so interested in the next chapter about a golden watch, she uses the LinkedTV application to navigate back to the Jan Sluijters chapter, and explores the background information. She sees that the art style of the painting is 'Fauvism', and selects this concept. In the information screen she sees **related art styles** and a **related chapter** from the TKK archives on Leo Gestel, a **contemporary** of Jan Sluijters.

At the end of the programme, she decides she definitely wants to go and visit the Museum Martena and that she wants to find out which museums have period rooms, so she can maybe hop around and explore these types of museum exhibits. She accesses the Museum Martena website from the LinkedTV application and emails the link to her sister, who's also an avid LinkedTV user and has a great interest in art history as well. She later calls her sister to tell her to check the shared information and plan their visit together.

Scenario summary

1. Introduction of Rita as persona
2. Rita logs in to the LinkedTV application, so she can bookmark chapters that interest her.
3. Rita is interested to find out more about the host Nelleke van der Krogt.
4. Rita wants more information on the location of the programme, the Museum Martena and the concept of period rooms.
5. Rita wants more information on an object, the Frisian silver tea jar, and Frisian silver in particular.
6. Rita wants to bookmark this information to look at more in-depth later.
7. Rita wants to learn more about painter Jan Sluijters and the art styles he and his contemporaries represent.
8. Rita wants to plan a visit to the Museum Martena.
9. Rita invites her sister to join her when she visits the Museum Martena.
10. Rita switches off.

2.2.2 Scenario 2 - Bert and Anne: Antiques Dealer, volunteer (older, high + low media literacy)

Who:

- Name and occupation: Bert, antiques dealer. Anne, volunteer at retirement home.
- Age: Bert - 61, Anne - 59
- Nationality / place of residence: Dutch / Leiden
- Search behaviour: Bert - Focused. Anne - Explorative
- Digital literacy: Bert - High. Anne - Low

Bert has an antiques shop in Leiden, which he has owned for the past 25 years. He studied Egyptology and Early Modern and Medieval Art at his alma mater, Leiden University. He visits many art fairs and auctions - both national and international - but also takes part in online auctions and actively scours the web looking for information on objects he's interested in purchasing and re-selling. He likes to gather information quickly and usually has a specific topic and goal in mind. He likes that Tussen Kunst & Kitsch touches upon so many different

objects, art styles and art-historical themes. Also, the experts are really knowledgeable; it's always nice to hear good colleagues talk! Although not all types of objects interest him - clocks and watches don't really do it for him - every episode has at least one or two objects that he really wants to learn more about. Due to his studies, he's especially keen on objects from Egypt (5th millennium BC-4th century AD), medieval art (roughly 200 AD-1500 AD) and objects from the early modern period (+/- 1500-1800 AD). Bert does not actively look for additional information during the show, as that distracts from what's being said, but does do so when the show is over. Anne does not deal with art on a daily basis like her husband, although she also really likes the show. She just enjoys sitting back and being amazed when an object turns out to be really valuable. Anne asks Bert to look up extra information when she's triggered by a certain artist or art style, since he always does that anyway. When an object is discussed that doesn't really interest her, she'll just read a magazine or make some tea and tune back in when the chapter is over.

Goals / Information need:

- Thematic, non-linear viewing
- Extra information within specific entity types
- Viewing chapters with similar entities
- Specific interest in certain art periods
- Read-later option for enrichments

Scenario:

Bert has recently bought a wooden statuette depicting Christ at an antiques market for €100. He suspects it is quite old (17th century) and that he could re-sell the object for a nice price in his shop. He's done quite a bit of research online already, but as he's watching Tussen Kunst & Kitsch - like he does every week - he sees a chapter about an oak statue of a Maria figure that was made in the late 17th century (Figure 3). This might be very relevant for him!



Figure 3: Screenshot of the wooden statue, TKK episode of 21 December 2011.

The expert says that the statue in the programme was originally painted and originates from the south of the Netherlands, the province of Brabant. The value is estimated at €12,500. Although the statue in the programme differs from his, since it depicts Christ and not Maria and it does not seem to have been made in the same style, he does feel that he's on the right path in finding more information. He bookmarks the chapter, and consequently all information sources related to the chapter.

The next chapter in the programme concerns a gold watch by famous watch maker Breguet (Figure 4). Since clocks don't really interest Bert, he starts to read some basic information related to the wooden statue (date, provenance, value) and looks a visual overview from Maria statues. Anne however really likes the watch: it looks just like the one her father owned! The man who's brought in the watch tells the expert and host Nelleke van der Krogt that his grandfather bought it at the 1899 World Fair in Paris.



Figure 4: Screenshot of the Breguet watch, TKK episode of 31 July 2010.

The watch itself is older than that though: expert Fred Kats estimates it was made around 1820. The watch is a Jacquemart, a clock system that produces sound by having one or more human figures strike the bells. These specific Jacquemart figures depict the Greek gods Hebe and Karitas. Anne vaguely remembers the myths surrounding these gods, but she doesn't really remember them since high school was the last time she had to study this. She'd like to brush up on this knowledge. Although Anne's interested to delve right into this information, she also wants to relax and finish watching the programme. Anne asks Bert to specifically bookmark the additional information about Hebe and Caritas, so she can look at it later. Fred Kats then says the watch is by the famous watchmaker Breguet from Paris. It must be worth quite a lot! Indeed, the watch turns out to have a value of at least €9,000-€10,000.

Next up is a chapter on a silver Frisian tea jar from the 18th century. This is not really Bert's cup of tea, but Anne's interest is triggered by the expert's remark that at that time the tea itself was worth more than the silver jars in which it was kept. She wants to know more about it and again asks Bert to bookmark the chapter for her.

When the episode is over, Bert continues to read more about information related to the wooden statue. He sends the information sources to Anne about the Hebe and Caritas myths and the silver tea jar from his bookmarks via email, so she can check this out on her own device.

Scenario summary

1. Introduction of Bert and Anne as personas.
2. Bert sees a chapter about a statuette from the late 17th century, which is worth 12,5K, which is similar to a statuette he recently bought.
3. Bert bookmarks this chapter, so he can view it and the information sources related to it later on.
4. Bert immediately gets the chance to do so, because a chapter about a watch is next, something he doesn't really care for.
5. Anne is however very interested in the watch chapter: it depicts gods from Greek mythology and she wants to brush up on her knowledge. She asks Bert to bookmark the information to the Greek gods to read later.
6. Bert is not interested in the silver tea jar, but bookmarks the chapter for Anne, because she wants to know why tea was so expensive in Holland in the 18th century.
7. Anne would like to know more on why tea was so valuable (more than its silver container!) in the 18th century. Bert bookmarks the silver tea jar chapter for her.
8. Bert and Anne read and watch the additional information related to the silver tea jar and wooden statue chapters after the show. Bert has sent the latter to Anne through email, so she can explore Greek mythological aspects on her own device.

2.2.3 Scenario 3 - Michael: library manager

Who:

- Name and occupation: Michael, library manager at a public library.
- Age: 55
- Nationality / place of residence: Dutch / Laren
- Search behaviour: Explorative and focused
- Digital literacy: High

Michael is a librarian of the public library in Laren. He studied at the Library and Documentation Academy in the 1970s and has worked in the information science field ever since. He keeps up with the latest technical developments and has equipped his house with the latest video and audio equipment, has a big smart television and quite a nice collection of other gadgets. He likes to watch *Tussen Kunst & Kitsch* not just because of his leisure interest in art history, but also because of the information provided by the experts. He's always triggered to look up more information online based on what they tell on the show. Michael is also an avid Tweeter and shares his opinions about *Tussen Kunst & Kitsch* and the additional information he is presented with by the LinkedTV system during and after the programme is aired. He also neatly organises playlists with chapters he's bookmarked, and has divided them in various categories, periods and locations. But being a library manager, he also prides himself in finding more information online not provided by LinkedTV, and when he does add these links to the information sources of the chapters he finds the most interesting.

Goals / Information need:

- Making and curating playlists

- Content recommendations - other TKK chapters
- Suggesting information sources to TKK editors
- Browsing related chapters
- Pausing an episode

Scenario:

Michael gets home a bit later from work than planned, and has missed his favourite programme, Tussen Kunst & Kitsch. He opens the LinkedTV application on his tablet, logs in, and sees the latest episode on the home screen. He starts playing it, but the first chapter is about a book, which he's not so interested in and he **skips it**. The next chapter about a Delftware plate does interest him (Figure 5). He **sends the chapter to the main screen**, so he can read more information about the plate while the video keeps playing on the main screen.



Figure 5: Screenshot of the Delftware plate, TKK episode of 28 December 2011.

The guest doesn't know much about the plate, but European pottery expert Robert Aronson give more background. It was made in 1670 and depicts an oriental-style scene. Actually, Michael is not that interested in Delftware with these oriental depictions. He decides that this chapter isn't what he was hoping for, since he's more interested in other Delft pottery, particularly from the Delft-based factory De Porceleynse Fles. He looks for related chapters from the Tussen Kunst & Kitsch archive that he quickly browses through. He finds chapters from an episode that was actually filmed at De Porceleynse Fles in 2008. Michael **pauses** the episode to check out one of the related information sources: the website 'Delfts Aardewerk' of the Gemeentemuseum Den Haag. He finished exploring the chapter by adding **related chapters** to his playlist "Delftware".

Next up is a chapter on a Dutch clock from the first decennium of the 20th century. It was made by Jan Eisenlöffel, a Dutch goldsmith, interior designer, jewelry designer and

illustrator, who wanted to reach a large audience with the everyday objects he designed. He was influenced by famous Dutch architect H.P. Berlage, and the clock on the show was made in the “Nieuwe Kunst” style, a variation on the famous Art Nouveau style. Great! Michael loves Art Nouveau and wants to learn more about Jan Eisenlöffel, “Nieuwe Stijl”, and see other chapters related to Art Nouveau. He explores these things, and bookmarks three recommended TKK chapters related to Art Nouveau to watch later.

The next chapter is about a silver tea jar from 18th century Friesland (Figure 6).



Figure 6: Screenshot of the silver tea jar watch, TKK episode of 14 November 2007

He remembers the silver box he inherited from his great-grandparents, but since they were from England, he doesn't think the box on the show is comparable. He sees that there are recommendations of similar objects from not just other Tussen Kunst & Kitsch chapters, but also from external sources. Michael sees a recommended object from Europeana, a silver etrog box used for the Jewish festival of Sukkot, which was made in London in 1867 (Figure 7).



Figure 7: Example of an etrog box, found in Europeana.³

Yes, this is more like it; he never knew he possibly owned a precious etrog box! He bookmarks the chapter to save the Europeana link for later exploration.

Scenario summary:

1. Michael comes home late and has missed the latest Tussen Kunst & Kitsch episode. He logs in to the LinkedTV application and starts watching it from there.
2. He skips the first chapter that doesn't interest him, and then starts watching one about a Delftware plate.
3. He likes Delftware, and sends the chapter to the main screen to explore more information about the plate on his tablet. It turns out he doesn't like this specific plate much.
4. He selected a related chapter filmed at De Porceleynse Fles, a renowned Delftware factory in Delft. This is about a plate he does like.
5. He adds relevant Delftware chapters to his "Delftware" playlist.
6. After this, there's a chapter on a silver box, which reminds him of silver box he inherited from his grandparents.
7. Michael sees a link to similar content related to the chapter and finds another box similar to the one he owns. He bookmarks the chapter and shares the link via Twitter.

