



LINKEDTV



Deliverable 6.2 Scenario Demonstrators

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1 LinkedTV: Scenarios for future linked television

This deliverable reports on the demonstrators prepared using the LinkedTV technologies for the two principle scenarios: Interactive News (partner: RBB) and the Hyperlinked Documentary Scenario (partner: Sound and Vision). Complementing the working demos, we report on the user trials performed with the first year scenarios, the resulting revisions made, and the progress in our third scenario, Media Arts (partner: University of Mons).

1.1 History of the document

Date	Version	Name	Comment
09.08.13	V0.1	Lyndon Nixon	Created initial structure
14.08.13	V0.2	Lyndon Nixon	Sent around skeleton for partner input
14.08.13	V0.3	Jana Ebermann	Update to Section 2 User Trials
11.09.13	V0.4	Erwin Verbruggen	Added <i>User trials at Sound and Vision</i> to Section 2 User Trials and <i>Sound and Vision Scenario</i> to Section 3 Revised Scenarios
20.09.13	V0.5	Nicolas Patz	Added <i>RBB Scenario</i> to Section 3 Revised Scenarios
24.09.13	V0.6	Michiel Hildebrand, Stephane Dupont	Added <i>User trials at CWI</i> to Section 2 User Trials and <i>U Mons Scenario</i> to Section 3 Revised Scenarios
25.09.13	V0.75	Lyndon Nixon	Formatted the complete document, completed introduction and conclusions
26.09.13	V0.8	Michiel Hildebrand, Lotte Baltussen	Include results for Sound and Vision focus group.
03.10.13	V0.85	Lyndon Nixon	Post QA corrections
08.10.13	V0.9	Veselina Milanova, Nicolas Patz, Stephane Dupont	Revised inputs by partners according to the QA
11.10.13	V0.95	Lyndon Nixon, Erwin Verbruggen, Jaap Blom	Updated Sound and Vision scenario with details to its realisation, evaluation and demonstrator

Date	Version	Name	Comment
21.10.13	V1.0	Lyndon Nixon, Lotte Baltussen, Nico Patz	Last updates on scenario demonstrators and evaluations
23.10.13	V1.1	Lyndon Nixon, Lotte Baltussen, Nico Patz	Edits according to 2 nd QA

1.2 Glossary for the document

Certain terms are used with specific meanings within the LinkedTV world. As these terms are also used throughout this deliverable, we provide for the reader's convenience a short glossary.

Seed (video) content the video content which is the subject of annotation and enrichment in the LinkedTV infrastructure. (to distinguish from video which may be part of the enrichment itself)

Enrichment links to other content which are associated to fragments of the seed video, based on the topics within that video fragment which have been identified through annotation.

Enrichment content the media resources linked to in the enrichment, which can be browsed to from the video within the LinkedTV system.

2 User trials

Several user trials were conducted in the 2nd year of LinkedTV using the scenario descriptions and initial mock-ups as a basis to evaluate at an early stage consumer and market interest in LinkedTV. University of St Gallen trailed the scenarios with industry experts in terms of evaluating the potential user market, while Sound and Vision and CWI (on behalf of RBB) ran participatory trials with “scenario-typical” viewers to gain insight into the expectations of 'normal people' vis a vis the LinkedTV experience.

2.1 User trials at University of St Gallen

The University of St Gallen internal trials were conducted to evaluate the LinkedTV concept and scenarios against current trends in the TV market. The goals of the trials were to explore technical developments as well as the innovations and changing user habits of TV usage. Additionally the evaluation considered specific and more detailed questions relevant for other WPs of the project including concepts like licensing, enrichment, video analysis, recommendations, curation, ethics, law and privacy.

2.1.1 Methodology

The participants of the trials were experts that have been suggested by project partners. They are not involved in the LinkedTV project but are familiar with the TV market and know about current and future developments in the TV industry. We focused on technical experts as well as on experts with application or user oriented priorities.

After conducting a framework of relevant themes and questions for a semi-structured approach: telephone interviews with 11 experts were held (the questionnaire is included in Appendix A). In a first part of the interviews the experts talked about major trends of the TV market. Afterwards they watched the first year demo videos of the RBB scenario and the Sound and Vision scenario in order to answer more concrete questions at the end of the interview. With the permission of the experts all interviews were recorded and transcribed.

The analysis of the interview texts was performed with the data analysis software Atlas.ti. Each answer of each expert was tagged with individual combination of codes. Three different coding patterns existed.

- 1.) First of all there were topic related codes. They summarized the main topic the person was talking about in a paragraph. These codes were extracted from the questionnaire patterns and a paraphrasing while coding. The topic related codes enabled us to identify the most relevant issues in the interviews.
- 2.) Secondly evaluations by experts were tagged. Additionally to the main topic in each paragraph, the evaluation codes tagged an issue as a challenge, as a recommendation or as neutral or positive. The evaluation of each topic allows finding

out which topic is mentioned in a mainly positive context, which is primarily connected with problems or challenges or which topic included recommendations of the experts.

- 3.) The last coding category differentiated between a topic related to a general trend or the LinkedTV scenario. This coding pattern enables classifying issues related to general trends or concrete LinkedTV scenarios.

After completing the first steps of the analysis, all codes have been checked for duplicates and have been summarized in more abstract categories in order to help getting an overview. Cross tables and counts completed the analysis and enabled us to meet the goals of the internal trials.

2.1.2 Results

2.1.2.1 General Trends

Most experts mentioned second screen and social media applications in TV as very important overall trends (cf. Table 1: General Trends). In detail they suggested opportunities of second screen regarding advertisement or social situations, where second screen can be used as a personal device. Challenges are synchronisation of second screen and TV or multitasking abilities of the users. Often social media and second screen are mentioned as combinations. TV as a social experience is often associated with sharing and commenting content, therefore many experts emphasized the importance of social media in this context. Furthermore enrichment is seen as a crucial trend but often associated with challenges like the users lean back situation while watching TV in contrast to an active search for additional content. The most challenging topic the experts mentioned were HBBTV standards and the usability or navigation on the TV.

Trend	Description	Quotation Count per Evaluation	Quotes/ Experts
Second Screen	TV = lean back, second screen is an active decision of users + Interface advantages	Problems/challenges: 5 Neutral/positive: 13 Recommendations: 5	23 Quotes from 9 different experts
Social Media	TV as a social experience, need for sharing and discussing content	Problems/challenges: 6 Neutral/positive: 10 Recommendations: 3	19 Quotes from 8 different experts
HBBTV, Web in TV	HBBTV and WebTV are rather controversially discussed	Problems/challenges: 7 Neutral/positive: 1	8 Quotes from 4 different experts
Enrichment	Enriched content with additional infos, links, annotations	Problems/challenges: 2 Neutral/positive: 3	5 Quotes from 4 different experts

Trend	Description	Quotation Count per Evaluation	Quotes/ Experts
Usability & User interface	Difficult navigation of complex content via remote control, recommended simplicity	Problems/challenges: 5 Recommendations: 1	6 Quotes from 3 different experts
Advertisement	Users accept advertisement, when it is transparent and not harming privacy issues	Neutral/positive: 3 Recommendations: 1	4 Quotes from 2 different experts

Table 1: General Trends

2.1.2.2 Overall evaluation of the LinkedTV concept

Similar issues as discussed in the general trends came up in the evaluation of LinkedTV scenarios (cf. Table 2: Evaluation of LinkedTV Senarios). Second screen for example is mostly recommended for better usability. However, in context with enrichment more concrete advices were mentioned. Experts suggested that additional information must be more compact, curated and able to be bookmarked to look it up at the end of a video or scene. Curated annotations are mostly recommended unless the business model would be to sell an automatic tool. In the context of annotations crowd sourcing was suggested as an approach between curation and automatic annotation.

Personalization was discussed controversial because of privacy and data abuse issues. It could help to provide users only information they are interested in, but often people are worried if a system tracks their behavior. Therefore a transparency and an opt-in opt-out possibility must exist.

Trend	Description	Quotation Count per Evaluation	Quotes/Expert
Additional Information	Which Information should be included? When should it be included? Legal issues of the material	Problems/challenges: 14 Recommendations: 27 Neutral/positive: 5	46 Quotes from 11 different experts
Second Screen	TV = lean back, second screen is an active decision of users, Interface advantages, synchronization challenges	Problems/challenges: 11 Recommendations: 28 Neutral/positive: 6	45 Quotes from 10 different experts
Annotation	Automatic vs. Curated, level of detail in annotations, technical issues	Problems/challenges: 11 Recommendations: 24 Neutral/positive: 8	43 Quotes from 11 different experts

Trend	Description	Quotation Count per Evaluation	Quotes/Expert
User interface	Simplicity and high usability of the interface is recommended, Challenges of a single screen solution	Problems/challenges: 19 Recommendations: 20 Neutral/positive: 1	40 Quotes from 10 different experts
Personalization, Recommendation	Should enriched content be personalized and special topics recommended to users?	Problems/challenges: 7 Recommendations: 31 Neutral/positive: 2	40 Quotes from 9 different experts
Show format	Which format would be best? Advantages, disadvantages	Problems/challenges: 4 Recommendations: 17 Neutral/positive: 5	26 Quotes from 11 different experts
Transparency, Privacy	Data abuse, trust of the user, transparency regarding collected data, privacy issues	Problems/challenges: 6 Recommendations: 11 Neutral/positive: 1	18 Quotes from 8 different experts
Pausing	Issues of pausing the video to read text, disruptive TV experience	Problems/challenges: 11 Recommendations: 2 Neutral/positive: 1	14 Quotes from 5 different experts
TV experience	TV experience compared to LinkedTV approach: Lean back, looking for entertainment or infotainment	Problems/challenges: 8 Recommendations: 2 Neutral/positive: 1	11 Quotes from 7 different experts

Table 2: Evaluation of LinkedTV Senarios

Possible formats of an enriched TV show were discussed as well. News and reports are informative formats that are conform with the aim of LinkedTV but they could lead to information overload (cf. Table 3: Recommended Show Formats).

