This document gives an overview on the pilot 3 results. It covers: a) the description of the three prototypes, b) the methodology c) the results on requirement, conceptual and functional level.
Basic Information

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Document Revision History

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EXECUTIVE SUMMARY

This deliverable reports on the results of pilot 3. In this final pilot, three prototypes were tested: the platform-centric prototype, the broadcaster-centric prototype and the brand-centric prototype. In total, **658 users** participated in the evaluation. On one hand, pilot 3 aimed to test and validate the HRADIO concept with a large population and mimicked a real app experience as if the app would be available tomorrow. On the other hand, pilot 3 aimed to support broadcasters in developing a near-to-market product. It was therefore decided that the platform-centric prototype, including most of the HRADIO features, should be tested in an open pilot. Given the sensitivity of testing with real end-users and the more experimental nature of some of the features (compared to the platform centric app), the brand-centric (VRT) and the broadcaster-centric prototype (RBB) each focused on the requirements of their target group in a more controlled setting. The difference between the two is that, due to temporary technical restrictions (RBB doing maintenance work on their EDI stream), the broadcaster-centric app was tested with recorded content. However, testers also tested the prototype at home in a 10-day trial, in order to also experience it in a real-life setting, as was the case for the open pilot.

The **platform-centric prototype** was tested in Germany and Belgium by 456 users, including 190 users from Germany, 195 users from Belgium and 139 users from other countries (Netherlands, UK, US, France, Bulgaria, Turkey and others). The prototype included different HRADIO features such as service recommendations, substitution and timeshifting. In addition, 21 respondents from Germany and Belgium tested the cross-device functionality, which focused on a hybrid radio offer on various platforms (phone, tablet and desktop). This was tested in a closed setting (in-lab).

The **brand-centric prototype** consisted of daylist (product from pilot 1), recommendations, favourites and timeshifting. The prototype focused on one channel (Radio 1), and is an improvement of the Radio 1 Select app. The difference with Radio 1 Select is that the brand-centric prototype provides a selection of on-demand radio items (spoken word) in a playlist to help avoid choice overload, while
also including OMRI timeshifting features. The prototype was tested by 152 users in Belgium with the addition 10 in-depth interviews.

The broadcaster-centric prototype offers multiple radio stations from one broadcaster (in this case RBB). Key features in this prototype are timeshifting, song substitution, bookmarks and additional content (weather, traffic, info). The prototype was tested in Germany by an RBB panel of 50 users, of whom 34 provided feedback via survey and 11 were interviewed in-depth in a focus group.

The following table provides an overview of the various evaluation activities for the tested prototypes. The platform and brand-centric prototype focuses on logging data, survey and interviews. The broadcaster-centric prototype only tested recorded content, and therefore does not include logging data, hence a strong focus on the survey and focus groups output.

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1 4 of 10 interviews took place with participants who had not opened the application before being contacted. The reasons why they did not use the app contributed important insights.
Table 1: Overview pilot 3 evaluation

<table>
<thead>
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<th>Platform-centric prototype (GE, BE)</th>
<th>Brand-centric prototype (BE)</th>
<th>Broadcaster-centric prototype (GE)</th>
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<tr>
<td><strong>Activities</strong></td>
<td><strong>Activities</strong></td>
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</tr>
<tr>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>56-day trial with monitoring and analysis of logging data</td>
<td>56-day trial with monitoring and analysis of logging data and weekly surveys</td>
<td>10-days trial with pre-recorded content</td>
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<tr>
<td>456 downloads</td>
<td>152 downloads</td>
<td>50</td>
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<tr>
<td>Open call with immediate access to prototype</td>
<td>Drop-off survey</td>
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<tr>
<td>456</td>
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<td>Focus group</td>
</tr>
<tr>
<td>21</td>
<td>10</td>
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This deliverable provides a detailed overview of:

- The overall evaluation of the prototypes (chapter 3)
- Final conclusions on the user evaluation of the concept of hybrid radio (chapter 4)
- Overall overview of the HRADIO pilot evaluation results throughout the project and final conclusion of the evaluation. (chapter 3 & 4)

The deliverable concludes with the ten main findings from the final stage of the HRADIO user research, which in all was performed over almost 3 years and divided in three pilot phases:
1) **Hybrid radio’s unique value is the ‘mix’ of on-demand with live radio.** Previous research has shown that certain types of radio items that are characteristic for traditional radio are lost when listening non-linear. Pilot 3 confirmed this requirement, we learned that users value traditional broadcast radio in combination with hybrid radio features such as daylist, timeshifting with a timeslider, content (song and additional content) substitution and favourites. For hybrid radio, more research is needed in terms of how a high level of on-demand content can still be blended with live radio aspects, without overdoing it nor losing the connection with live radio.