³ See

<http://www.europeana.eu/portal/record/09307/53AD9575C0AA4CDA4BAAB5C3FF924ED307BF49B6.html>

2.3 Use of new LinkedTV functionalities

To implement LinkedCulture, we refined and extended the generic LinkedTV analysis, annotation and enrichment workflow and implemented this as a specific configuration on the LinkedTV Platform when ingesting and preparing enriched content for Tussen Kunst & Kitsch episodes. This workflow is illustrated below (Figure 8):

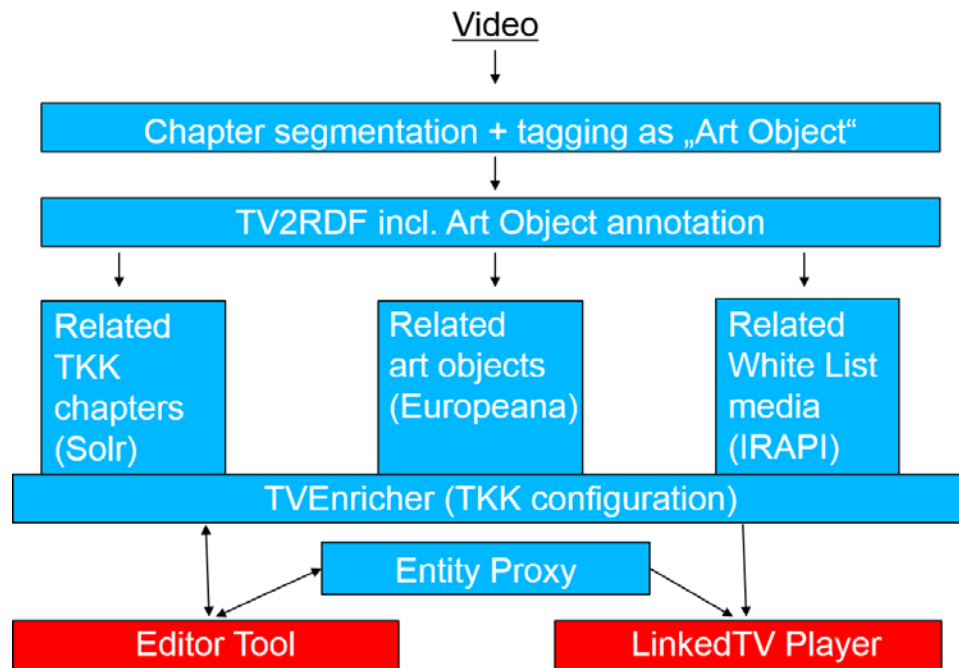


Figure 8: LinkedTV enrichment workflow for the LinkedCulture scenario

The primary adaptation of LinkedTV enrichment for the LinkedCulture scenario has been to define the concept of an Art Object and focus enrichments for the viewer around this concept, since it is the art objects brought to the experts by someone from the general public which the TKK viewers are primarily focused on when watching.

- “Bumper detection” (WP1) has been introduced to adapt the video segmentation into chapters to the particular structure of TKK programmes, in particularly to be able to automatically detect the beginnings and endings of segments around a single art object. Chapters which contain art objects are tagged as such to guide the subsequent processing.
- The Editor Tool (WP1), as part of its new release, supports the creation of art objects as a type of annotation applied to a video chapter and provides the editor with the means to add values of every property of an art object through the tool interface and save these as RDF to the LinkedTV Platform.
- TV2RDF (WP2) can now handle art objects detected in the media analysis step and serialise information about them into the RDF annotation of the TKK programme. Currently it is not trivial to automatically detect which visual forms in the video chapter are the art object itself but if an editor can select one visual instance of the art object, an experiment to run object re-detection using CERTH tools with this has proven that

art objects can be successfully detected throughout video chapters. This can provide an image thumbnail for the art object to be used in the Player.

- Related video chapters from LinkedTV's own archive of annotated TKK episodes can be found and suggested as enrichments for any video chapter containing an art object using the newly set up Solr index, based on a search for chapters with related items.
- TVEnricher (WP2) has been extended to support retrieval from Europeana using its API. The implemented Europeana module is focused on retrieving related art objects to a "subject" art object which was annotated to a video chapter.
- The crawler module (IRAPI) for the TKK white list has been refined to support extraction of links to embedded media, firstly on the broadcasters AVRO website as stakeholder in this scenario, so that the index of available AVRO media grows and that enrichments of TKK programming can be extended to related media from AVRO's own archive (not just the TKK programme which is indexed by LinkedTV itself).
- An Entity Proxy (WP3) has been created to support the provision of information cards as enrichments for all LinkedTV scenarios. This extends the original enrichment frame containing a concept's title, description and thumbnail image with a set of properties and their values for specific types of concept which are common in the scenarios such as a Presenter, Museum or (historical) Person.

2.4 New LinkedTV player interface

Following on from last year's scenario realisation over a generic user interface supported by the LinkedTV multiscreen toolkit, we were sure that it would be vital to offer a more domain and programme specific user interface for TKK to its viewers. This was also validated in the interviews with viewers as part of the user trials. Hence LinkedCulture not only relies on a specific configuration of the LinkedTV workflow for TKK in the backend but we modelled a dedicated UI for the LinkedTV player which highlights to viewers the TKK programme as a set of art object-centric video chapters and eases the task of browsing related content along the dimensions of most interest to them: similar art objects in other TKK chapters, similar art objects in cultural heritage collections (using Europeana) and characteristics of interest of particular art objects.

LinkedCulture has been implemented as a Web based application for companion devices, most suitably tablets or laptops. There are various modes in which the LinkedCulture application can be used:

- Web and TV synchronized: as the viewer watches TKK on the main screen, the LinkedCulture application displays the related information for each art object. This changes when the chapter about the art object ends and the next one is discussed.

- Catch-up TV: the LinkedCulture application contains an overview of episodes of TKK, so if a user has missed an episode, (s)he can go to the application on their laptop or tablet to view it.
- TV on the Web: the user starts on the tablet in the catch-up TV mode, but can also send chapters to the main screen from the tablet. This can be done for an entire episode, but also non-linear if the user is more interested in exploring the rich TKK archive of chapters based on related concepts (e.g. art styles, creators).

The main functionalities of the Y3 LinkedCulture demo and how it can be used are demonstrated by the screenshots below:

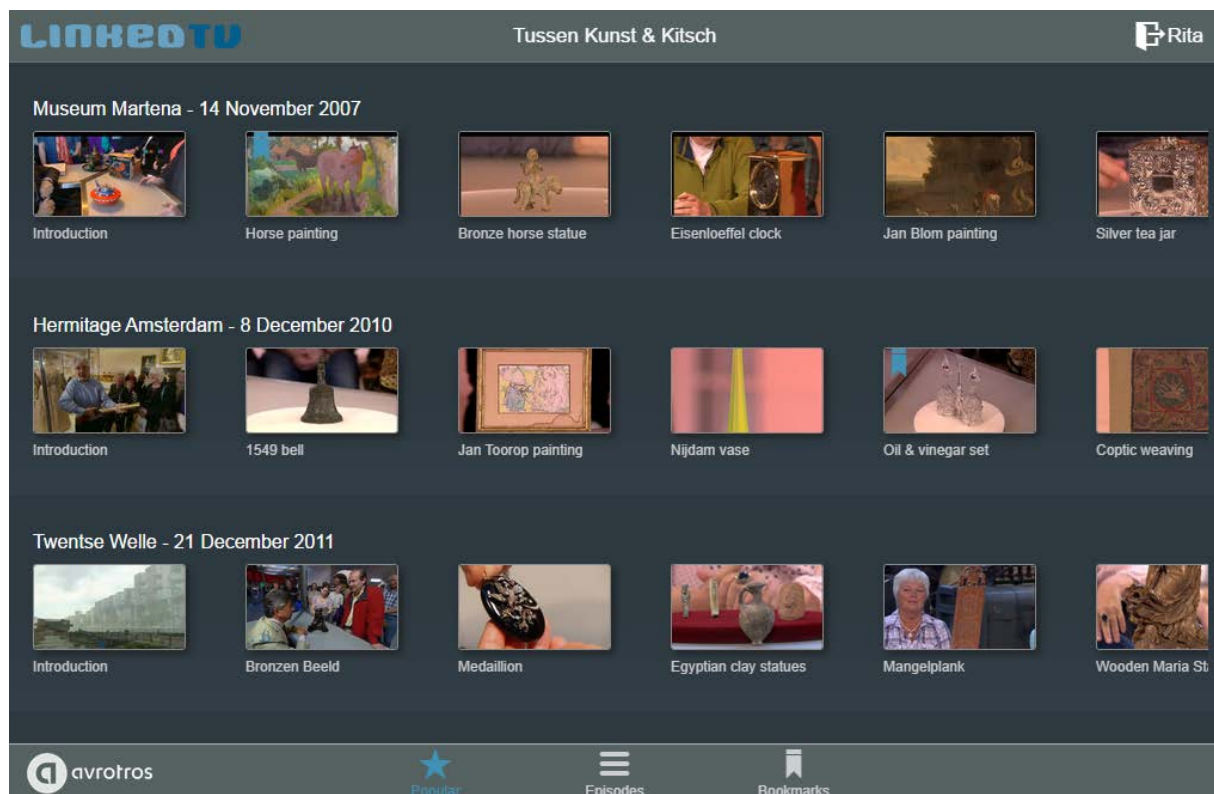


Figure 9: LinkedCulture start screen.

On the top right, you can see the user that is logged in, allowing for personalisation. The top three popular episodes are displayed, and the user can see the chapters related to this episode. By dragging/swiping this chapter timeline, more chapters can be revealed. From this screen, the user can 1) select a chapter to watch (Figure 9), 2) click/tap the 'episodes' button to see the entire archive of TKK episodes available in LinkedCulture (Figure 10), and 3) view his/her bookmarks (Figure 11).



Figure 10: Overview of TKK episodes in the LinkedCulture app.

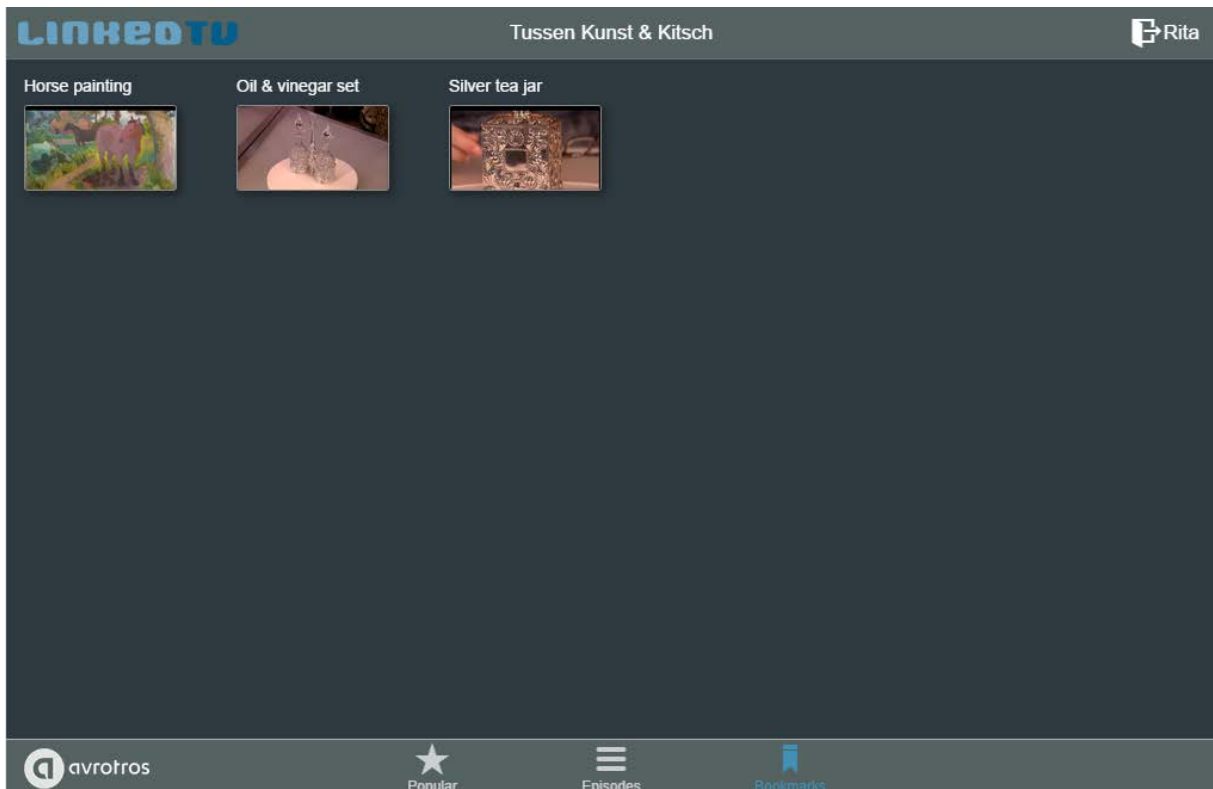


Figure 11: Overview of bookmarked TKK chapters in the LinkedCulture app.