	Pro (count)	Contra
News	7	Too much information for small amount of time (1)
Reports, documentary	6	Destroying atmosphere (1)
Guides	1	
Sports	3	Not enough dynamic (1)

	Pro (count)	Contra
Debates	1	
Cooking shows	1	
Entertainment	Movies(1), series (1), gossip(1)	
Art	1	No practical use (1)
Every kind of program	1	

Table 3: Recommended Show Formats

2.1.2.3 Evaluation of the scenarios against current trends in the TV market

Some experts gave business advices for LinkedTV as well. They suggested that LinkedTV needs to focus on the proposed value and differentiate what the project wants to provide whom to sell LinkedTV afterwards. A business case was recommended to solve a real problem and to be able to explain the added value for the buyers. Depending on the case different contact persons will be relevant; 4 options were discussed:

- a) An automatic production of the LinkedTV format with a graphic overlay, that is easy to use
- b) Provide enriched versions on the video, on demand for network operators¹
- c) A service based cross media approach for TV show producer (it was recommended not to sell the technology, they won't buy it and won't pay for permanent infrastructure)
- d) Selling the product directly to the final user per monthly rate

But in order to sell LinkedTV the demos must be adapted. They must be less complicated and more attractive to the target group.

The last point the experts discussed was related to the licensing of LinkedTV. A modular licensing with inter-connectable components was often recommended. A transparent business model, licensing model and pricing model will be needed and a consortium agreement on one licensing model was pointed out to be very important.

¹ This point is controversial: another expert mentioned network operators do not buy solutions from small companies in general

Trend	Description	Quotation Count per Evaluation	Quotes/Expert
Selling advices	Contact persons, market details, necessary improvements regarding product and demo for selling	Problems/challenges: 10 Recommendations: 27 Neutral/positive: 5	42 Quotes from 8 different experts
Licensing	Modular vs. End-to-End, Agreements	Problems/challenges: 5 Recommendations: 15	20 Quotes from 7 different experts

Table 4: Business advices regarding the scenarios

The results obtained in this user trial have an impact on different work packages within the project. The results were communicated to and discussed with all partners during a project meeting in March 2013. The evaluation results of LinkedTV scenarios and concept have been incorporated as a baseline in D3.5 where we take a deep dive into user requirements and solutions for the posed challenges for LinkedTV in a news format context (usability issues, concrete features, etc.). Furthermore, the here presented results delivered input for the revision of the LinkedTV scenarios presented in Chapter 3. The business advices related to licensing, customer group, and provided value have been partially incorporated in D8.5 and will be further used as input for the upcoming business-related tasks and deliverables.

2.2 User Trials at Sound and Vision

Together with CWI and Noterik, Sound and Vision developed a focus group in order to gather input for formulating a concept design (high-level functionalities, information sources and a realistic 2nd screen scenario) around the *Tussen Kunst & Kitsch* (from here on TKK) programme from Dutch broadcaster AVRO. Interested persons were asked to fill out a form to indicate their availability and give some general information about their digital literacy, second screen use and interest in TKK. Participants were recruited through the AVRO TKK website, the Sound and Vision R&D department blog, Twitter and the AVRO Culture newsletter. Within a week, 18 interested persons had signed up, of which 8 persons were consulted for participation. Half of the participants was male, the other 4 female. Their average age was 62 - a relatively skewed group age-wise. Younger participants also signed up, but both dropped out the day before, since they were ill. The group is representative of TKK viewers but for future trials, we hope to be able to lower the age average of the participants.

2.2.1 Focus group setup

The focus group was held in a meeting room at Sound and Vision and lasted two hours. Three LinkedTV consortium members were present:

- Lotte Belice Baltussen (S&V) - moderator. Task: keep track of the script/protocol and the time.
- Mieke Leysen (CWI) - focus group assistant. Task: write down and score remarks made for each assignment and discussion.
- Erwin Verbruggen (S&V) - assistant. Task: writing down the most salient remarks, including the time-code of when it was made. Making photos (without showing participants' faces).

The following protocol/script was followed:

Welcome, reception, intro round and filling out consent form. (10 min)

The moderator explained the goal of the workshop and how the feedback would be registered: audio recording, photos, written report. It was explicitly mentioned that everything would be completely anonymized! If anyone did not want to be recorded or photographed, they could refuse to take part. After this was explained, all participants filled out the consent forms and signed them.

Introduction (15 min)

The moderator gave a general intro on the research done for LinkedTV and the reason for holding the focus group, namely gathering feedback in order to update the scenarios and requirements, with a focus on second screen requirements. After this, the structure of the focus group was explained.

Profiling the users, introducing scenario (30 min)

The users were asked to discuss why they watch TKK. Then, they were asked if they already use a 2nd screen device while watching TKK or other shows, and if so, what kind of activities they use it for. Questions asked were:

- What extra info would you like to find on a TKK 2nd screen?
- Which (art) sources do you use online?
- Do you or would you like to interact with others during the programme and express your opinions?

Video & additional information exercise (25-30 min)

Participants were asked to watch 4 chapters of TKK - which were projected on the wall of the room - and were asked to pick a device (laptop, tablet, smartphone) they would most likely use during or after the show to look for additional information, or to indicate if they would like to be able to do with the video besides looking for information (e.g. bookmark it, interact with others through social media, share the device with a fellow viewer, something completely different). They wrote these remarks on a sheet of paper on which their device of preference was printed (laptop, tablet, smartphone). They could either chose the same device for each chapter, or switch if they preferred that.

The 4 TKK chapters were:

- an introduction of an episode in which host Nelleke van der Krogt talks about the location recording (in this case the Hermitage Amsterdam)
- a 4.5-minute chapter on a gold watch
- a 1.5-minute chapter on a textile sample book
- a 4.5-minute chapter on a painting by Jan Sluijters

The reason these four chapters were selected were two-fold. The Hermitage and Jan Sluijters chapters were featured in the scenarios and demo of year one. We wanted to find out whether our assumptions about the types of enrichments created for these chapters for the scenarios and demo made sense or not. On the other hand, the gold watch and textile sample book were completely new and could provide more fresh insights. Also, we wanted to find out whether the longer chapters about more valuable items interested users more than shorter ones about less valuable/interesting objects.

Discussion (25-30 min)

After the participants individually did the video and additional information exercise, their feedback to the video & additional information exercise related to the four chapters were discussed in plenary. The participants gave specific feedback on which things in the four chapters (e.g. objects, art styles, experts, locations) they wanted to know more about and why, and how and when they would find this information.

Showing 2nd screen demo by Noterik & plenary feedback (15 min)

The previous exercises and discussions were followed by showing the participants the work-in-progress of the second-screen demo that Noterik had developed at that time. The demo contained an example video (the film “Everything is a remix”) and did not contain any TKK data, since not enough information had been processed within the LinkedTV project at that point. The Noterik demo served as a conceptual presentation of a possible second-screen demo, and participants were asked to think about how it could be adapted for LinkedTV, and which functionalities they liked, didn’t like, and which ones they would like to add. The workshop moderator and assistant also guided them through the demo and gave examples of how the second screen could work for TKK, e.g. it could present layers of additional information sources on persons, like creators and experts.

In this demo, the concepts in the av-material on the main screen (in this example William Burroughs) are shown in various information layers on the second screen - in this case the songs heard, persons mentioned or shown and a timeline. Furthermore, the demo shows how concepts and its related information sources in these layers can be bookmarked to consult later, how information related to a concept is presented, and other features.

End of workshop / goodbye (5 min)

The focus group was concluded by having the participants fill out a short questionnaire on online sources they like to use to find out more about art history, and general conclusions and remarks about the focus group. Participants were thanked and presented with a thank you gift and the future contact consent form and the final questionnaire form.

2.2.2 General participant information

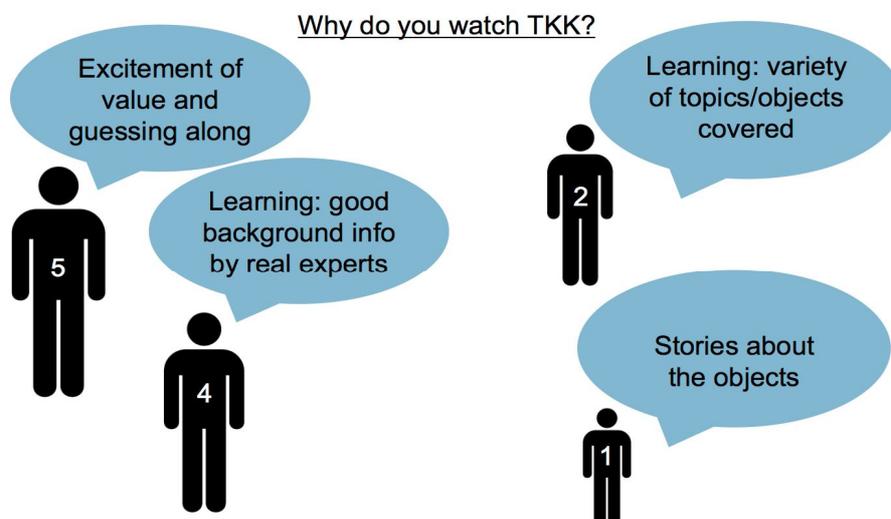
In total, there were 8 participants: four women between the ages of 54-66 and four men between 60-67. Six people came by themselves, but one married couple also took part. Three participants were retired, the others still worked as a: juriconsult, information worker at a library, municipal council worker, activity-coordinator and as an independent video producer and editor. All people that took part were originally from and living in the Netherlands.