Figure 12: Viewing the episode

When a user selects a chapter from the start screen, this chapter then starts to play in the context of the TKK episode it is part of. In this example, Rita has selected the introduction episode, because she wants to view the entire Museum Martena episode from beginning to end (Figure 12). On the left, the user sees a scrollable list of chapters in the selected episode. If a user has previously bookmarked a chapter, the bookmark icon is highlighted in blue. On the top right, the highlighted eye icon indicates that personalisation is activated. Bottom from left to right: the user can pause and mute the episode, see in which part of the episode the chapter is playing in the timeline, reveal information about the chapter, send the chapter to the main screen, or watch the video in full-screen.

← Back Museum Martena - 14 November 2007

CURRENT **ABOUT**

ABOUT

Date: 1742

Location: Friesland

Material: silver

Subject: Frisian silver

Subject: Master sign

Subject: Silver smith

LOCATION: FRIESLAND Source: nl.dbpedia.org

Population: 646305

Friesland [ˈfrislant] (Geluidsfragment uitspraak (info / uitleg)); Fries en officieel: Fryslân (Geluidsfragment uitspraak (info / uitleg)) is een provincie in het noorden van Nederland. Friesland telt 647.239 inwoners (30 september 2012). De hoofdstad is Leeuwarden. Zowel het Fries als het Nederlands heeft in de provincie de status van bestuurstaal.

BACKGROUND

RELATED WORKS

RELATED CHAPTERS

avrotros

Figure 13: General 'about' information related to the Silver tea jar.

When a user selects the information icon to learn more about the art object discussed in a chapter, (s)he sees four enrichment dimensions (Figure 13): a general 'about' dimension, more background based on the white list of sources (in the TKK case e.g. Dutch museum websites and the AVRO website), related works which displays similar works on Europeana (see also Figure 14 below) and related TKK chapters. The user sees a summary in the 'about' dimension based on information in DBpedia using the entity proxy. The source of the information is also displayed, which the user can also visit for the complete context.

The screenshot shows a mobile application interface for a museum exhibit. At the top, there is a header with a back arrow, the text 'Museum Martena - 14 November 2007', and an eye icon. Below the header is a navigation menu with sections: 'CURRENT', 'ABOUT', 'BACKGROUND', 'RELATED WORKS', and 'RELATED CHAPTERS'. The 'CURRENT' section is active, showing a list of items: 'Eisenloeffel clock', 'Jan Blom painting', 'Silver tea jar', and '19th century broc...'. The 'RELATED WORKS' section is expanded, showing a list of 'Theebus' items. The main content area displays the details for 'THEEBUS' from the 'Amsterdam Museum'. It includes a thumbnail image of a silver teapot, the title 'THEEBUS', the source 'Amsterdam Museum', and the following metadata: Creator: Breda, Jan (goud- en zilversmid), Date: 1700, Format: hoogte 4.1 cm. A description follows: 'Theebus in de vorm van een hoekige fles voor het opbergen van de losse thee, het dekseltje diende vaak als maatbekertje voor het vullen van het voortrek potje.' At the bottom, there is a playback control bar with the 'avrotros' logo, play/pause buttons, a progress bar, and icons for information, mobile device, and full screen.

Figure 14: Works related to the Silver tea jar, showing similar items from Europeana.

The related works dimension shows works from Europeana and displays the most salient metadata about the work (Figure 14). From top to bottom, the user sees:

1. The title
2. The organisation providing the data (in this case Amsterdam Museum)
3. The creator
4. The date
5. The size
6. The description.

Furthermore, the thumbnail of the object is shown. For more context, the user can also go to the page of the work on europeana.eu.

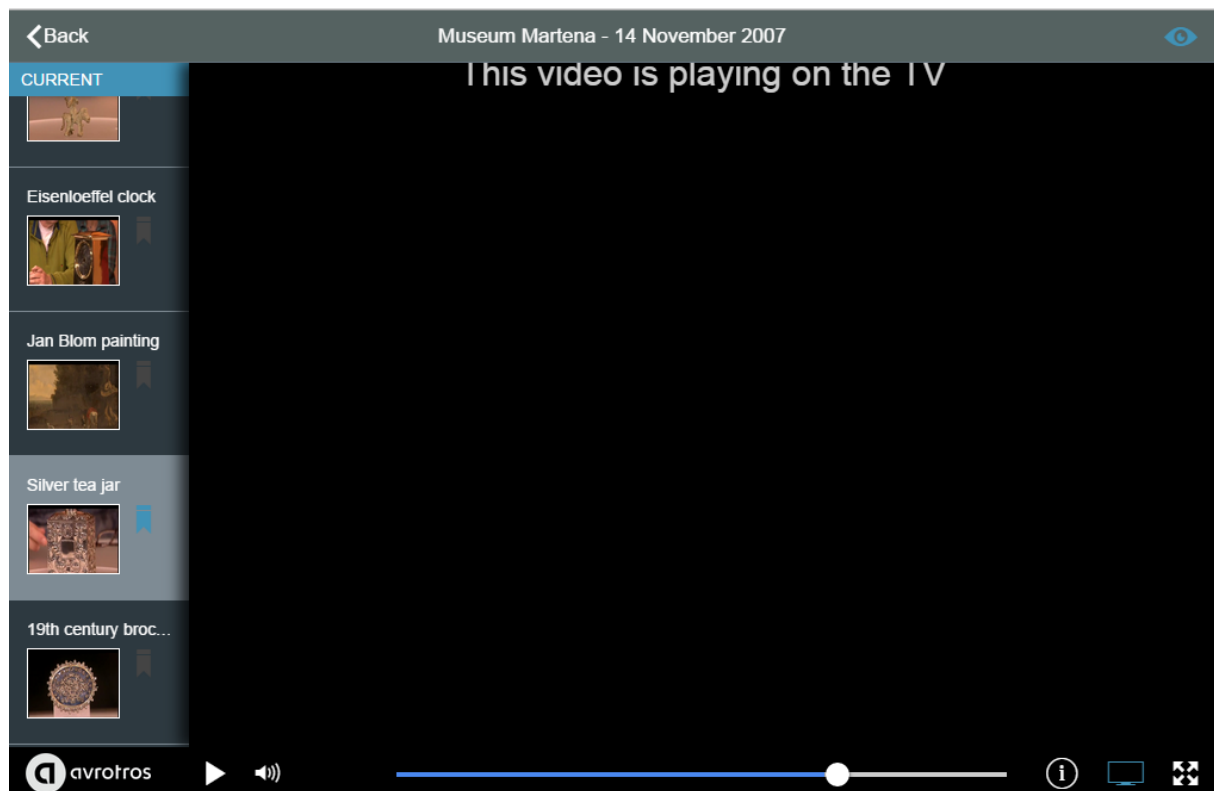


Figure 15: TV on the Web mode

The user can also opt to send the video to the main screen in order to either relax and lean back to view the episode, or to explore the information while simultaneously viewing the episode (Figure 15: The video now plays on the main TV screen).

2.5 Realisation of the scenario

Michael comes home late and has missed the latest Tussen Kunst & Kitsch episode. He logs in to the LinkedTV application and starts watching it from there. He skips the first chapters that do not interest him, and then starts watching the next one about a Delftware plate (Figure 16).



Figure 16: Michael is watching the highlighted Delftware plate chapter

He likes Delftware, and sends the chapter to the main screen to explore more information about the plate on his tablet. It turns out he doesn't like this specific plate much. He selects a related chapter filmed at De Porceleyne Fles, a renowned Delftware factory in Delft. This is a Delftware plaque he does like (Figure 17).

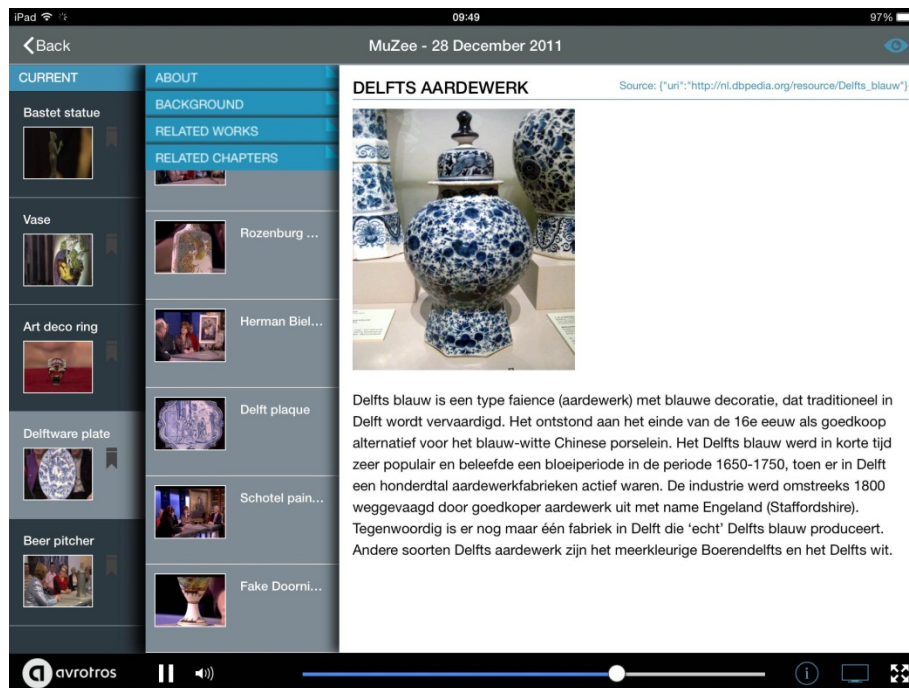


Figure 17: Extra information on the second screen, chapter viewed on the main screen.

After this, Michael views a chapter on a silver box, which reminds him of a silver box he inherited from his grandparents. Michael sees a link to similar content related to the chapter and finds another box similar to the one he owns. He bookmarks the chapter (Figure 18).

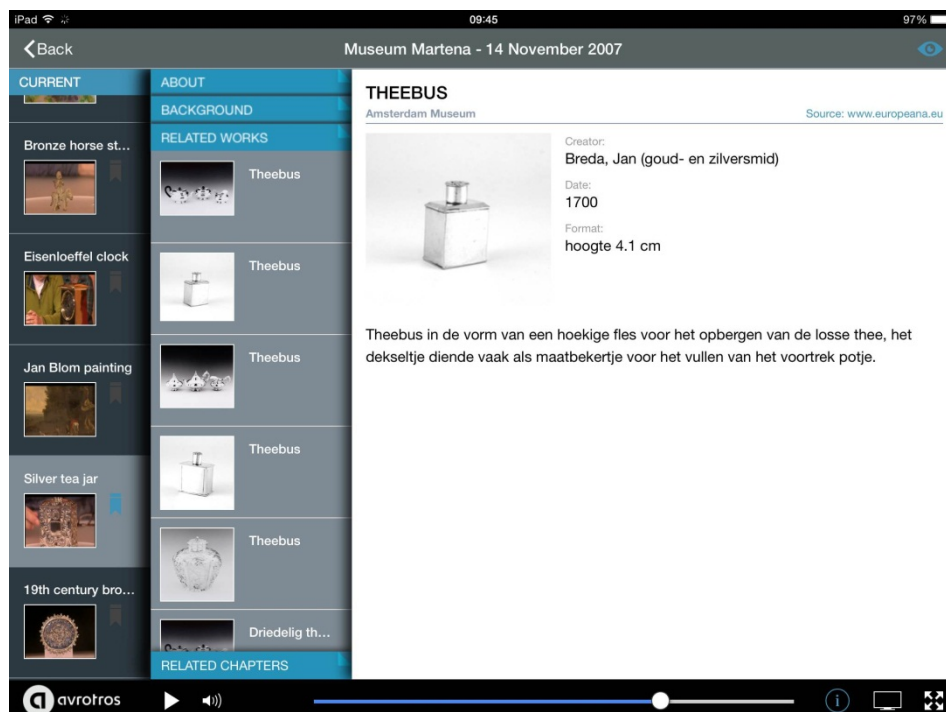


Figure 18: The Silver tea jar is bookmarked (see chapter thumbnail left). The tea jar Michael recognises as being similar to the one he inherited is visible on the right part.