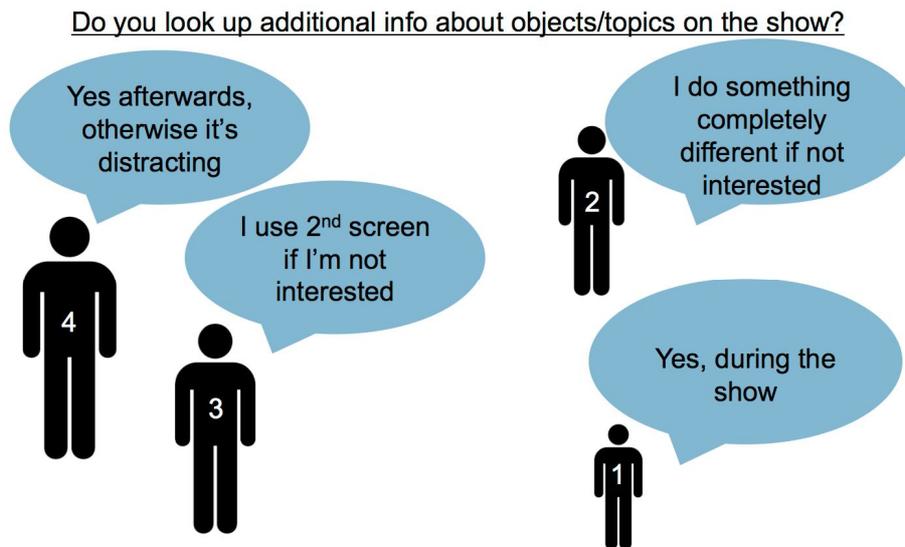
This is a relatively skewed group age-wise. Younger participants also signed up, but both dropped out the day before, since they were ill. The group is however representative of TKK viewers.

Only one person considered themselves not very active, four said they were an average digitally active person and three stated they were very active. All in all, the participants were pretty digitally literate and do not have problems with using computers and the internet to find information.

2.2.3 Viewing habits

Five out of eight participants stated that one of the things they enjoy most about the show is guessing what the value of an object will be and the excitement when it is revealed. Furthermore, four said that another important reason for watching is that the information given by the experts about the objects, and learning more about art history as a result. Another reason mentioned by two people was the variety of the topics and types of objects covered.





Most of the participants use or would use a laptop as a second screen to look up extra information related to the show. This is in contrast to the outcomes of a large survey held amongst 1,300 Dutch television viewers by SKO in 2011, the Dutch organisation that collects television viewing data. According to this survey, 77% of people over 50 that used a second screen device while watching television use a tablet. However, they mostly use it to do things that are not related to the programme they're watching, such as emailing, surfing, online banking and other internet-related activities.² This does not correspond to the viewing habits of the TKK focus group participants - only 1 out of 8 used his/her laptop during the programme on a regular basis to go online and do things that were unrelated to the programme.

2.2.4 Second screen preferences

While watching *Tussen Kunst & Kitsch*, three people use a second screen (in all cases a laptop, in only one case on a regular basis) to do something different if a topic doesn't interest them. Two participants do something that is not screen-related at all when this happens, for instance reading or making coffee. Four people actually use a second screen (in three cases a PC or laptop, in one a tablet) to look up information related to objects presented on the show, but only after the show is over. They state that it is much too distracting to do so while they're watching and that they don't want to miss anything. Only one person actually uses a second screen (a laptop) during the show to look up additional information. This corresponds with the findings from a 2012 study by Deloitte on the UK television market, in which they interviewed market experts and a survey was carried out amongst 4,000 people. The report states that "second screening does not need to be simultaneous" and that content that requires people's attention will result in people finding

² SPOT TV Jaarrapport 2012. Anyplace, Anytime, Always On. SPOT TV Jaarrapport. Amstelveen: SPOT, March 7, 2013.
http://spot.nl/docs/default-source/jaarrapporten/spot-tv-jaarrapportage2012_binnenwerk_licht.pdf

out more about the programme when it's over.³ This assertion very much corresponded to the second screen preferences of the focus group participants.

2.2.5 Online sources used for art info

The participants use the following online sources to find more information about the TKK subjects that interest them:

- Google: 7
- Wikipedia: 4
- Museum websites: 2
- AVRO website: 1 (to find expert bio/info)
- Internet Movie Database (IMDb): 1
- Historische kranten: 1
- Memory of the Netherlands (Geheugen van Nederland): 1

It should be noted that one person wrote down "laptop and tv" as information source. The above list is thus only representative for seven out of the eight participants. Each of these seven participants mentioned Google as their source. When asked about how they use Google, most participants answered that they use their subject of interest as a search term (e.g. "Jan Sluijters", "Rococo", "Hermitage Amsterdam") and in general look at the top three hits in Google. These top three hits are usually hits that direct them to the Dutch or English Wikipedia. Four people also use Wikipedia directly, two also check out museum websites that are relevant to the episode they've watched and one person goes directly to the AVRO website for extra information. One participant also used the IMDb, the historical newspapers from the National Library of the Netherlands, and the Dutch image library Memory of the Netherlands. The newspapers will become available through Europeana as part of the Europeana Newspaper project and the Memory of the Netherlands is already included. Europeana, Wikipedia, the AVRO website, and the IMDb were already on the white list of LinkedTV for the TKK use case. It has been complemented with all museum websites relevant to TKK as a result from the focus group. Although LinkedTV is, cannot and should not be Google, we do need to take into account that users will be used to and expect a Google-like experience.

2.2.6 Mapping feedback to requirements

The feedback gathered during the video and additional information exercise was mapped to the requirements division used in D3.1 Specification of Functional Requirements Satisfying User Information Needs. The outcomes were as follows:

³ TV: Why?. Perspectives on TV: Dual Screen, Catch-up, Connected TV, Advertising, and Why People Watch TV. Edinburgh: MediaGuardian Edinburgh International Television Festival / Deloitte, 2012. <http://www.deloitte.com/assets/Dcom-UnitedKingdom/Local%20Assets/Documents/Industries/TMT/uk-tmt-tv-why-perspectives-on-uk-tv.pdf>

Information

Additional information

- Person: artist info/bio (8x)
- Person: expert info/bio (8x)
- Person: historical person mentioned (2x)
- Location: building/museum where episode is recorded (6x)
- Location: where the artwork on the show is from (1x)
- Object: specific artwork shown in TKK (4x)
- Topic: legend/fable incorporated in artwork (1x)

Related information

- Person: other works by artist/maker (3x)
- Person: information on artist's contemporaries (2x)
- Location: what's on in the museum / planning museum visit (1x)
- Object: more information about similar artworks (1x)

Communication, Transaction, Manipulation were not explicitly mentioned during the exercise. Four of the eight participants indicated they would look up more information afterwards and not during the show. This indicates that bookmarking segments and information sources should be a requirement. The discussion was further stimulated by showing the participants the first second screen demo from Noterik.

Based on the demo, the participants got additional ideas on how a second screen app for TKK would be useful for them. They commented that bookmarking would indeed be ideal, since in many cases they'd prefer to look up information after the show is over, and not during. They suggested to not show the timeline layer with ten-second increments as in the Noterik demo, since that would distract them too much. The participants would much prefer to see the various chapters related to the objects in TKK in a chronological order as a timeline, with a picture of the object itself as a visualisation for that chapter. Then, if you select the picture of a chapter, you can access the related information. Furthermore, the participants would like to be able to send specific fragments (not whole episodes) to friends via email to share topics of interest. Finally, they indicated they would like to browse and search through chapters from the TKK archives regarding specific types of information, such as topics, artists, experts, materials, art forms and value of objects. When they find an interesting chapter based as a result of such a browse or search activity, they would like to use the second screen to send them to the big screen. Furthermore, they would like to see the descriptions of the objects, its creators and other types of information, since that would save them the trouble of having to look this up themselves, and since sometimes it's hard to figure out how to spell names or terms.

2.2.7 Information preferences

As was described above, the focus group participants have specific information preferences. These preferences can be clustered as follows:

WHAT

- Value of an object
- Type of object (e.g. painting, clock)
- Type of material used (e.g. silver, pottery)
- Topic: art style (e.g. Jugendstil, Delftware)
- Topic: art period (e.g. Renaissance)
- Topic: legend/fable incorporated in artwork

WHO

- Person: Creator of object
- Person: Expert
- Person: Historical person
- Person: Contemporary of creator

WHERE

- Location: building/museum where episode is recorded
- Location: where the object is from
- Location: what's on in the museum / planning museum visit

Although this is a long list, not every TKK chapter will have to be enriched with all of the above types of information and related online sources. The participants also remarked that once they have seen the bio of an expert one or two times, that is enough. This means that personalisation techniques should be implemented that take these information preferences and these types of repeated enrichments should not be shown each time, but removed after an x amount of times. Participants furthermore noted that they have specific preferences: some are much more interested in the value of an object, whereas others are most of the times more keen on learning more about the objects themselves. In short, it is important for LinkedTV to personalise the types of information and related sources.

2.2.8 Conclusion

Even though the TKK focus group only consisted of eight people, it provided many insights. In general, the scenarios written in the first year were confirmed. The TKK viewers are very information-oriented, prefer to look up information later, and are interested in the information that for a very large part was already in the existing white list. It became apparent that the typical person that watches TKK (e.g. 50+, no interest in smartphones) is mostly interested in getting more information, and not so much in social features (e.g. sharing opinions via

Facebook, Twitter) and complex functionalities, such as uploading pictures of their own belongings to find similar objects from TKK. Furthermore, they do not want to be distracted during the show, but consult information about the objects and topics discussed in TKK afterwards. As a result, bookmarking chapters and information sources will be a vital feature of the second screen. The new interface and second screen application that will be developed as a result of the work done in WP3 and WP6 regarding the user studies done so far and its outcomes should incorporate the rich information users require, but at the same time be very simple and easy to use. The user trials that will be held in year three of the project will provide even more insights in what users want and expect, and will surely provide the input needed to continue to build and improve LinkedTV's end products.

2.3 User Trials at CWI⁴

Research at CWI focused on the design and evaluation of *LinkedTV News*, a second screen companion for interacting with hyperlinked television in the domain of newscasts. The primary goal was to obtain knowledge about potential users of LinkedTV's technology regarding their information needs and an indication of the reception that this technology could have among them. We performed two initial studies: a focus group and a series of interviews with 19 participants. These allowed us to identify our target group, context of use and requirements with which we created the concept of the application. The design of the application was refined through a series of design iterations and a hi-fi prototype was produced. After creating the *LinkedTV News* prototype, we evaluated it with a task-based study performed with 8 participants of the initial studies who matched the target profile closely

The main characteristics of *LinkedTV News* are:

- It runs on a tablet PC.
- It targets users between 25 and 45 years of age; highly-educated; who like to be up to date about the international news; watch news broadcasts regularly; and own a tablet computer or share it with someone in their household.
- It proposes the integration of two activities that are related by subject, but currently often take place through different devices and at different times namely, watching TV newscasts and consulting online newspapers and videos.
- It allows synchronous as well as asynchronous interaction with the television (interacting with the application while watching TV as well as bookmarking news and postponing their in-depth exploration).
- It offers two interaction modes represented by lean back and lean forward viewing.
- The lean back mode presents condensed information related to the objects, places, persons, and events in the news continuously in the form of slides (a paragraph of

⁴ A more detailed description of this focus group and its outcomes can be found in D3.5 *Requirements document for LinkedTV user interfaces (version 2)*.

text illustrated by an image). This mode is automatic and requires no user interaction, although interaction is possible if desired.

- The lean forward mode enables in-depth exploration of each news headline in the categories: different sources; opinions of different authors; in-depth articles; timeline; and from the point of view of geo-localized tweets.

We showed that *LinkedTV News* succeeds in fulfilling many of the users' needs and requirements identified in the preliminary studies. Overall, there seems to be interest from users in a hypermedia solution for the news that integrates online newspapers and video with television broadcasts. The hi-fi prototype served as a tool for illustrating and sharing a future vision of hyperlinked broadcast news.

3 Revised Scenarios

Informed by the ongoing technical implementation progress, which was helping inform what was feasible for the scenarios and what was not, and complemented by the user trials described in Section 2 which were helping give a first insight into “customer” interest and requirements for the described scenarios, both RBB and Sound & Vision analysed whether their scenarios, as presented in D6.1, needed any correction to better reflect new focus and insight in the LinkedTV project. For example, during LinkedTV's second year there was a new focus on *second screen* applications, having seen that market trends were indicating that direction for future TV-Web interaction. Meanwhile, the University of Mons scenario involving Media Artists was returned to, with a MEDIADROM competition set up and executed to find artistic ideas which could be pursued within the LinkedTV project.

With the scenarios revised and the first release of the integrated LinkedTV platform available, incorporating the functionality of analysis, annotation and enrichment of seed videos, both “Interactive News” (RBB) and “Hyperlinked Documentary” (Sound and Vision) were ready for a first realisation within the LinkedTV workflow. Chosen seed videos were uploaded for ingestion into the platform and first runs of analysis, annotation and enrichment performed.

To evaluate and enable the realisation of scenario demonstrators on the current LinkedTV workflow – as implemented in the LinkedTV platform – the scenario partners were asked to prepare for selected seed videos a curated list of video annotations and enrichments, i.e. based on their own domain knowledge they identify the concepts which appear in the video which they consider to be of potential importance to their viewers, and for those concepts identify typical online media assets which are on their whitelists and would represent well the concept to the viewer in terms of the goal of “satisfying the user information need”⁵. Using the LinkedTV Editor Tool, the scenario partners can then prepare the data on the LinkedTV Platform, which initially contains annotations and enrichments generated fully automatically from LinkedTV analysis and annotation services, to reflect closely the curated (“expected”) data foreseen in their list. A part of the technology evaluation, we are able to also compare the content of the curated lists with the contents of the LinkedTV Platform following the automated analysis and annotation processes. While a direct correlation cannot be expected, we can look at two metrics for determining the effectiveness of the current, automatic approaches:

- Coverage. The extent to which the annotations and enrichments in the curated lists are included within the automated results.
- Relevance. Some of the automated results may not be in the curated lists but determined as relevant by the scenario partner. Here we look at the ratio of relevant to irrelevant results, as a measure of manual effort for scenario preparation (since a

⁵ Seen as the main purpose of LinkedTV, recall D3.1 “Specification of functionality requirements satisfying user information needs”.
<http://www.slideshare.net/linkedtv/linked-tv-d31specificationoffunctionalrequirementssatisfyinguserinformationneeds>

scenario stakeholder would use the Editor Tool to remove the irrelevant annotations and enrichments).

Thus these evaluations can give valuable feedback to the technical work packages to enable them to refine their technologies and more closely generate data usable in “real world” scenario contexts. A full evaluation along the above lines will be conducted in the next part of the project alongside the user trials which inform the scenario partners on user interest and uptake for their demonstrators. In the meantime, to ensure that the future value of LinkedTV can be demonstrated publicly now, the “curated” scenario data is used in the LinkedTV Platform to drive 'scenario demonstrators' which show idealised video annotations and enrichments.

In the third year of LinkedTV, a major goal of the technical work will be to refine the current workflow to more closely meet the expectations of the scenario partners, iteratively reducing the expected effort for a scenario partner to curate the results in the LinkedTV Platform in order to enable a working, distributable scenario.

3.1 RBB Scenario: Interactive News

RBB revised the first year's scenario with respect to two aspects. First, from a technical perspective and secondly by integrating suggestions answering the user needs arising from the user trials. The following two paragraphs will elaborate on these two aspects while the following sub-chapters will focus on the second year-demo scenario.

Technically, the second year scenario focuses on the Second Screen-/Multiscreen-use case. While in the first year, the demo scenario described 65 year-old retiree Peter using an interactive TV service with a Remote Control, this year's demonstration focuses on a service which combines the TV set with a second device, in this case a tablet, for consuming the related information. Basically, the first or main screen, i.e. the TV, is used for displaying the actual TV programme. Whenever the content has been enriched, a notifier on the TV screen signals that the user may find additional information on the second device. All enrichments are then structured, ordered, and presented on the tablet, with the exception that especially videos and images can be swapped to the main screen. The navigation through the enrichments, however, will solely happen on the multitouch device.

With respect to the user scenario no fundamentally new storyboard was created, but the technical focus and the feedback from the test users required some optimisations. RBB's original Linked News Service concept was confirmed largely by the end users participating in the above mentioned evaluation sessions. Only very few aspects were stressed more than originally foreseen. Although these had already been envisaged they naturally gained more focus and were integrated into the below scenario.

The following scenario is based on the current demo content, a recent news show of 19 June 2013. This show was chosen mainly because it clarifies some user information needs ideally (hopefully these get clear in the scenario) and because there were some people and places in it that everyone knows.

3.1.1 Updated Nina scenario

Nina, aged 33, is a young, urban mom. Her baby is growing and getting more active so Nina has to be even more flexible, also with respect to where she is watching the news and when she is consuming additional information; e.g. the baby is sleeping or playing in her room, but Nina has to keep an eye on her and be able to pause the interactive *LinkedNews* at any time.

The tablet is her main screen, 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, more flexible.

Looking for RBB's *LinkedNews* Nina starts her TV set and, tuning to RBB directly, RBB's HbbTV start panel is launching automatically.



Figure 1: RBB's HbbTV start panel, easily launched by pressing the red button

3.1.1.1 Selecting the show

After sliding through the list of available *LinkedNews* programmes she chooses yesterday's show by tapping on the play button of the preview picture

- The main video automatically appears on the big screen while
- The additional information grid appears on the tablet, slowly filling up with every new piece of additional information the editors prepared for this show

3.1.1.2 Selecting Chapters

According to Nina's preferences the editor's playlist order is the default one. In other words, when she starts a show the news items are always ordered like in the linear TV programme. However, she can always change to a different playlist order on the left-hand side of the tablet screen or in the LinkedTV service settings (see the paper prototype for personalisation settings on YouTube⁶ or in Figure 2). Nina can also drag "later" chapters to the front/left if she wants to watch something a bit sooner. In other words she can change the order of the news items dynamically by moving the title.

⁶ <http://www.youtube.com/watch?v=2JzCEHm5isU&hd=1>



Figure 2: Adapting the preferences with a sliding menu (Screenshot from paper prototype workshop between RBB and Noterik)

3.1.1.3 Watching the LinkedNews programme

Air Force One

At the beginning of the show, Nina is still paying attention, knowing that the first chapter is usually one of great importance. Of course, she knows what will be the topic of the day: US president Obama visited Berlin yesterday. The news show starts with a short switch to Tegel Airport where the Air Force One is preparing for take-off. Nina skips this immediately as she is neither interested in airplanes nor in watching the president's departure. This is of no added value to her at all.

Speech at Brandenburg Gate

This next segment looks much more interesting to her as she wants to hear what Obama said and especially expects to hear some reactions, too. The service links to some interesting things, but as she doesn't have the time to look into them right now - - she decides to bookmark them quickly:

- The text of the president's full speech
- The text of the Governing Mayor's speech (Klaus Wowereit)
- The text of the Chancellor's speech (Angela Merkel)
- The security dossier
- and, last but not least, the image gallery of the big event at Brandenburg Gate

The Family Obama in Berlin

When the next segment starts, Nina grabs her iPad and leaves the sofa. She is still listening while she is folding the laundry from the dryer, but she is not following too closely. The off voice mentions that Michelle Obama has her daughters with her but also Barack's half-sister Auma. Auma? Nina never heard that name and didn't know that Barack Obama has a half-sister. So she picks up the tablet to see if there is any additional information about Auma Obama, and there is! She is curious to learn more about her right away so she clicks on the thumbnail to see who she is. The rest of the news spot is mainly about the places where they went and a little about Michelle Obama's warm and intelligent attitude. Nice to hear, but no motivation to look any closer as Nina knows all these places already.

AIR FORCE ONE, pt 2

The anchorwoman speaks about what's going on at the airport again. Nina first tries to ignore this and let her talk, but when she realises this is going to take a little longer, she skips again.

Dinner at Schloss Charlottenburg

This next chapter is about the official dinner at Schloss Charlottenburg, who was there, what was served, etc. This is something that catches Nina's attention

Nina is watching again for a few minutes and tries to find out about the responsible chef, Tim Raue. Does he have a restaurant somewhere nearby? (Where) Can she try his two star cuisine? The reporter mentions the menu highlights and the tablet view has a link to the complete menu and recipes for sharing this presidential experience

Intrigued by this, she watches the news spot and wonders who might be this guy who is sitting directly next to the president? Must be a very very V.I.P. - can you think of a more prominent position than this? - but Nina never saw this guy before!!! So Nina checks the **WHO** bar⁷ on the tablet screen to check if there is someone whom she didn't know yet (see Figure 3 below).