The realization of the LinkedCulture scenario is reflected in a video recording of the use of the LinkedCulture application, shared via LinkedTV Social Web channels and on the website.

3 “Linked News” – the RBB AKTUELL scenario

The scenario led by our partner RBB explores the enrichment of their TV programme RBB AKTUELL (daily local news from the region of Berlin and Brandenburg). More background to this scenario can be found in LinkedTV D6.2 Scenario Demonstrators (v1). Public content associated with this scenario is collected online at <http://www.linkedtv.eu/demos/linkednews>.

3.1 Lessons learnt from user trials⁴

In general, the outcomes of the end user trials were very positive and did not hold many surprises. Most of the results confirmed the team's expectations and the original strategies. The main triggers for our scenario update were:

- **Our users are primarily viewers.** That is, the main focus of a TV viewer is on watching the news on the main screen, in our case on the TV screen. Dividing their attention between the main screen and the second screen while the news video was playing repeatedly caused irritation;
- **All participants agreed that the application would be more suitable to use AFTER viewing the show.** During the live show they want to focus on the programme and don't want to be disturbed with too much information on the main screen or on the second screen. Two of them mentioned that it would be much easier to understand if some kind of info (text or icon) would be displayed for a short time on the main screen signalling the availability of new additional information on the second screen;
- **Users mentioned that they would like to see more related video content** (so far most links were largely text);
- **Users also stated that they would like to see more RBB content** and less external pages or videos;
- **A more personal relation to the related content would be attractive:** some users asked for sharing features, one would have liked more personal recommendations and maybe even an alert service as soon as new content was available for her.

3.2 Updated scenario description

For the update a more recent episode of RBB AKTUELL, from 2 June 2014, was selected.

An implementation of enriching a live news broadcast has been discussed and outlined for further investigation in the remaining months 37-42 of the LinkedTV project. For the moment, the scenarios described below still assume that the LinkedNews service is an on demand

⁴ See LinkedTV deliverable D6.3 for more information about the user trials.

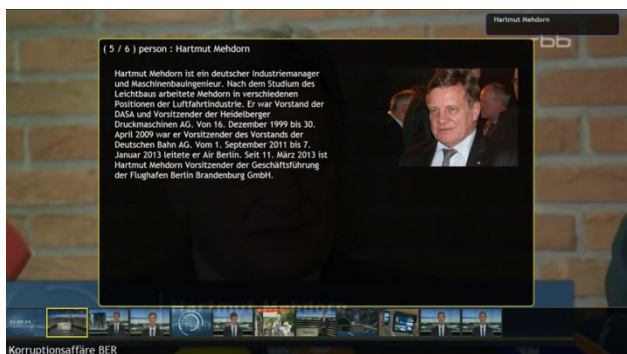
service, relying on RBB's CatchUpTV offer. This also allows viewers to skip chapters within the news programme while watching or pause while exploring news enrichments.

In this new version, LinkedTV enrichments are offered in a three level solution:

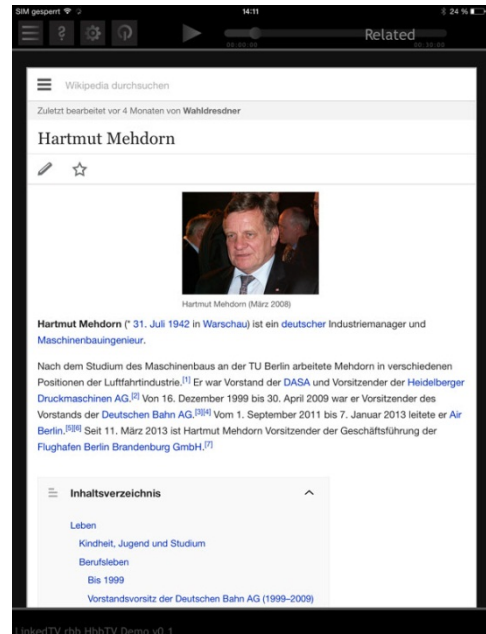
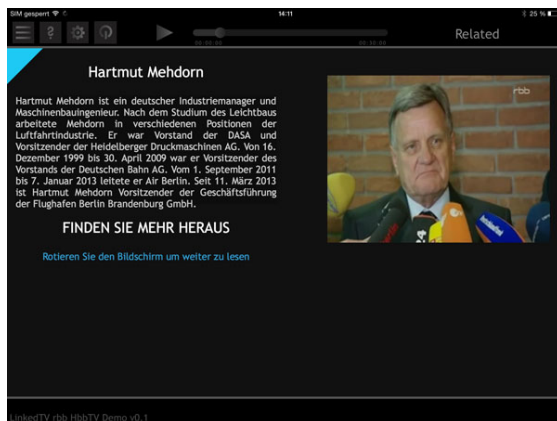
1. The first logical level is **watching TV without extra information**



2. Interested users can **check 'information cards' on the TV screen (HbbTV)**



3. If the introductory information cards raise more interest, **in-depth information can be found in the companion app on the tablet.**



The personas from last year's scenario have been kept but now we describe their experience with the new RBB content and also reflect how different viewer types like to access the LinkedTV enhancements in different ways.

3.2.1 Nina - LinkedNews Scenario 2014

Urban mom Nina is very interested in many topics, from local to international politics, to health and environment, to culture and everyday things like the weather. She is generally well-informed, thus generic background information is often useless or, in other words: a Wikipedia link doesn't bring much extra value. Editorially tailored articles and dossiers, however, are often of great interest to her.

The tablet is her main screen rather than her TV, not only because she is young and innovative and keeps playing around with the tablet any free minute to escape from her daily responsibilities, but also because it makes her more mobile, especially if the service enables her to "take away" the enrichments.

Personalisation

Nina's show always has that chapter first on the list which was detected as the most relevant according to her profile settings - but switching back to default view is very intuitive and often used whenever she gets bored or hears things that she already knew.

According to her preferences Nina will receive the topics in the order described in the following (#1, #2, #4, #5, #8, #9, #7, #3, #10, #6, #11).

Chapter 1: New Reproach against BER Management

Nina is generally interested in Berlin politics and has been watching the developments around BER airport closely. She found it especially interesting that Governing Mayor Wowereit and the BER holding invited Hartmut Mehdorn to become BER top manager, although under his lead Deutsche Bahn had almost gone bankrupt.

She bookmarks the BER dossier to take another look at the chronology of the series of scandals and hilarities around Berlin's airport-to-be.

She doesn't like the Pirates party (Die Piraten), but they started playing an interesting role in German politics, so she couldn't afford to miss what they are saying - in effect that means that although she would not want to miss news items where they give their comments, she is not interested in reading background information.

Chapter 2: Danger of a Blackout?

Would police, fire and other rescue service still work, if all electricity went off? This is definitely a matter of importance for an urban mother! She consumes all the information about Energy, the Berlin Fire Dept., Berlin police, Berlin's public transport service providers.

Nina really can't stand Berlin's Senator of the Interior, Frank Henkel, but as she is very interested in such security issues she fights the wish to skip and listens to what he has to say.

Listening to Christopher Lauer, another member of the Pirates party (Die Piraten), is equally hard for her to bear, so, as she thinks that this news item seems to be done anyway, she eventually skips to the next chapter.

Now there is also an expert interview on the energy situation in Berlin. As an ecology-minded person, Nina is interested in hearing about how the much discussed Energy Transition can even foster her need for energy security. She picks up her tablet again to check what it might hold for her and takes the time to check the enrichments on the German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung, DIW) which is here represented by the expert interviewee, Claudia Kemfert.

Chapter 4: Brown Coal in Brandenburg

Nina is wondering a little why a news item on Brandenburg should be ranked so high on her preference list, but soon she realises that this is about Renewable Energy, Greenpeace and people's rights, so she listens intensely.

Seeing that politicians of SPD (Social Democrats) and 'Die Linke' (Socialists) act against their own promises really makes her angry, but the fact that people from the area will be relocated from their homes to other places is even more annoying. Nina is interested in the mentioned plans both on the pullout from fossil energies and the relocation of whole villages, so she checks the enrichments to learn more.

And here's the Renewable Energy expert again. Nina liked her arguments in the other interview so she stays interested.

Nina appreciates the people's interests, but this topic is not interesting enough to watch a long documentary, so she ignores the featured link to this on demand video.

Chapter 5: Refugee Camps in Berlin

Nina has followed the story of the refugees on Oranienplatz and the development of the discussions closely. Human Rights and the stories of refugees and how they are treated have always been interesting for her. Usually she likes to look at the situation of refugees in other countries, now she is very interested in seeing what is going on in Berlin and Germany.

Chapter 8: New RBB Smart Apps

Here is a new app!? Of course, Nina is interested in Smartphones, Tablets and other New Media apps and devices, so she listens carefully how the new apps intend to enable user participation.

Chapter 9: Arthaus Festival celebrates 20th anniversary of Arthaus Films

Die Blechtrommel always used to be one of her favourite movies and Nina loves going to the Cinema, but this seems to be more about the Arthaus company. What was that again? Here's one more thing she definitely has to check after the news show is over, so she bookmarks this, too.

Günter Grass has been discussed a lot in past years for his diverse history: he seems to have been in the SS and thus a servant to National Socialism, but in the 1970s and 1980s he

used to be famous for his left-wing activities. How does this go together? Nina checks the tablet for a dossier or related articles from the past.

Chapter 7: Short News Block 2

Charity is always a nice topic, so Nina keeps her attention high.

And here is another heart-melting activity: someone supported the building of a hospice for end-of-life care for children and youths. How could Nina not support this!?

Science is generally a topic which needs to be handled carefully, but Nina is definitely not interested in huge telescopes in Arizona's deadlands.

Chapter 3: Short News Block 1

Nina is shocked that Berlin's police apparently keep records of mental illnesses and even transferable diseases like HIV. What about the German Constitution's first article ("Human dignity shall be inviolable. To respect and protect it shall be the duty of all state authority.")??? This is an outrageous provocation of this basic law!

Another car accident; Bitter but nothing to look behind the scenes. Before she could even consider skipping, the spot was over.

A bike accident! Oh, this is just around the corner, in her neighborhood in Prenzlauer Berg! Maybe she even knew this guy? She quickly thinks who she might have to call, but of course, the news doesn't mention names in such events.

Chapter 10: Medien Morgen

Hearing about the unused station (Geisterbahnhof) underneath Kreuzberg's Dresdner Straße really makes Nina curious and she is very interested in checking available enrichments like a map – Where is Dresdner Straße and why has she never seen a station building there?

Chapter 6: Public Viewing on the Sofa

Nina loves Brazil, but is not interested in Soccer, and she absolutely detests FIFA and what they did to take as much as possible out of the FIFA World Cup. Therefore Nina ignores this news chapter which was automatically sorted at the end of her list anyway.

Chapter 11: Weather Forecast

To make sure, she can always find it without searching too long, Nina activated the option "Weather always last".

3.2.2 Peter - LinkedNews Scenario 2014

Since Peter retired he is mainly interested in culture and sports and everything that happens around him, in Potsdam and the region of western Brandenburg. Peter knows what is going on, but he is always interested in taking a closer look.

He is also quite proud to say that New Media are nothing strange to him although he is already 65! He has always been into new technology and of course he has a SmartTV with

Internet Connection and a small tablet for writing emails and looking at photos his grandparents send to him every once in a while.

Personalisation

When it comes to personalisation, Peter is rather conservative. He trusts the editors that when they deem something very important, it will be very important. To him an editor is almost like a director: he (or she) has a tension curve in mind and Peter wouldn't want to destroy this, so his settings read: "Editor's order".

Peter switches on his HbbTV enabled TV, where his local broadcaster, RBB, is his first address to look for news. As soon as he tunes in at RBB the red button alert pops up to remind him that a simple push on the button brings him extra information. And right now he feels like checking yesterday's late news – a quarter to ten at night is usually too late for him, so he, in fact, likes watching rbb AKTUELL on demand, especially now that they have this nice app on the TV.

Having pressed the red button Peter selects the latest show and watches the introduction with the overview of the main news first. During the short introductory sequence a text box appears, reading:

Arndt Breitfeld

Peter generally likes looking at the Information cards for anchormen. This young man, Arndt Breitfeld seems to be new in the anchorman position, but Peter thinks that he must have seen him before - so he checks the tablet for background information on the young man.

Chapter 1: New Reproach against BER Management

This "new" airport will be old before it shall be opened! It is really embarrassing that the leading politicians of Berlin and Brandenburg claim to be managers of this huge project, but every week - almost every day! - there is a new scandal!

This time it is about corruption! People like this Jochen Großmann waste our public money by dealing contracts to companies he is involved in!? That is absolutely unacceptable! Who is this guy, anyway? Peter had never heard of him before, so it is time to pick up his Remote Control (RC) and push the Arrow Up button. First there appears a band of images with the titles of the news underneath. On another press of the button the bottom part of the screen shows small images of all the things and persons and locations for which RBB prepared extra information. Peter selects the image of a man in a suit which reads „Jochen Großmann“. Pressing OK, Peter learns a few basic things about this guy: hm, born in Dresden, 1958, Entrepreneur and Professor at Technical University Cottbus. Well, that doesn't say too much about the man, so Peter decides to connect his tablet, too, and see, if the Tablet Service has some background information.

As this took him a minute, Peter almost lost track of the news spot, so he decides to bookmark the BER info box for later and follow the next spot for now.

Chapter 2: Danger of a Blackout?

Would police, fire and other rescue service still work, if all electricity went off? Emergency Management is definitely an issue for everyone! Peter listens closely and meanwhile bookmarks the additional information on his favourite topics: Fire Rescue, Police and Technology.

Berlin! It's always Berlin! Does anyone care about the weak infrastructure in Brandenburg? They always talk about Berliner Verkehrsbetriebe and S-Bahn Berlin! The ways are much longer between the small townships in the country and the network of busses and trains is by far weaker.

Peter decides to switch to the next news. Maybe they are not all about Berlin!

Chapter 3: Short News Block 1

Berlin again! But the Short News is usually too short to skip, so Peter stays with it.

Hm, so Berlin's police keep records of people with mental illnesses and Transferable Diseases? But, so what!? That is absolutely logical and fair, because they have to know about these special dangers, or not?

Oh, a car accident on the Autobahn A10 near Ludwigsfelde! That is actually quite nearby, but of course, there is no information on who was involved.

And in Berlin a biker got killed in an accident!? No one knows why this man, 42, unexpectedly changed from bike track to the road, but these bikers are crazy, anyway!

Chapter 4: Brown Coal in Brandenburg

This next chapter is about the Social Democrats and the Socialists, who rule together in Brandenburg, and how they lied to get voted! Peter is truly disappointed that even his preferred party cannot be trusted! Now hundreds of people will have their homes removed, although their parties had promised that this would never happen! Peter is very sad and listens more closely to see, if they say a little about the plans for the people. But the discussion is mostly about the future of the region and renewable energies, so Peter uses the chance to take another look at the Tablet. Where is this village? Welzow? Never heard of it, but yes, there is a link to a map service and it is plain to see that most of the region there is a victim of the Coal Mining industry.

Chapter 5: Refugee Camps in Berlin

While Peter is still checking the tablet for information about what the people of the region think, a new spot about refugees in Berlin, Kreuzberg, starts. As Peter is not at all interested in what the Hippies do in Berlin's streets, he quickly pushed the Arrow Up and skips to the next spot by pushing the Arrow Right and OK on his remote.

Chapter 6: Public Viewing on the Sofa

This looks like a lot of fun: People can bring their sofas into the football stadium and meet there for public viewings! A quick check on the info cards on the TV screen informs him about the organisers of the event and where this all takes place.

Sitting on the sofa and not being alone – how could he not love the idea!? But, unfortunately, the Stadium at Alte Försterei in Berlin Köpenick is much too far away and he has no idea how to get his sofa on the green! But he likes the idea.

Chapter 7: Short News Block 2

Peter had seen this charity campaign at the supermarket and he likes this grey-haired guy, but somehow he still didn't get how he could do any good, i.e. how he could help in this campaign. The tablet certainly has links to further information, so Peter quickly grabs it and pushes the „Charity“ box with the image of this famous guy to the bookmarks section at the top to check it later.

And another charity project: a hospice for children. Good, that someone takes care of them in their last days!

Science and Technology has always been a favourite topic for Peter, so he is especially proud that scientists from Potsdam now send a huge telescope or something to America.

Chapter 8: New rbb Smart Apps

There is the nice young man again, announcing that RBB's news shows, both the one for Berlin and the one for Brandenburg, now launched apps for Tablets. Peter listens closely, trying to understand what makes these better than the one he is using just now – probably it's the option to send comments and even photos or videos if you happen to witness any accident or so. Now that sounds nice, so Peter quickly bookmarks this spot for download information, so he may try them later.

Chapter 9: Arthaus Festival celebrates 20th anniversary of Arthaus Films

“Die Blechtrommel”? Yes, Peter had heard this book title numerous times, but he doesn't know much about it as he preferred reading East-German books at the time. So, he calls up the Information Cards on the TV screen again to get a first notion and see, if he should explore further.

After the first bits of information he decides, he has seen enough. Eventually, Peter closes the service and the TV in general to go and check the bookmarks he had made during the show.

3.3 Use of new LinkedTV functionalities

To implement LinkedNews, we refined and extended the generic LinkedTV analysis, annotation and enrichment workflow and implemented this as a specific configuration on the LinkedTV Platform when ingesting and preparing enriched content for RBB AKTUELL episodes. This workflow is illustrated below (Figure 19):

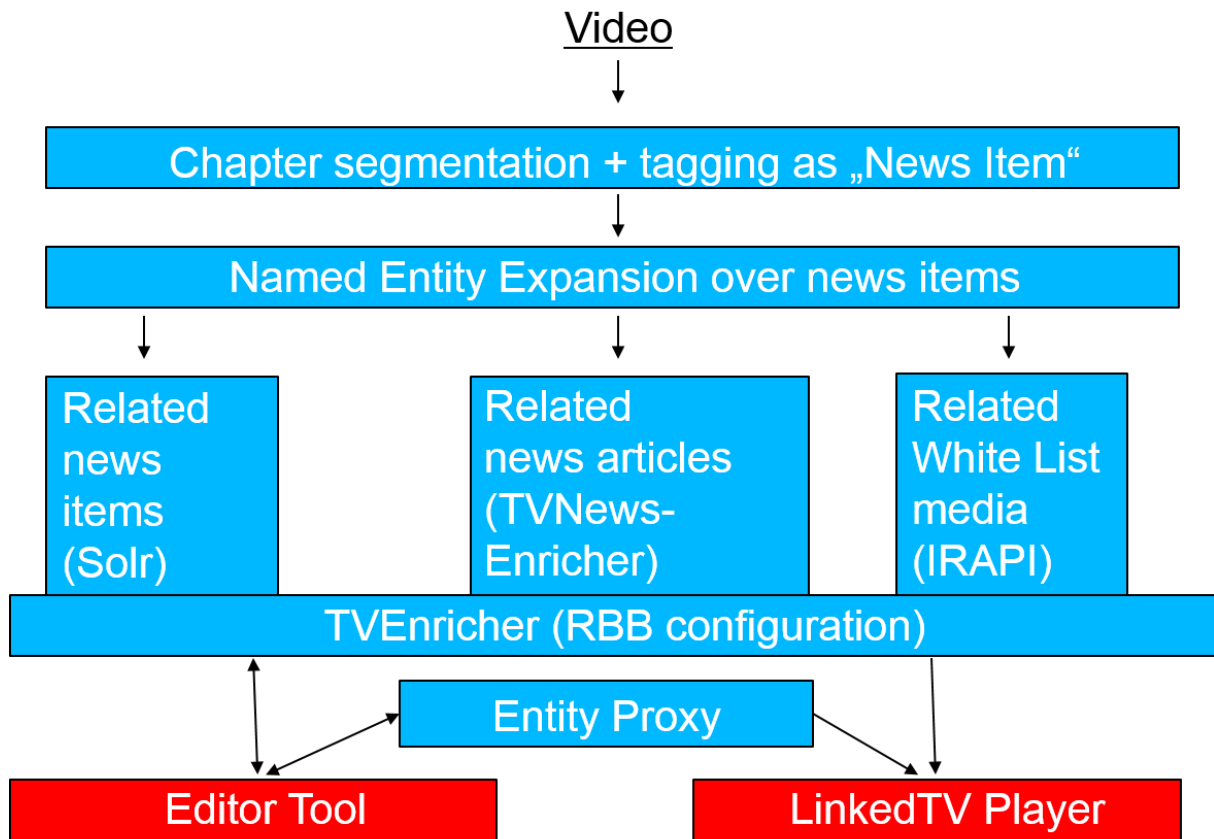


Figure 19: LinkedTV enrichment workflow for the LinkedNews scenario

The main improvements from the LinkedNews scenario perspective were:

- “Bumper detection” (WP1) has been introduced to adapt the video segmentation into chapters to the particular structure of RBB’s news programmes, in particularly to be able to automatically detect the beginnings and endings of news items. Chapters which are news items are tagged as such to guide the subsequent processing.
- Named Entity Expansion (WP2) is a new annotation service implemented specifically for the LinkedNews scenario. It allows us to determine a set of relevant entities for a news item which are not necessarily mentioned explicitly in the news item transcript, as an alternative to the extraction of individual entities from the news item transcript performed by TV2RDF which cannot distinguish which entities are more or less relevant in the news item context.
- Related news items can be found in RBBs archives and suggested as enrichments for any news item using the newly set up Solr index.
- TV News Enricher (WP2) – TVNewsEnricher is a service for enriching news items with online articles and media available in the Web, by searching over RBB white list sites and returning site pages which match the news item topically. It supports link retrieval along different dimensions, e.g.: Timeline, Opinion, In-Depth, based on differing configurations of whitelists and publication dates.

- The crawler module (IRAPI) for the RBB white list of Mediathek sites (video on demand) from German broadcasters' archives has been refined to support extraction of links to embedded media on those sites together with their descriptions, so that the index of available media grows and the relevance of retrieved media is improved.
- The Entity Proxy (introduced in the previous scenario) is configured also to provide related information for concept types typical to the RBB news, e.g. Persons, Places, Organisations.
- The LinkedTV Editor Tool (WP1) has been adapted in a new version to recognise video chapters which are marked as news items. The editor has the chance to check the entities annotating that news item from the Named Entity Expansion service alongside the 'generic' results of entity extraction from TV2RDF. Likewise, the suggested enrichments now come from the news-specific enrichment services mentioned above.