⁷

In the German screenshot the bars are named differently: Where = Wo, Who = Wer, What = Was

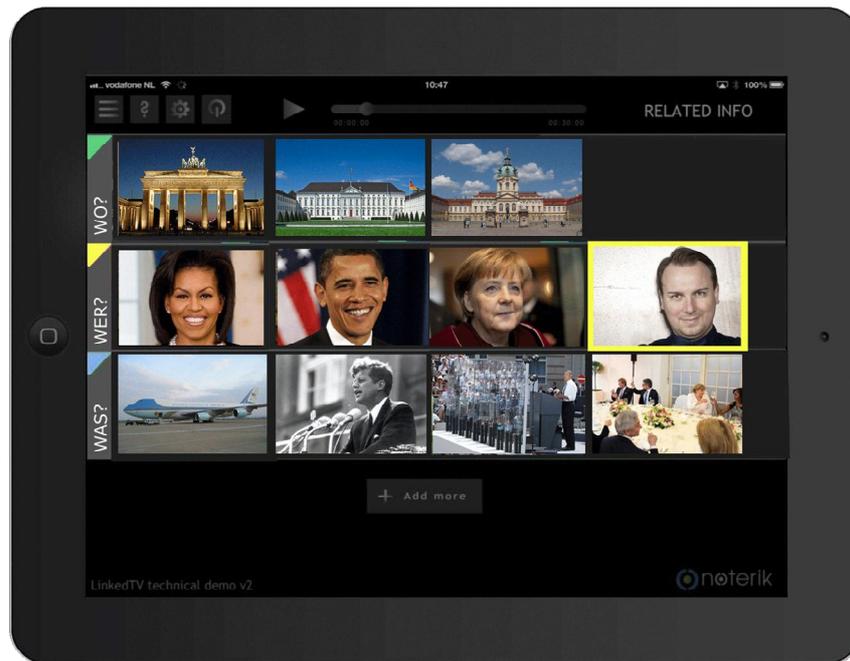


Figure 3: Structured view on enrichments on tablet

Expert Interview

Following is an interview with an expert from the John F Kennedy Institute for North American Studies at Free University Berlin.

Wow, she knows that guy! Nina is getting excited, because this Professor, the expert who speaks about the presidents Obama and Kennedy, was one of her teachers at University 2-3 years ago, so she checks whether there is some information about him; what is he doing now, etc.

The professor mentions that US president Obama had given a considerably different speech when he visited Berlin in 2008, then only as a candidate. She also bookmarks this 2008 speech for a comparison when she watches yesterday's speech.

Traffic Restrictions due to Security issues

Nina picks up her housework again and only looks up briefly to see the hotel where the family Obama is staying for their visit. She is not particularly interested but **skipping might be risky**; if the next chapter is much more interesting she might want to listen more intently again and this would slow down her housework, so she just listens "with one ear" and only starts paying attention again as soon as something catches her ear.

Short News

The short news block is very good for keeping busy with the laundry; interesting to listen to, but not interesting enough to look up.

Summer Event in Brandenburg

This next spot is about the annual party, a party where politicians and entrepreneurs, as well as artists, actors, musicians, etc. celebrate the year's achievements with the people in Brandenburg. This year it takes place at the wonderful Krongut Bornstedt, but everyone is

worried about Matthias Platzeck: the "Prime Minister" of Brandenburg has been ill for some time and there are rumours that he might withdraw. So, today everyone is interested to see if he will be there or, if not, who will represent Brandenburg's government and the Social Democrat Party.

Krongut Bornstedt is very nice, but Nina doesn't have the time now to browse through the beautiful images in the LinkedTV app, so she bookmarks the location with a click on the "where" bar for a look at the images when the baby is asleep.

Nina is even more interested in any news about 'Governor' Platzeck - His stroke - at this young age! - was quite a shock for her! Will he come back? Of course, this is a major topic in this relatively long news item and Nina is listening more closely. She is very interested in the portrait of Platzeck; how he started into politics, his major achievements and the long time as "pater patriae". Nina is especially grateful for the option to keep an eye on this topic and be notified about any news, changes, etc. through the app

Nina also wants to know who Dietmar Woidke who acted as his substitute is. Could that be the new 'Governor'? Again she is quite happy to bookmark his portrait and see how he got into his current position as Platzeck's side-kick.

When the reporter speaks about the recent flood in Brandenburg, Nina checks whether there is some background information about the current status, too. The interview with some of the people who became "heroes overnight" in the hard days and nights of the flood give the impression that everything is over now and all is well, but only a few days ago she heard that there are still people suffering a lot from the consequences, so Nina would like to know more about the backgrounds like: the current state of the catastrophe, the planned reactions and political steps (and here again she would love to be notified/updated to see whether these things really happen!)

Mosquito Plague in the Flood Areas

Interestingly enough, the next news item also features the recent flood. This time focusing on the huge number of midges that now afflict the area, because the flood created the optimal breeding situation for these insects. Nina is very interested in related information on these nasty little creatures, especially how to avoid being stung or what to do if the inevitable eventually did happen.

Unfortunately, her daughter Lisa seems to have awakened, so Nina quickly bookmarks the whole chapter to check it later.

Weather Forecast

The news programme concludes with a weather forecast. Nina didn't care to turn off the TV yet, but clearly she is not following this closely anymore.

As soon as Lisa will be asleep again, Nina will take the time to check her bookmarks.

3.1.1.4 Scenario summary

- Nina uses her tablet as the main screen as she has to remain mobile and flexible, both in- and outside her home.
- The TV screen is the main source of information in the first place, because she can see it basically from most angles and because she can hear it well. Although the tablet is the main source for additional information, Nina also uses the TV screen for viewing linked videos.
- Nina sometimes skips when she gets impatient, but often keeps the programme running because she is doing other things meanwhile.
- Nina bookmarks all the interesting new information that she wants to consume later.

3.1.2 Scenario realisation

For the scenario realisation, we have decided to concentrate on the Nina persona and the revised scenario described here, particularly focusing on the 'Dinner at Schloss Charlottenburg' chapter of this news programme. Here we have very illustrative content for a person like Nina who is not only interested in the main news item but on associated happenings on screen – who cooked the meal for the VIPs? Speaking of VIPs, who's the guy seated next to Barack Obama? In the 2 minute 30 seconds long news segment 14 concepts of interest can be (manually) perceived to exist, whereas for Nina there are 2 specific concepts she wants to find out more about: firstly, Tim Raue who is the cook of the exclusive meal, and secondly, Ulrich Grillo, the lucky person to sit next to Barack Obama. It's fascinating for Nina to discover that Tim Raue has a restaurant in Berlin, although she's less excited when she sees the prices in the menu! Still, she bookmarks a DeutscheWelle video showing the Michelin-starred chef in action⁸ for later viewing. The other VIP turns out to be the head of the German Industry Association, which Nina finds interesting... how closely business and politics are mixed! However looking at the "Who's" in her LinkedTV application, she is more intrigued to see the basketball star Dirk Nowitzki shown – was he also at this special meal? Yes, she's able to see again the fragment of the news report where Dirk can be just made out in the background... Nina has a certain feeling of satisfaction to know something she knows all of her friends will have missed while watching, since they don't have the LinkedTV app! Well, something to tell on the phone later this evening...

3.1.3 Scenario evaluation

A RBB curated list was prepared for the news programme of the 19th June 2013, and in particular for the 7 video chapters (news segments) that occur within the first 20 minutes duration for which more than one concept could be annotated.

⁸ <https://www.youtube.com/watch?v=LbBNbL0LsbY>

- Speech at the Brandenburg Gate (3:12-5:00)
- A tough program (5:01-5:50)
- Dinner in Charlottenburg Castle (7:07-9:29)
- Expert Interview (9:30-13:19)
- Transportation Diversions (13:20-15:44)
- Local News Summary (16:20-17:26)
- Regional Festival at Bornstedt (17:27-20:39)

An evaluation of the automated annotation and enrichment results was also made compared to this curated list for the chapter considered in the scenario demonstrator. The concept detection from speech and subtitles worked largely very well, with 'errors' largely coming either from concepts which could be manually added by the editor but were not explicitly being mentioned or referred to in the video (e.g. Ulrich Grillo) or concepts being automatically generated from the subtitles which were referring to concepts too general for being useful in LinkedTV enrichment (e.g. Berliner). For the latter, we plan to filter automated annotation in the next year along specific types in order to reduce the number of “too general” concepts being automatically added. This can be seen in the enrichments evaluation which show all concepts annotated to the chapter on the Dinner in Charlottenburg Castle. Enrichments were found for a smaller subset of annotations but when found, they were often 50%+ useful for the concept – more general concepts, as expected, produced less useful enrichments (e.g. Maschine) but specific concepts relevant to RBB and other German broadcasters' public content (the scenario white list sources) were also usefully enriched (e.g. Krongut). A more comprehensive evaluation will be conducted in the next project phase.

3.1.4 Scenario demonstrator

A video has been prepared showing Nina's interaction with the LinkedTV system while watching the Dinner at Schloss Charlottenburg chapter, which has been placed online together with a description at <http://linkedtv.eu/demos/linkednews>.

The same scenario can be demonstrated live at events in the coming year using the LinkedTV Player.

3.2 Sound and Vision Scenario: Hyperlinked Documentary

Based on the technical outcomes of the project and insights from the focus group outcomes (refer to Section 2.2), project meetings in Berlin and Prague, and the outcomes of the internal trials held by the University of St Gallen (refer to Section 2.1) and desk research, the scenarios hyperlinked documentary were revised as summarised in the following:

- Rita's scenario has been left unchanged. The scenario already ticked many boxes, such as the interest in the value of objects, the experts on TKK and planning a museum visit. The only element of this scenario that did not quite match the

outcomes of the focus group is that Rita is a relatively young TKK viewer; all eight focus group participants were over 50. However, the other two personas are in that age group, and since there are also younger TKK viewers, Rita's age was not changed.