3.4 New LinkedTV player interface

The LinkedNews scenario has been implemented with two approaches to viewer access and interaction with LinkedTV annotations and enrichments:

(1) A companion application: starting with a connected device such as a laptop and tablet, the viewers can choose a news programme and begin to watch as well as browse the annotations and enrichments on the same screen. They also have the option to send the news programme video to an available other screen (e.g. their TV set) and continue to browse the LinkedTV enrichment content on their second screen device synchronized to the news programme. This is an adaptation of last years' LinkedNews tablet interface for use with RBB content and enrichments. In particular, the available navigation for browsing enrichments has been aligned to the dimensions of enrichment supported for the RBB scenario which are related news items from RBB and related news items from other sources;

(2) An HbbTV application: starting with a SmartTV or set top box (STB) with HbbTV functionality, the "red button" mode allows the viewers to access the LinkedTV application and to begin to explore video chapters and their annotations. For annotated concepts, also relevant information for each concept can be displayed on the main screen. Again, if the viewers wish to explore further the LinkedTV enrichments they may connect a second screen to the LinkedTV application which will mirror the list of video chapters and their annotations but offer a more complete browsing of available enrichment links from the LinkedTV system using the LinkedNews interface described above.

The main change in the scenario UI in this year is thus the connection between the TV screen (HbbTV) and the so called second screen – so far the "first screen" used to be PC-based. Based on this and in line with the users' recommendations, the new main screen version also features an on-screen alert, i.e. whenever a new video chapter starts, a pop-up highlights the title of this chapter to the viewer.

3.5 Realisation of the scenario

The user starts the TV set and tunes to RBB. At the bottom right of the TV screen a small alert window appears, reminding the viewer that pushing the red button on the Remote Control (RC) would launch the Start Panel (“Startleiste”), a visual overlay at the bottom of the screen which has a number of widgets. The arrow keys on the RC are used to navigate and select any of the Widgets, pushing the OK button starts the service connected with this Widget.

Pushing OK when the LinkedNews widget is selected, the user will get to a page with

- a list of the available LinkedNews shows and
- a QR code for synchronising the two devices⁵

Pointing the tablet camera with the QR reader at the QR code will combine the two devices and after a few seconds the user gets a notification that s/he can now use the other device with the HbbTV service. This also includes using the companion device (e.g. tablet touchscreen) as a smart remote control for the HbbTV service.

Now the user is free to choose on which screen to interact with LinkedTV enhancements.

On the main screen, remote control interaction is supported (Figure 20):

- **Arrow Up** shows the row of video chapters extracted by LinkedTV which match to distinct news items
 - each chapter is represented by a keyframe from the chapter,
- **Arrow Left** and **Right** can browse the other chapters
 - a bold yellow frame will signal that this chapter is currently in focus
 - below the row of thumbnails the headline of the currently selected chapter is shown
- **OK** to jump to a chapter

⁵ Currently HbbTV does not support a standardised means to connect other devices to a SmartTV via an HbbTV application. This is planned for HbbTV 2.0 which LinkedTV has also provided input to. Once other devices are connected to a LinkedTV service running on HbbTV, the LinkedTV multiscreen toolkit is capable to handle content synchronisation across multiple device screens.



Figure 20 : Select chapter with Arrow buttons and OK on Remote Control

Arrow Up on a chapter will show the available enrichments for that chapter, limited in the main screen to a set of mentioned concepts and their information boxes (name, image, description, a list of properties and values for supported types) which can be browsed by **Arrow Left and Right**. (Figure 21)

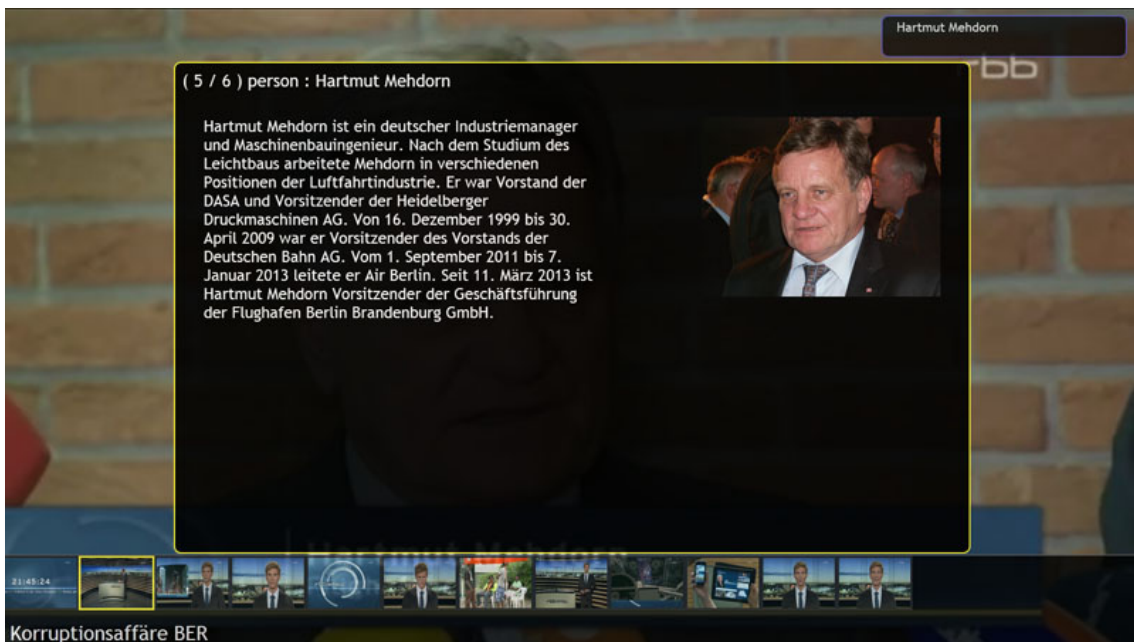


Figure 21: View concept information cards with ARROW UP in a chapter

Once the enrichment view is entered, the TV programme will automatically pause. Arrow Down returns to the row of video chapters and plays again the TV programme.

At the same time, the connected companion screen(s) will remain synchronised with the main TV program so that at any time viewers can also choose to explore the enrichments from their companion device (Figure 22).

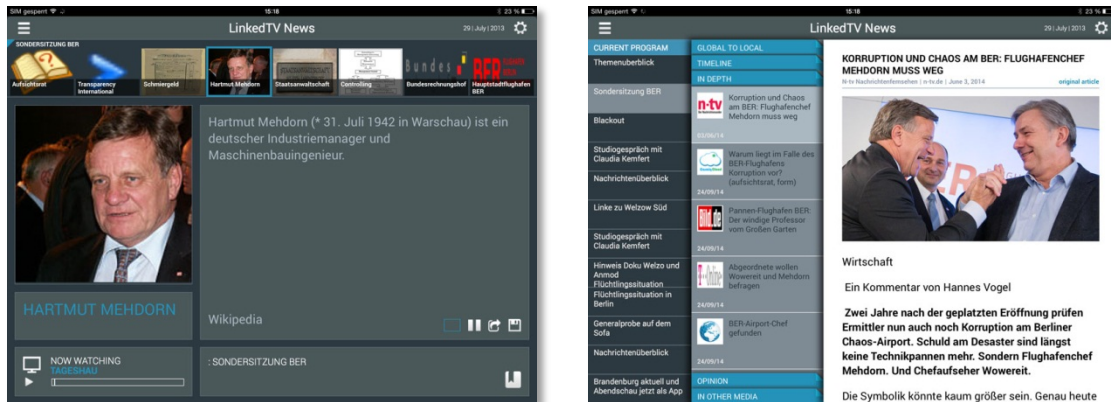


Figure 22: View enrichment in tablet application; left: overview slide; right: in-depth exploration

Here, more detailed enrichment sources are integrated – the related news articles and news media. The companion screen can also pause / play the main TV programme as well as bookmark video chapters for later exploration or share enrichments with other logged in users.

The LinkedNews scenario realisation is also shown by a video recording of the HbbTV application made during the IFA 2014 in Berlin in September 2014, which is shared on Vimeo (<https://vimeo.com/106264077>). This is disseminated by the LinkedTV Social Web channels and on the website.

4 The Media Arts scenarios

The proposed process towards exploring various other opportunities arising from the merger of LinkedTV technologies and media arts is to present demonstrations of current achievement and trigger conceptual ideas from several media artists. Progress in that has been achieved through the organisation of two sessions in conferences, dedicated to artists. The first session took place at the multidisciplinary conference INTETAIN (Mons, Belgium, July 2013) followed by the launch of a public call for proposals for scenarios involving the project technologies used in a “post-TV” context. The second was a special session, Mediadrom, at MultiMedia Modeling (Dublin, Ireland, January 2014) where selected submissions were presented as projects and lines of thought.

After a brief reminder, the following sections describe the current stage of development after nine months of work on scenario experimentation and prototyping. A planning for final integration and evaluations is also proposed for each.

4.1 Selection and development of the arts scenarios

The objective of the call and special session Mediadrom was to attract original contributions by artists with whom we would then be able to experiment and prototype using some of the LinkedTV technologies. Six contributions have been received, two were submitted by artists already presenting at the Intetain 2013 conference. Here is a summary of each of the six submissions, more details can be found in LinkedTV deliverable D6.2.

1. A multimodal and tangible interface for manipulating multimedia content with a use case centered on the June 2013 events in the Gezi Park in Istanbul.
2. An application for exploring artist works sorted by themes, disciplines and genres. It aimed to be installed in media libraries, museums, exhibitions or special events such as performances.
3. A mobile application enabling to generate a report of one’s experience in a city, including video and multiple sensory signals of a day of dawdling in the streets.
4. A research around the authoring of multisensory experiences that merges different art forms (comic strips, video art and soundscapes) in a relaxing space equipped with vibrating mattresses and water displays.
5. A research around interactive content allowing searching and exploring movies information, with a use case dedicated to the genre of fantastic movies.
6. A contribution to research and art related to soundscapes.

From these contributions, the first four were retained for Mediadrom special session, the two others were rejected whether for scientific consideration or for being considered out-of-scope

with respect to interactive media or LinkedTV technologies. From this process emerged the key points to merge artistic projects and LinkedTV technologies with the highest relevance:

- a. The project explores what is beyond television genres.
- b. It uses other forms of content, such as user-generated or crowdsourced content.
- c. It produces content dedicated to personal circles rather than mass consumption.
- d. It explores new forms of interaction capabilities beyond the television set, remote control and second screen
- e. It uses interactive screens dedicated to places outside the living room and in particular places where social interaction happen.
- f. It has a need for multimedia content that artists cannot provide but that can be found on the Internet (enrichment).

After the Mediadrom session and meeting with the artists showing continued interest to push their idea forward, three submissions were selected to be developed as LinkedTV artistic scenarios. These scenarios must be considered as experimental work and their purpose is mainly artistic. LinkedTV technologies are used when they present a real interest and relevance for the scenario, or at least when we think it makes sense to evaluate them in a different context of use. As a consequence, each individual scenario is not a use case for the whole spectrum of LinkedTV developments. The following paragraphs summarize the current status, while more information is provided in the subsequent sections.

Submission 1 has not been much modified and took the name of *Social Documentary*. It starts with the understanding that with the development and the diffusion of new technologies, many events (social, politics, sport, etc.) involve the production of huge amount of multimedia content. Thus, using them as raw material in artistic works is becoming more challenging but more interesting. *Social Documentary* is an installation to display and to interact with big amount of content, mixing videos from different sources, images and texts. The visitor acts in two ways on the content.

Firstly by choosing explicitly keywords related to the video to display. There are 18 keywords, separated in three classes of concepts (people, action, emotion). The visitor selects them by manipulating cubes (one cube per class) on a tangible interface.

In a less explicit way, the visitors modify the probability to display one video segment or another by watching them for a certain period of time, as their gaze is tracked when they interact with the installation. If they are interested in the current video, the system will automatically increase its score and the video will tend to be selected more often when the same combination of keywords is chosen later on. This feature makes use of the Interest Tracker, a software designed for user's behavior analysis (WP4) in the LinkedTV workflow and based on Kinect SDK Face tracking⁶. In the videos provided by the artists, most of the

⁶ <http://msdn.microsoft.com/en-us/library/jj130970.aspx>

speech is in Turkish but there are English subtitles embedded in the frames. We use the optical character recognition (WP1) service provided by Fraunhofer IAIS to extract this text from the frames and a perl module to convert it into subtitle format. This scenario clearly benefits from LinkedTV technologies. More information on the current status, and on the use of enrichments (WP2, not yet leveraged in the current state), is provided in Section 4.2.