- Bert: since the experts interviewed for the internal trials, desk research and focus group outcomes showed that LinkedTV should focus more on people watching television together, and the dynamics that form as a result of this, we added Bert's wife Anne to the scenario. Also, for TKK especially, the scenario was too technology-driven and not realistic for the average TKK viewer. Therefore, Bert no longer uses the LinkedTV TKK application to find more information about objects he's thinking about buying or selling for his antiques shop, but watches the show because it relates to his interests in general. Of course, he's still interested in more information about objects that he'd like to buy or sell, but no longer expects to find information about auctions from similar objects. Instead he now likes to get more information about the specific types of objects on the show. Anne is a more casual viewer and isn't too interested to fiddle with second screen applications like Bert. She does ask him to send her an overview of the information sources related to objects that she really likes or learn more about.
- Daniel: has always been the most far-fetched persona - a young man who uploads pictures of objects he sees in flea markets to see if similar items ever appeared in *Tussen Kunst & Kitsch*. Michael, a 55-year old library manager from Laren, has replaced him. Although he's a more 'stereotypical' *Tussen Kunst & Kitsch* viewer, he is a bit of a techie and is an information junkie. Michael likes to organise, and uses the playlist option to sort his TKK interests. He likes to get content recommendations from the *Tussen Kunst & Kitsch* archives, and he suggests links for the TTK editors to use.

3.2.1 Updated Bert scenario: Bert and Anne: Antiques Dealer, volunteer (older, high + low media literacy)

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 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.

3.2.1.1 Revised scenario

1. 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.
2. Bert bookmarks this chapter, so he can view it and the information sources related to it later on.
3. Bert immediately gets the chance to do so, because a chapter about a watch is next, something he doesn't really care for.
4. Anne is however very interested in the watch chapter: it depicts gods from Greek mythology and she want to brush up on her knowledge. She asks Bert to bookmark the information to the Greek gods to read later.
5. Bert and Anne read and watch the additional information related to the wooden statue chapter and the Greek mythology after the show. Bert has sent the latter to Anne through email, so she can read it on her own device.

3.2.2 Updated Daniel scenario: Michael: library manager (more Y3 focussed scenario)

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, he adds these links to the information sources of the chapters he finds the most interesting.

3.2.2.1 Scenario summary

1. Michael comes home late and has thus missed parts of a chapter of *Tussen Kunst & Kitsch* on a Delftware plate. He decides to watch it later.
2. Michael sees a chapter on a silver box, which reminds him of a silver box he inherited from his grandparents.
3. 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.
4. A day later, Michael goes back to the Delftware plate chapter he saw partly the day before.
5. Michael looks for related TKK chapters.
6. He finds an episode filmed at De Porceleyne Fles, a renowned Delftware factory in Delft.
7. Michael sees one important link is missing in the related content, and adds it to the opening chapter from the episode as a suggestion for the TKK editors.
8. He adds the relevant Delftware chapter to his “Delftware” playlist.

3.2.3 Scenario realisation

For the scenario realisation, we have decided to concentrate on the 'gold watch' chapter watched by Anne, who is interested in the Greek mythological aspects (refer to 3.2.1.1. point 4). This is a five minute TV programme fragment where the antique item (a golden Brequet watch) is clearly shown and elaborated, with references to both Hebe (a Greek Goddess) and Caritas (the Christian virtue of Charity). Anne first explores the concept of Caritas, mistakenly thinking it to be one of the Greek philosophical virtues and is at least interested to discover it actually belongs to a later set of “theological” virtues introduced after the New Testament. She then delves more into the concept of Hebe, where she is fascinated by the stone statues of the goddess that can be found in different places in the world, finally reading about the sculptor Antonio Canova and making a note about a particularly pretty Hebe statuette which can be seen in Forli, Italy.

3.2.4 Scenario evaluation

A Sound and Vision curated list was prepared for the 6 seed video chapters chosen for this year's scenario realisation:

- Mu.ZEE (Oostende) – 28-12-2011 - Chapter: Delftware plate
- Graphic Design Museum (Breda) – 31-3-2010 - Chapter: Gold watch
- Museum Twentse Welle (Enschede) - 21-12-2011 - Chapter: Wooden Maria statue
- Museum Martena Franeker (Franeker) – 14-11-2007 - Chapter: Silver box
- Hermitage (Amsterdam) – 8-12-2010 - Chapter: Introduction – Hermitage

- Hermitage (Amsterdam) – 8-12-2010 - Chapter: Jan Sluijters painting

An evaluation of the automated annotation and enrichment results was also made compared to this curated list for the chapter chosen in the scenario demonstrator.

It seems concept detection produces mixed results, with textual extraction techniques generally being effective to identify what are the relevant named entities, but the determination of which (semantic) concept that named entity refers to sometimes failing to correctly disambiguate terms. As Dutch text extractors are improved we should be able to expect further improving results here. Other analysis techniques may not yet be fully effective, e.g. OCR on text overlays in the video frame would, if functional, pick up on the names being shown on screen.

The automated annotation pulls out a lot more entities than needed for a good video enrichment. There are though entities additional to the “curated” concepts in those results which could be used, e.g. Chapter 6 of the Graphic Design Museum (Breda) video has annotations such as 'Arthur Rubenstein' or 'Vroom & Dreesmann' which seem to be very specific references where the viewer would like to know who/what is being referred to. A first refinement step would be to restrict extracted entities to ones of a certain "white list" of entity types (e.g. not just any people but those who are artists, craftsmen, sculptors...).

The enrichment results are very encouraging, since the majority of links are marked as related to the annotation even if much less are deemed truly "useful". Again here for a deeper analysis we need to look at which enrichment services return which enrichments, especially those who are "useful", to try to better judge automatically which enrichments are the ones to highlight in the player (e.g. do "useful" enrichments have some shared characteristic that makes them so, so that we can design appropriate filters on the Platform side?). A more comprehensive evaluation will be conducted in the next project phase.

3.2.5 Scenario demonstrator

A video has been prepared showing Anne's interaction with the LinkedTV system while watching the Gold Watch chapter, which has been placed online together with a description at <http://linkedtv.eu/demos/hyperlinkeddocu>.

The same scenario can be demonstrated live at events in the coming year using the LinkedTV Player.

3.3 University of Mons Scenario: Media Arts

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 a special session dedicated to artists at the multidisciplinary conference INTETAIN, and then through the launch of a public call for proposals for scenarios involving the project technologies used in a “post-TV” context.

UMONS organized the 5th International Conference on Intelligent Technologies for Interactive Entertainment (Intetain 2013, 3-5 July 2013, Mons, Belgium⁹). Three LinkedTV special sessions have been organized at the conference:

- One scientific oral session where several achievements of the project have been presented. Five papers have been presented at the session. These will be available in the Intetain conference proceedings that will be published shortly through the Springer LNCS series,
- One industry-academia panel on the future of television, co-organized with the Walloon industry cluster for image, sound and text (<http://www.twist-cluster.com/>), with the participation of two representatives of the Belgian broadcast television industry, and moderated by a professional from the sector.
- One demonstration poster session where several interactive setups achieved in the project have been demonstrated.

The demonstration session has also been made open to external artistic contributions. Active curation has been necessary to attract participation of media artists whose concepts are in relation with one or the others of the LinkedTV themes and research activities. Four artists finally presented their concepts.

In a second step, a special session of the Multimedia Modeling Conference (MMM 2014, 6-10 January 2014, Dublin) coupled with a competition for artful "post-TV"¹⁰ scenarios has been organized (<http://www.mediadrom.tv>, <http://mmm2014.org/>). The call has been advertised to several thematic lists:

- artsciedu <http://sympa.limsi.fr/wws/info/artsciedu>, a French list about calls and events related to transversal relations between art, science, education and industry
- Digital MediaArts Numériques <http://www.scoop.it/t/arts-numeriques>, an English/French curated list on digital media, through scoop.it and Facebook
- mondaynews, a Collection of (media-)art related calls and deadlines
- netex(at)nmartproject.net for publishing in <http://www.nmartproject.net>, a website that also advertises media art-related calls
- <http://www.ecrea.eu>, a general international forums/ mailing lists for art and media students
- the UMONS numediart Institute for New Media Art Technology
- the LinkedTV web site

⁹ <http://www.intetain.org/2013/show/home>

¹⁰ Post-TV being used here to encourage thought about how media art can help conceptualise new forms of exploring audiovisual content using LinkedTV technology which could 'replace' today's understanding of television

- several artists with whom UMONS has already been collaborating, as well as others identified as potentially relevant to the post-TV concept have also been contacted directly.

The objective of the call and special session was to attract original contributions by artists with whom we will then be able to experiment and prototype using some of the LinkedTV technologies. Six contributions have been received, two of which were by artists already presenting at the Intetain 2013 conference. During the submission process, active support has been provided by UMONS into helping the artists to get a better understanding of the LinkedTV research areas and final goals, and into brainstorming and reflecting on how the relevant LinkedTV technologies could be leveraged to the benefit of the concepts the artists proposed to push forward. The review process involved independent reviewers appointed by the special session official organizers (Prof. Thierry Dutoit from LinkedTV participant UMONS, and external expert Prof. Insook Choi, Associate Provost for Creative Technology at Columbia College Chicago).