Submission 4 has evolved through time to become *Snoezeling*. The original idea has been brought by l'Art-chétype⁷, an association of artists who are working with people from the medical field. Their main goal is to help the patients, and especially the children, to stand their stay in hospital. *Snoezeling* is close to this purpose, it is an installation in a geodesic dome in which a group of 6 to 10 people is invited to create content for and experience an immersive environment. The tour is divided in two parts: the creation of the content and then the visualization. The visual is not intended to tell a story, but rather to propose slowly moving pictures which can be contemplated. The music and vibrating mattresses should enhance the relaxing experience.

The resulting content will always be built on the same structure: a 360° video background on which we put one or two masks (2nd plan and foreground) of geometrical and natural forms pre-created by the artists with alpha channel (transparency) and a background sound track on which we add some sounds related to the video background.

The dome will be installed for the Mons 2015 Capital of Culture events: 6 weeks in the garden of the Museum of Modern Art of Mons, and 6 weeks in the hospital park. *Snoezeling* will be presented 3 or 4 weeks during this period.

This scenario is mainly an artistic experiment which fits with the key points b, c, d and e above. However, the benefit of LinkedTV technologies is not yet demonstrated. In particular, the intended nature of the videos to be displayed, eliciting a relaxed state of mind, make them remote from typical content exhibiting semantics and named entities as in the other scenarios. An evaluation of the analysis and enrichments services with respect to the available content is nevertheless planned. Further development beyond the scope of LinkedTV will be performed with UMONS' own resources. More information on the scheduled developments is provided in Section 4.3. Note that the implementation of this scenario is currently on hold as the priority was allocated to Submissions 1 and 3.

Submission 3 has been revised. After more detailed analysis of the original proposal, we realized that the videos produced by the artists did mostly not fit with the platform analysis tools, and that they would require a lot of manual annotation to achieve the project. Such work was not in accordance with the initial purpose. The artists, Bénédicte and Laure-Anne Jacobs who have created Larbitlab⁸, their own digital art structure, came to us with another

⁷ <http://www.lart-chetype.eu/>

⁸ <http://www.larbitlab.be/>

project. This project is an application already in co-development together with Argus Labs⁹, a company based In Antwerpen, Belgium. It became *TubePlot*.

It is a smartphone application that connects to Facebook user's profile to semi-automatically create personalized stories taking the form of short video episodes. It is then possible to share the videos with Facebook friends and request them to answer three multiple choices questions about the user. Their responses further shape and personalize the scenario of the next episode. The sharing module aims at creating a viral loop over the social network. All the data we use from Facebook to create the videos is approved by the user at login to the application.

Data access, processing and storage are handled by Argus Labs as well as the development of the smartphone application. The artists provided three hours of video license-free to be used in the episodes. These videos have to be sorted by themes and selected in accordance with the user's profile. LinkedTV tools are being used in this context, as the scenario covers needs for both automatic content analysis (WP1) as well as personalization of content selection (WP4). The use and evaluation of enrichments (WP2, beyond the current status of this scenario) is also foreseen. More information is provided in Section 4.4.

4.2 Social Documentary: design and implementation

As previously stated Social Documentary is an interactive and evolved installation to explore multimedia content. A lot of exchange and interaction with the artists led to the current setup. It was part of the original idea that the setup would be easily reproducible for any people who would want to use it. We focused the realization on open source and easy-to-use hardware and software. For convenience, we are detailing the different components of the installation with a step by step use-case example, highlighted in *italic*. Figure 23 presents an illustration of the installation.

Before setting up the installation, we selected the videos and texts (coming from Twitter and containing hashtags as #occupyGezi or #Gezi), segmented the videos and annotated each segment with some keywords divided in three classes: people, action, emotion. The videos we chose are three 3-hours-long mash-up of official TV reports, TV shows and videos shot by the protestors, putting together subjective and different views of the same events. They are downloadable from the Gezi Park Documentary Facebook page¹⁰. The video segmentation and annotation have been done manually. What we call a video segment is a piece of video approximately one minute long and consistent in terms of image and subject. Each segment is assigned a score (as Facebook "likes"), initially equal to one, which will grow during the life of the installation.

⁹ <http://www.arguslabs.com/>

¹⁰ <https://www.facebook.com/notes/gezi-documentary/gezi-park-documentarybelgesel-direct-download-linksindirme-linkleri/592545580813647>

When the visitors enter the installation, they see the main screen on the wall in front of them and a table. There are also three colored cubes on the table, corresponding to three classes of keywords. The table is actually a home-made reactable¹¹ which combines a camera, a diffusing glass and video projector for retro-projection. The cubes are equipped with six augmented reality markers (also called fiducial markers), one on each face, that can be tracked with the camera and reactIVision¹². This open source software offers many features including fiducial identification, orientations and TUIO protocol¹³ for communicating with other software.

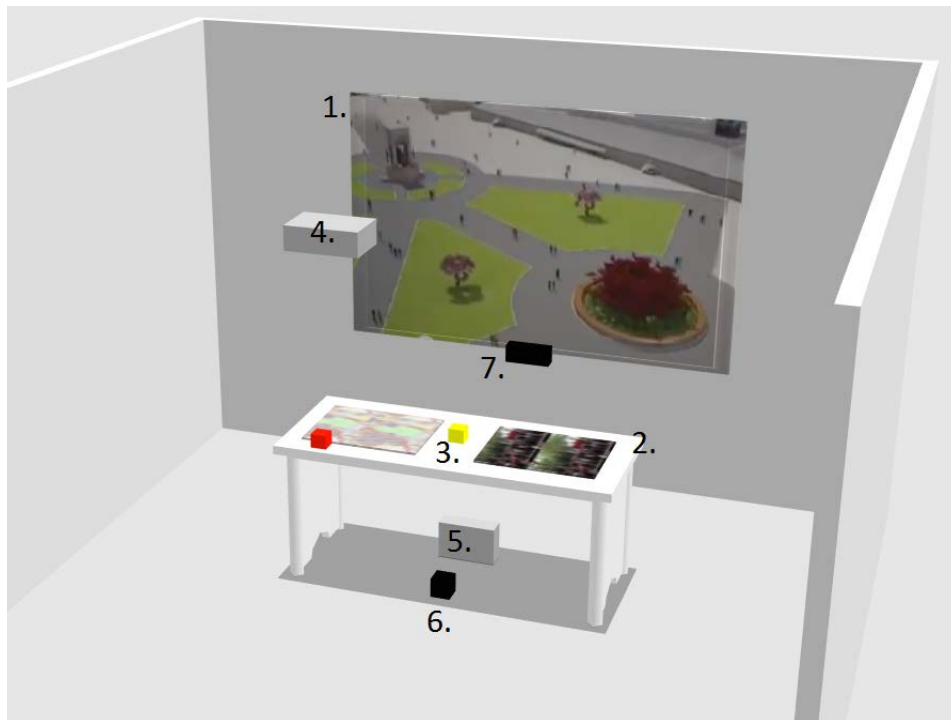


Figure 23: Installation set-up

1. Main screen, displays the video stream; 2. Second screen / Control panel; 3. Augmented reality markers on colored cubes; 4. Main video projector; 5. Second projector; 6. webcam for fiducials tracking; 7. MS Kinect sensor

The visitors select one face for each cube and put them on the table. As each cube is equivalent to a class of six keywords (one per marker), the related keywords are displayed on the table, close to the cubes. A video segment is displayed on the main screen in accordance with the chosen keywords. The player is a custom Java / Processing¹⁴ application that we plan to diffuse as open source software. Processing was chosen because it is a well-known programming language in the world of digital art and it comes with a lot of libraries, especially for TUIO and OSC¹⁵ communication. The player handles the TUIO messages coming from reactIVision and maps the identified markers to the keywords. The

¹¹ <http://www.reactable.com/>

¹² <http://reactivision.sourceforge.net/>

¹³ <http://www.tuio.org/>

¹⁴ <https://www.processing.org/>

¹⁵ <http://opensoundcontrol.org/>

video segments to display are chosen accordingly to their annotations and the probability to display one or another is proportional to its score. Each time a cube is moved, the selected keywords list and segments list are updated. If no keyword has changed when the player reaches the end on the current segment, a new one is chosen with the same principle.

When the visitors are looking at the same area, a text is added to the video. Each time a visitor shows interest for a segment of the video, the rating of this segment is incremented, increasing the probability to display it to the next visitors. When all the visitors are gone, the main screen is shut down but the internal state (score for each segment) is saved. We use the Interest Tracker (see D4.6 for more details) for scene and visitors' behavior analysis. This software communicates with the player through OSC protocol. It gives scene details as number of visitors in the Kinect's field of view, and for up to two visitors, the screen they are watching and the time they spent watching at it. If a visitor spends more than 5.5 seconds looking at the main screen, we consider that he is interested in the projected content and the score of the current segment is increased by one.

This project aims to provide a tangible desktop application to understand, display and interact with a big collection of multimedia content. The installation should be able to adapt itself to the public thanks to attention evaluation and an automatic video rating system. An interesting improvement is to use the table as a real second screen to display pictures and enrichment coming from LinkedTV platform. We will be working on that point in the following months. Three-hours-long video content has been analyzed with the attached subtitles. The table display will be turned into a sleek internet browser-like interface. The enrichments of each segments will be downloaded from the Internet (which also means that we have to filter them and use only license-free content), and displayed as text or image on this interface.

4.3 Snoezeling: design and implementation

As this project is on hold until January 2015, the implementation has not started yet. Nevertheless, the concept and the content have been defined and a schedule has been drawn up.

As described in the section 4.1, the content projected on the dome will be a 360° video background on which we put one or two masks with alpha channel. The video backgrounds will be shot with a special camera for 360° capture¹⁶ in natural environments (beach, forest, mountain, underwater, etc.) and in several weather conditions. The interface for the video edition will be the same as for *Social Documentary*, a table with marker tracking and the possibility to display content on it. This part will be re-using the implementation and software developed for the previous project. As in *Social Documentary*, the groups of visitors will be invited to move and turn cubes on the reactable to select five parameters:

1. Video background place: beach, mountain, forest, etc.
2. Video background weather: sunny, cloudy, snow, rain, etc.

¹⁶ <http://www.giroptic.com/>

3. Foreground mask: natural forms
4. 2nd Plan: nothing or natural forms or geometrical forms reminding human-made structures
5. Soundtrack background

Media enrichment can meet an interesting purpose here. Visitors will be helped in their choice not by words or the visuals which compose the projected video but by the enrichments on these visuals. These enrichments can be considered as a kind of clue for the visitors and give them an idea of what they will see without revealing the actual video until the projection starts. For example, if the visitors have chosen a forest under the rain as background, the enrichment can be a picture of Amazonian forest, whereas the real video background will represent a forest from northern Europa. Once their choice is clear, they can push on a 'start' button and they have 30 seconds to take a mattress before the projection starts. The projection lasts between 2 and 5 minutes, if they all agree to cut it after 2 minutes, they can pick up new values for the parameters and start a new projection.

As already mentioned, the implementation of this scenario is currently on hold. An evaluation of the analysis and enrichment services with respect to the available content is planned. Given the nature of the content itself, quite remote from the other use cases semantically-related content, returned results may not be relevant for the sought purpose. In that case, the collaboration between the artists and LinkedTV will come to an end. If not, we plan to upload the videos for analysis and enrichment during October 2014. The months of November and December will be dedicated to the creation of the masks with the alpha channel. The first test on video creation will occur in January. The physical part will be dealt with later. The reactable will be built in January and the dome in March.