3.3.1 Descriptions of Proposed Concepts

- Submission 1 proposes work on multimodal and tangible interfaces for manipulating multimedia content with ***a use case centered on the recent protest in the Gezi Park in Istanbul, relying on large amounts of user generated content such as photographs, videos and tweets.*** The concept may be relevant to other event related user-generated and crowdsourced content though. The proposal presents some originality. The kind of content considered make the proposal appealing too with respect to the realm of post-TV and the linked media and in particular the multimedia information retrieval and semantics for facilitating the interlinking. The short-term flow nature of the content and its immediate relevance would make such emerging technologies very relevant. Some challenges it creates regarding the technology are outlined but still need more developments and clarifications. On the user interface and presentation engine side, the proposers go ***beyond remote control and interactive screens in particular through the use of tangible interfaces and 3D maps of places.*** The proposal has been retained for presentation at the conference, and further discussion with LinkedTV. Its key selling point lies in the original kind of content is proposes related to crowd sourced content about a social movement, and in the usage of innovative interface modalities.
- Submission 2 presents a concept for an application enabling to search and explore artist works sorted according to themes (and under the lines according to disciplines and genres) as well as their inter-relationship and their connectedness with other works. The art form proposed here as a use case is ***plastic theater***, and different ways for exploring the works are proposed, including according to thematic timelines. The application would be developed as an interactive setup to be ***installed in media libraries, museums or exhibitions, or special events such as performances***

related to the art form covered. Despite no second screen settings are proposed, the proposal presents mock-ups of interfaces. The contribution presents some originality. Its significance with respect to the realm of post-TV and the linked media and in particular the relevance of multimedia information retrieval and semantics for facilitating authoring, and the research in advanced presentation and interactions capabilities are briefly outlined. At the moment, the proposal heavily relies on careful editorial input. The challenges it creates regarding the technology are not clearly or explicitly stated, but some of them are likely within reach of current technology. However, it is not clear whether the content proposed is variable enough so as to make such emerging technologies relevant (f.i. enabling the creation of hyperlinked content almost on the fly), and if one could learn from this category of content in designing a technology that could apply also to other art forms. **The relevance of enriching information with web content is briefly presented** though, and some initial links towards **ontologies** are proposed. The proposal has been retained for presentation at the conference, and further discussion with LinkedTV. Its key selling point lies in the original kind of content related to an art form it proposes and in the usage scenario outside of the living room (such as in museum and exhibitions).

- Submission 3 proposes an application and research issues in **life-logging including video and multiple sensory signals of a day while wandering in a city**. It is described as a **mobile application** enabling to generate a report of one's experience in a city. As such this could be attractive to the general public, e.g. tourists. The proposal covers both practical aspects as well as theoretical considerations regarding the perception of an environment, supported by a few references. The kind of content considered make the proposal appealing too with respect to the realm of post-TV and the linked media and in particular the multimedia information retrieval and semantics for facilitating authoring/summarization, and the research in advanced presentation and interactions capabilities. Mock-up of interfaces and how these are created from the content are already proposed. The short-term flow nature of the content would make such emerging technologies very relevant. Also, the **inclusion of other sensory signals (beyond sound and video), and the possibility to augment the content with information from the user itself (activity recognition)** present some interesting originality. However, the challenges it creates regarding the technology are not explicitly stated, and proposals for the enrichment with content from the web and the value this could bring are still missing (e.g. generating enriched summaries of the life-logging data). One could think about creating enriched documentaries of a city tour f.i., augmenting the summaries with information from relevant personalities, recognized places, events (geolocalized and/or timestamped), requiring more developments of the concept, and clarifications to be discussed with the proposers. The proposal has been retained for presentation at the conference, and further discussion with LinkedTV. Its key selling point lies in the very original kind of content it proposes (user-generated data from smartphones) and in the mobile usage scenario

outside of the living room and on the inclusion of other modalities beyond video, the smartphone becoming the authoring tool for generating enriched reports of personal experiences. The semantic and hyperlinking facet needs more development however.

- Submission 4 proposes to research on the authoring of multisensory experiences (and on the experiencing environment themselves) that merge different art forms, in particular comic strips, video art and soundscapes, with the potential for enriching the experience with other sensory modalities created by vibrating mattresses and water displays. The initial theme is related to **monsters**. The proposed use-case relates to a **living lab on controlled multisensory environments (MSE) in hospitals**, a therapy for people with autism or developmental disabilities, and may include e-learning facets. Foreseen users are hence patients invited to participate to such experience in order to contort them to accept their situation and care programme. The proposal is related to a project that will be featured at the Mons 2015 EU Capital of Culture Event. Some elements do not present obvious relevance to the post-TV technologies queried by the special session theme. The contribution is original though and covers very innovative aspect both on the authoring side, f.i. the use of a software library enabling the **authoring of non-linear interactive stories** (beyond concepts for enriching linear television content f.i.), and on the presentation/interaction side, f.i. through the use of **different forms of displays, beyond the current second screen** paradigm. Its significance with respect to the realm of post-TV and the linked media and in particular the relevance of multimedia information retrieval and semantics for facilitating authoring are briefly outlined, but needs more developments. In particular, it is not clear whether the content proposed has this short-term flow nature which would make such emerging technologies relevant. Besides, a **concept for the enrichment with content from the web is still missing**. The proposal has been nevertheless retained for presentation at the conference, and further discussion with LinkedTV. Its key selling point lies in its usage scenario outside of the living room (in particular in the medical field), and the wealth of display interfaces that seem relevant to the concept of multisensory stimulation, as well as in the exploration of non-linear storytelling components. The semantic and hyperlinking facet needs more development however.
- Submission 5 proposes research and development around interactive content enabling to **search and explore movies information**, with a **use-case dedicated to the genre of fantastic movies**. The proposal has two facets. On the one side, an application for presenting background and enriched information about the content, and on the other side, on enabling to remix within this selected specific cinematographical genre. The targeted audience consists in **movies and art festivals and their fans**, and contacts have already been taken with the organizers of the annual Brussels International Fantastic Film Festival. The dynamic nature of

movie extracts, actors and directors interviews as well as public interviews make the automation process proposed by LinkedTV very relevant. The enrichment part related to movies information as well as political themes addressed in movies would need more development though. Despite its relevance, the proposal has been discarded for presentation at the conference by the external reviewers, based on scientific considerations, and is hence discarded from the LinkedTV programme at this stage.

- Submission 6 proposes a significant contribution to research and art related to soundscapes. However, besides the proposal for experiencing such real-world audio installations from the comfort of a living room, its relevance to post-TV and the linked media (especially video) are not developed. Areas such as multimedia information retrieval, semantics or the research in advanced interactions capabilities are not covered. This proposal has been considered out-of-scope by both the scientific review of the conference and has hence been rejected. It is also considered as out-of-scope by LinkedTV, and is hence discarded.

3.3.2 Summary and Next Steps

As an outcome, this process generated several ideas for experimenting with LinkedTV technologies:

- With applications *that go beyond existing television genres*,
- With *other forms of content*, such as user-generated and crowdsourced content,
- With the production of content dedicated to *more personal circles* rather than mass consumption,
- With other forms of *interaction capabilities* beyond the television set, remote control and second screen,
- With interactive screens dedicated to places outside the living room, and in particular “*social*” places such as in festivals, museums, exhibitions, and hospitals.

Several artists who were highly interested did eventually not work towards submitting a proposal. The main difficulty for most was to come up with a clear perspective on the value of all LinkedTV related components, and in particular the one related to web enrichments, which is not always easy to grasp for people outside of the semantic web realm. This also appears to be the case in some of the proposals that have been retained above.

LinkedTV will now clarify the missing details and provide the service and expertise for experimenting with the LinkedTV functionalities and how these can be of help to designing a prototype of the proposed concepts. This will take place over the next six months (October 2013 – March 2014), and (besides the MMM conference) the selected contributors will also

be invited to participate to a residence during the second quarter of 2014 (one week, at UMONS, Belgium) in order to develop advanced prototypes using actual technology building blocks with the help of software developers from the LinkedTV project.

4 Conclusions: status of the scenario realisation

This deliverable reported on the user trials performed to make a first assessment of the scenario interest & acceptance among typical end users, and the trial results helped our scenario partners to conduct a first revision of their foreseen scenarios, alongside increased clarity about technology trends and implementation feasibility within the project.

Those revised scenarios, based around a number of 'typical' personas, accessing a sample video program ("seed content") and interacting with its annotations and enrichments (from the LinkedTV technology) in a typically expected manner, were transferred to the working LinkedTV system, thanks to the release of first versions of all LinkedTV components and their integration into a solid workflow within the LinkedTV Platform.

This scenario realisation is the principle outcome of the second year of the project for the scenarios themselves, giving us a first experience of the feasibility of providing Interactive News and Hyperlinked Documentaries, as per the scenario partners' own visions for their content. As was expected, there is still a disjunction between the results of *automated* media annotation and enrichment and the scenario partners' own expected annotations and enrichments (based on manual *curation* of the seed content) – one goal for the next year of LinkedTV is to find means to bring automated results and curated results closer together, and lower content owners additional effort to check and correct these in the LinkedTV editor tool. Also, the evaluation of the personalisation components of LinkedTV will be able to make use of the difference between automated and curated suggestions of concepts and enrichments as a baseline for measuring the effectiveness of personalisation for the end user (are concepts / enrichments from the curated lists picked out as more relevant to the user out of the automated results?).

The scenario demonstrators will be available for LinkedTV to show its technology online and at events such as ICT 2013 and (expected) IBC 2014. Especially by being able to provide participants the opportunity to concretely interact with LinkedTV technology via real content, annotation and enrichments from the scenarios will help us continue to gather more feedback and insight from "typical" end users and potential industry "customers". A new cycle of user trials using the scenario demonstrators will help us validate further the usefulness of the selected annotations and enrichments for viewers, acceptance of personalisation functionality when it requires modelling of user preferences or tracking of viewer behaviour, as well as the intuitiveness of the Player user interface. More mature demonstrators are also more effective in engaging with external industry representatives as part of the ongoing exploitation efforts, assessing industry interest in the various technology offers. As a result, we will be enabled to further refine our scenarios and the technology provided for them in the third year of LinkedTV.

Appendix A: questionnaire for the University of St Gallen user trial

Questionnaire - Part 1 INTRODUCTION

Interviewer instruction: note name of the interviewee, name of the company, ask if not clear!

Introduction text:

First of all thank you for taking your time for us and giving us the opportunity to talk to you.

Within the next hour we will talk about linked television. The central element of this term is to link television to external sources such as Wikipedia, etc. This means while a user watches TV he/ she will be provided with additional content related information from the Internet.

Therefore our project called LinkedTV aims at developing a comprehensive methodology for information management to be used in the course of fine grained video annotation. This provides the basis for interlinking, search, personalization, and contextualization.