4.4 TubePlot: design and implementation

ArgusLabs has already released a beta version of the application. They provide an API that analyzes the user's Facebook profile and stores the demographics information (gender, age, city of residence, relationship status, etc.) about the user into an available structure. Tube Plot API also supports the episode building and rendering. The presentation video is available on the artists' website¹⁷. This beta version does not include the LinkedTV part.

Once collected from Facebook, the data is processed by the argus platform and is made available in an easy accessible format to the episode builder. This allows the episode builder to work on data that does not fail by downtime of external servers, unavailable data, heavy data calculations and allows to focus on building the episode. The raw data is stored in the Argus serving databases with time information to make sure changes can be tracked over time. The application sends the user location and a profile picture taken with the front camera of the phone at the time of registration, to use this information in the first episode. The artists provide a set of typical scripts (storylines and videos) for eight types of profiles, with blanks

¹⁷ <https://tubepplot.net/>

and placeholders that will be filled with personalized content coming from the web. Data analysis allows matching the user with one of the pre-established profiles, determining which plot will be used for this user.

Episodes are the core of tubeplot. The episode builder is the component that combines all logic and has the following responsibilities:

1. Have data available to be used in scripts.
2. Apply translation to the data into the local language.
3. Pick the right script using the multicondition script logic module.
4. Replace all variables in the script with user data.
5. Produce a script that can be played back by any mobile client.

All the tools described until now are provided by ArgusLab. LinkedTV tools are very interesting to obtain the most relevant and personalized pictures and video segments to fill the gaps in the script. We intend to upload, analyze and get enrichment for three hours of video on the LinkedTV platform. These videos are provided by the artists and are mainly composed of old movie and advertisement extracts, which are now part of the public domain. They have the advantage of carrying a lot of concepts which can be detected by analysis tools. When the user first logs in TubePlot, ArgusLabs API analyzes the Facebook profiles and matches it with one of the eight pre-established profiles. The profile data structure and the script of the current episode will be used to generate a LinkedTV profile. With the LinkedTV recommendation system, some of the videos provided by the artists will be judged more relevant than the others. We propose to use these videos and their enrichments to fill in the blanks intentionally left open in the episode template. Then, the filtered media content will be downloaded by the ArgusLabs server to be merged into the episode video. The aim is to be able to generate real different and personalized episodes in terms of video content. In that context, the interest of the technologies is in finding more relevant enrichments and automating the process of automatically filling gaps in the scenario template. The end-product is a mash-up of video content and enrichments rather than an additional enrichment stream on top of a pre-edited content.

We think LinkedTV tools are appropriate for these tasks, and we plan to run tests in three phases.

- Manually create a LinkedTV profile based on the data we have from the TubePlot API, with the tools from CERTH¹⁸
- Get back the video fragments recommended by the platform and their enrichments
- Download the videos and pictures and integrate them to the TubePlot episode

The test phase will go from September to October 2014. We will then develop two tools during the following three months. The first tool will convert user's Facebook data to LinkedTV user profile, using the LUMO wrapper. The second tool will get back the filtered enrichments and send the corresponding URL to the ArgusLab server which produces the

¹⁸ <http://multimedia.iti.gr:8080/reasoner/index.jsp>

episodes. These tools will be developed by UMONS in accordance with other partners. We can expect the enrichment to be relevant enough to be used in the episode with little human intervention. If so, the project will give a working prototype.

4.5 Scenario demonstrators

Until today, one scenario has been successfully completed, Social Documentary. The installation has met a public of approximately twenty people during a three-hours-long event organized in Istanbul on August 23, 2014. This demonstration was the objective of a one-week workshop with two of the artists who have collaborated the most on the project: Ceren Kayalar and Sema Alaçam. Besides, both of them are currently completing a PhD in research fields which are close to this project: human-computer interaction and gesture analysis. The workshop and the event have been hosted at BüyükAyi¹⁹, an atelier which supports and produces digital art projects (Figure 24).

The set-up we settled at the end of the workshop, and that we presented to the public differs from part 4.2 on a few points:

- The table used as second screen and control panel was lent by the owner of BüyükAyi atelier; its size is about 70 cm by 40 cm, less than initially intended. It used to be a simple touch table and required improvement to fit our needs. We spent more than two days to get it operate satisfactorily, by trying different configurations. We finally opted for infrared lights and filter on the camera, and added tracing paper on the glass for better retro-projection.
- The visuals on the table are neither videos nor a map, only circles surrounding the cubes when they are put on the table. The keyword associated to the identified marker is shown on this circle.
- The collection of colored objects has been replaced by three cubes corresponding to the three classes of keywords. They are made in white plastic and can be colored by displaying a circle under them, on the table display.
- The keyword set has been modified after a consultation with the artists to adapt the best to the video chosen for the demonstration. The new keywords are detailed by classes in the following table.

People	Action	Emotion
Police	Speaking	Fear
Protesters	Shouting	Happiness
Politics	Striking	Calmness
Medical	Singing	Anger

¹⁹ <http://www.buyukayi.com/>

People	Action	Emotion
Artist	Running	Pride
Striker	Chocking	Pain

- The video annotation has been done manually with a subtitle editor software on 1h40 of videos, which represents 122 segments. All the annotation work has been accomplished by the same person to avoid incoherence; nevertheless manual annotation remains deeply subjective. The segments are shorter than the ones used in an early prototype version.

The whole installation needs four software parts communicating through OSC so we decided to separate the software on two computers; one for the main display (Player) and for the visitor tracking, while the other computer run the reactIVision software and the table display. We have not noticed problems during the three hours the installation was operating.



Figure 24: Public installation of Social Documentary

To bring more people, the artists launched a Facebook event for the demonstration advertising and invitations, with the poster presented in Figure 25. Thereby, most of the visitors were people they already knew, with a high education level (Master or PhD). Nevertheless, some other people who were walking in the street also came into the place, used the installation and expressed a particular interest for the project and its political significance.

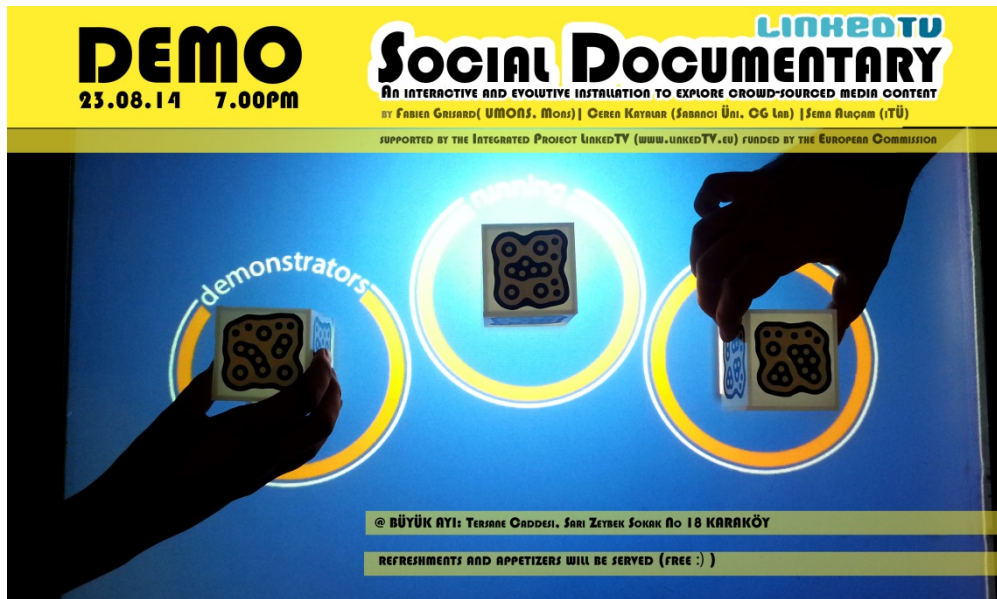


Figure 25: Poster posted on social networks to advertise for the demonstration event (by Sema Alaçam)

After this event, some problems were pointed out by the visitors and the artists, sometimes followed by ideas for a solution. The main problem is the fast convergence toward a small collection of segments. In fact, after about two hours, the segments which were initially chosen at random have a greater score than the others because the visitors have spent some time watching them, increasing their score and also their probability to be displayed to the next visitors. This is due to the rating system which is only based on time spent watching the video segment and which can only increase the score. A solution proposed by the artists would be to replace this implicit system by explicit gestures, so that the visitors would *choose* which segments they recommend and which segment they advise to avoid. These gestures could be a thumb up or down. A visitor (PhD student in Mathematics) also highlighted that the relevance of the segment would be much higher if there was a way to define the “quantity” of features in the segment. For example: 5/10 of *politics*, 2/10 of *anger* and 8/10 of *calmness*. The visitors would choose this quantity by turning the cubes on the table and would see a gauge fluctuating around the cube. This is feasible but requires much more accurate annotations on the segments, which would demand more resources than are available on this scenario.

Dissemination

Before this implementation of the installation another early prototype has been realized at UMONS and presented as a poster at the Workshop on Interactive Content Consumption (WSICC) at the conference TVX2014 in Newcastle. A demonstration video is posted on the LinkedTV website and on YouTube²⁰.

The artists plan to apply to some conferences in human-computer interaction and to show the demo or at least present the concept and the help of LinkedTV technologies during the

²⁰ https://www.youtube.com/watch?v=INN9Bes0NWc&list=UUS345RV7_b21E0ZWkJff8Uw

development phase. As they are quite busy by now, they aim for conferences with deadlines after January 2015. The three target conferences are:

- TEI 2016²¹: International Conference of Tangible Embedded and Embodied Interaction (Abstract Deadline: Likely 2015 August)
- eCAADe 2015²²: Education and Research in Computer Aided Architectural Design in Europe Conference (Abstract Deadline: January 2015)
- CAAD Futures 2015²³: The Next City (Abstract Deadline: October 2014; Full Paper Deadline: February 2015)

Furthermore, in Spring semester (2015) Sema Alaçam will open a MSc course titled: "Interaction Tools and Environments in Digital Design" at Istanbul Technology University (ITU). She will present some topics in the schedule like: "Gesture Based Interaction Environments", "Interaction with/in the Space, Spatiality of Interaction". In this case, the setup might be appropriate for the student homeworks / projects and might find new purpose with different seed content.

The installation and demonstration to a public were great steps in the development of the project. However, they do not represent an endpoint, but a milestone. The project must continue to be promoted and developed, starting with implementing the improvement exposed in this document. It will have the opportunity to progress in the following months and even after the end of LinkedTV project.

²¹ <http://www.tei-conf.org/15/call-for-proposals-to-host-tei-2016/>

²² <http://www.ecaade.org/conference/future-conferences>

²³ <http://www.caadfutures.org/>

5 Conclusions

This deliverable reported on the progress in the LinkedTV scenarios at the end of the project's third year. The scenarios have been realized on a new generation of LinkedTV software and services delivered by the technical work packages during the year. The resulting LinkedNews and LinkedCulture applications were demoed at IFA and IBC industry events and were highly instrumental in demonstrating the meaning and value of Linked Television to visitors. For further dissemination they have been used to create updated scenario videos which are hosted on Vimeo, embedded in the demo pages of the LinkedTV webpage and used in dissemination by news item (RSS), Twitter and LinkedIn. They are also used in the LinkedTV Public Showcases page (see deliverable 7.6 LinkedTV Public Demonstrator).

The media arts scenarios have been an additional opportunity to explore ideas around interactive and enriched media content outside of the 'classical' use cases for the European broadcasters. We are exploring here additional, futuristic forms of multimodal media interaction, integration and remixing which do not fit to today's broadcast TV environment. This allowed us as a project to explore together with media artists – who think outside of the box of the broadcast industry – if and when LinkedTV technology can fit (or not) more innovative and exploratory media scenarios.

In the scenarios activity, we will turn our focus now to the final user trials to validate these final scenario realisations with RBB and TKK viewers. This activity will also be important in collaboration with the sustainability and exploitation work, since the usefulness and usability of the applications are critical to win consumer interest and hence form a viable business model for the broadcasters who would need to invest in applying the LinkedTV solution.