We are about to create the LinkedTV platform in order to demonstrate the feasibility of our approach including all necessary components from annotation, interlinking, and search to personalization and intuitive usage.

With the technical challenges being addressed, we are now interested in determining consumer interest in LinkedTV and how linked television fits into the overall evolution of television as a medium. Your expertise in related technology and the media market will be really helpful to us in establishing answers to those questions.

During the interview we will first of all ask you some general questions about your background. Secondly we will present you some demos of LinkedTV and finally we will ask you more LinkedTV related questions.

Any questions so far?

Let's begin with your background:

Questions	Interviewer instructions
1. You are working for What is your role in your company / ... -> insert company name organization?	
2. Could you please evaluate your main area of your work? Are you more technically oriented or more content or user interface related?	<i>Additional questions to improve comprehension, or to go more into detail: Are you mostly involved in technical development and system architecture or administration? Or are you mostly working as an editor or content manager? Do you have program responsibility? Or do you design user interfaces?</i>
3. How closely is the umbrella term interactive TV related to your work? Are you often engaged in interactive or linked television related issues professionally?	<i>Additional questions to go more into detail: Is interactive or linked television a main focus of your work or is it one issue of many others? What is your main task related to interactive or linked television?</i>
4. Do you sometimes consume Web based content on your TV or	<i>If so: What devices and applications do you use for that?</i>

parallel to watching TV?

General interviewer instruction:

If the interviewee answered question 2 with “technically oriented” follow the questions marked with T.

If the interviewee answered question 2 with “content or user interface related” follow the questions marked with B.

If the interviewee answered question 4 with yes follow the questions marked with F afterwards.

5. From your professional perspective as well as from your personal perspective: Did you lately notice any current trends related to interactive or linked television market in general? *If so: Could you describe those current trends or name upcoming innovative technological applications, content or platforms within the next 1-2 years? Could you name the players in the market related to those trends?*
If not: Did you notice any trends related to the TV market in general? If so: Please describe current trends...

5.T1. Do you have any experiences with implementing ...?

5.T2. If so: Did you have any problems? What kind of problems did you have? *These are follow-up-questions only for technically oriented interviewees,*
... -> fill in the trends interviewee mentioned

If not: Could you imagine any problems? What kind of problems?

5.B1. Which of the mentioned functionalities/trends are a must-have for Smart/Connected TV applications?

5.B2. What are your experiences with these? What do users demand in terms of ... *These are follow-up-questions only for content or user interface related interviewees,*
... -> fill in the trends, functionalities interviewee mentioned

5.B3. What problems and chances could ... bring?

5.B4. Do you know specific trends of user habits related to the TV experience?

Questionnaire - Part 2 PRESENTING LINKEDTV

Intro Part II:

Thank you for answering the first more general and background related questions. In the next part we would like to present you a demo of LinkedTV. It should give you a more detailed understanding of our project.

Interviewer instruction: Presenting the LinkedTV project to the person.

Do you have any questions related to the demo or LinkedTV itself?

Questionnaire - Part 3 SPECIFIC QUESTIONS ON EXPERTISE AREAS related to LinkedTV**Intro Part III:**

Now that you have a better understanding of the project itself, we can continue with some questions closely related to the project.

Questions marked with T (Tech people)

Questions	Interviewer instructions
	<p><i>General interviewer instruction: If interviewee mentioned multiscreen as a trend -> Just before you have seen the demo you talked about the upcoming trend of multiscreens. -> continue with T1</i></p> <p><i>If interviewee not mentioned multiscreen as a trend -> Just before you have seen the demo you talked about upcoming trends. We would like to add the trend of multiscreens. -> continue with T1</i></p>
<p>T1. What experiences or challenges from multiscreen development might be relevant to LinkedTV?</p>	
<p>T2. If you keep in mind the demos you saw, are there any features you would be especially interested in? Which ones? And why?</p>	<p><i>If so: continue with the area interviewee is especially interested in. Ask him about related experiences to LinkedTV in the mentioned area, eventually upcoming problems or solutions and chances. If it is enrichment, analysis or licensing, add the special questions of those areas.</i></p> <p><i>If not: continue with the interview as follows</i></p>
	<p><i>General interviewer instruction: mention that LinkedTV has 3 main technical issues we would like to underline: The first one is enrichment of content, the second one is related to platform licensing and the last one is analysis methods like speech recognition, visual analysis and face recognition.</i></p>
<p>T3. Do you see more issues you are experienced in, that are relevant to LinkedTV?</p>	<p><i>If so: Which issues would you mention? What would you recommend LinkedTV regarding this issue? Where do you see challenges? How did you handle those challenges?</i></p>
	<p><i>Interviewer instruction: explain that the next questions will be related to each of the main technical issues, beginning with enrichment.</i></p>
<p>Enrichment</p>	
<p>T4. Do you have experiences with enrichment of content e.g. semantic web technologies or similar technologies?</p>	<p><i>If so: What kind of content enrichment was that? What kinds of content did you work with? Who was responsible for the enrichment?</i></p>
<p>T5. Do you know any similar projects where a third party provider is analyzing</p>	<p><i>If so: Could you name examples? What did they analyze? How did they analyze the content (e.g. shot</i></p>

content for a broadcaster? *and scene detection, concept detection, linking information sources to the content etc.)?*

T6. What is your opinion, which material type might be appropriate for LinkedTV? Which material type would you suggest: news shows, documentation, reports, parliament debates or others? Your personal choice regarding a specific show ?

T7. Do you have experiences with enrichment on the basis of LoD (Linked open data cloud) ? *If so: What do you think in the context with LinkedTV, is it mature enough to provide good background materials to end users?*

Licensing

T8. Do you have experiences in platform licensing problematics? *If so: Do you have experiences with end-to-end systems, modular licensing or both?*

T9. With your experiences, what would you suggest for LinkedTV? Can you imagine buying/selling an end-to-end system or would you suggest a modular licensing ?

T10. What should LinkedTV take into account regarding licensing when offering (parts of) the system on the market ?

Analysis

T11. Do you have experiences in technologies like speech recognition, visual analysis or face recognition? *If so: Do you believe that these technologies are mature enough to provide sufficient good media fragments for LinkedTV compared to subtitles, which always do have good quality?*

T12. Did you face problems in similar projects that could help LinkedTV ?

Questions marked with B (Back-End people: experts, who can focus on the user application and content aspects of the LinkedTV project)

Questions

Interviewer instructions

General interviewer instruction: If interviewee mentioned multiscreen as a trend -> Just before you have seen the demo you talked about the upcoming trend of multiscreens. -> continue with B1

If interviewee not mentioned multiscreen as a trend -> Just before you have seen the demo you talked about upcoming trends. We would like to add the trend of multiscreens. -> continue with B1

B1. What experiences or challenges from multiscreen development might be relevant

 to LinkedTV?

B2. Please keep in mind the demos of the linked news scenario from RBB and “Tussen Kunst & Kitsch” (internationally known as “the Antiques Roadshow”) you saw. Are these scenarios relevant in your opinion if you think of current market trends and user behaviors? *If not: Why? What features are you missing?*

B3. Do you see any problems with these scenarios, regarding practical issues, legal, etc..? *If so: What issues do you see? Could you explain why you named those issues? Do you have similar cases in mind, you are referring to? Which cases*

Interviewer instruction: explain that you would like to discuss 4 main issues of LinkedTV: Content enrichments, recommendations, editing and ethics. The next questions will be related to each of the main issues, beginning with enrichment.

 Enrichments

B4. Do you have experiences regarding user interest or demand in receiving additional information related to a TV program or video while watching or for referral after watching? *If so: Which experiences or examples could you name?*

B5. In your opinion, what type of information viewers of (informative/documentary) programs are most interested in (e.g. Wikipedia links, links to other videos etc.)? *If so: Which types are most relevant? What are your suggestions based on (survey etc.)?*

B6. Do you have experiences regarding users' information overload?

 Recommendation

B7. Do you have experiences regarding personalization for users? *If so: Which experiences or examples could you name?*

B8. Do you know how important personalization for users is? *If so: Do you offer your users (viewers) recommendations, suggesting content that may be of interest to them?*

 Editing, Curation and Management

B9. Do you have experiences regarding filtering, organizing and editing the content for users? *If so: What kind of tools would help you in filtering, organizing and editing the content? What is your impression, how many annotations per scene / show would you like to have? How many annotations per scene / show would you like to have? Would you like to use annotated and analyzed content to search for related content within your own database?*

 Ethics, Law and privacy

B10. What legal and ethical problem do you see with LinkedTV?

If so: Which problems do you see? Do you think you might encounter problems using the personal interests of users to tailor the enrichments?

B11. Do you have experiences regarding acceptance of storing user profiles?

If so: What kind of regulations do you have to follow to ensure user privacy?

Questions marked with F (Front-end people)

Intro Front-end:

Thank you for your professional point of view. At the beginning of the interview you mentioned, that you sometimes consume Web based content on your TV or parallel to watching TV. Therefore in this last section we would like to ask for your personal opinion as a potential end user of LinkedTV.

Questions

Interviewer instructions

F1. How would you imagine to use LinkedTV? (e.g. would you be in the living room? what devices would you use, what program or show would you watch, what additional information/content you'd like to explore)

If not: Reasons why not?

If time: use the following topics to enrich the imagined scenarios:

- *Interface and enrichment problematic: e.g. Would you like to control which kind of enrichments (e.g. shows, Wikipedia, websites, pictures, short clips) are offered to you ?*
- *Recommendation and Personalization: e.g. What kind of recommendations would you expect from a TV?*
- *Individual addressability of users: e.g. Have you ever discussed with your partner/spouse/kids about what to watch on the TV?*
- *Ethics, Law, Privacy and incognito model: e.g. Would you like to control / see what kind of information the system has gathered about you?*
- *Trends: Second screen?: e.g. Assuming a show you like to watch on TV would offer you a second screen application, would you intend to use it?*
- *Content: What kind of shows (news, music, education..) can you imagine to consume on LinkedTV?*