2) **Hybrid radio should consider different listening modes, user context, active versus passive features and decision moments.** We notice in general that less people tend to listen to traditional broadcast radio but are pleasantly surprised when re-connected or re-introduced to the surprise effect radio can offer. Radio as “background” entertainment remains therefore important and should also be considered in the development of novel HRADIO features. In that regard, we discovered that there are still multiple radio listening modes, regardless of the “on-demand” reality. Considering the variety in radio listening modes is important when developing a hybrid radio application and features. The use of **listening profiles** in the settings was also a user requirement that resulted from the user testing.

3) **Hybrid radio should invest in offering a flexible user experience on multiple platforms.** Speaking of different modes of listening and coming back to the platform-centric prototype, hybrid radio in car is highly appreciated by users, especially to visually see what is playing, to intuitively switch between channels, receive recommendations according to location and receive news, weather and traffic updates is what listeners define as the radio of the future. In general, **connecting with users ‘on the go’** still has lots of potential compared to existing (radio and/or streaming) applications. The **cross-device functionality** developed in pilot 3 is already a nice solution in that regard. Another interesting user insight is the importance of the offline aspect and to be able to download and access content offline. But not only on the go, also when at home, users expect to access content via multiple screens (Smart TV). The flexibility and compatibility here is also an important one to consider.

4) Good signal and audio quality is crucial for radio. The requirement of optimal signal quality was a condition sine qua non when developing hybrid radio applications. Users expect an excellent audio quality at all times.
5) **Hybrid radio should consider high user expectations based on users’ experience with other applications in different (entertainment) domains.** For example, users expect to have similar features as streaming applications nowadays offer for podcasts (e.g. library, favourites, return back, next show, recommendations). In general, throughout the pilots we see that radio listeners (regardless from which profile or current listener behavior) expect HRADIO to offer numerous possibilities in accessing, editing and relistening content. Key features developed here are to return to the beginning of a program, to pause and rewind content, to have advanced search possibilities and to access lists of favourites and stored content (music, programs, news and other audio content). Users like to get a personal playlist as a ‘catch-up’ of what they have missed during the day.

6) **Simplicity and straightforwardness is still the general rule.** Future radio businesses can offer high value if they find the right formula to offer users numerous varieties of on-demand versus live radio in a nice, clear and straightforward way, therefore the ‘now playing’ or sometimes called ‘what is it about’ feature is highly important for users. This in terms of the ease of use, possibilities and flexibility the features should have. Clear visualisations of different segments of radio content is an example of a frequent mentioned user requirement.

7) **The most valuable learning is that the novelty factor of hybrid radio features requires extra guidance in terms of user manuals, intuitive UI and UX experiences.** Furthermore, pilot 3 especially taught us that users need time to appropriate hybrid radio prototypes and features to make it their own. Clear instructions on the affordances of the functionalities and on how to use them are therefore essential. Users should also be able to test and explore the application for a longer period of time. This was the case in pilot 3, but the immaturity of the prototype hindered the user experience. As users installed a real application, even with the disclaimer of it being a test, they still expected it to be fully functional without any technical flaws, which was not the case.

8) **Hybrid radio should consider privacy, control and transparency.** Although users expect a certain level of convenience they prefer control. They would like to be able to tweak their playlist to their preference. (e.g. rearrange radio items, like or dislike items to feed the recommendation engine...). The importance of personalisation is therefore also the common thread throughout the HRADIO project. An important learning for this project is that clear and accessible user settings (e.g. opt-in, opt out) are helpful here. Developers and researchers should devote sufficient time to study how this
can be provided to users in the best possible way. It should in this sense also be stressed that it should remain a combination of both worlds and users expect that this will not influence their relation with live radio and the broadcast experience. An example of this is the need for a ‘bring back to live’ button, an alarm or a clear sign of what is still going on while listening to a skipped song. Linked to this, we see that users also express the need for control on other aspects, especially as a need for receiving sufficient information on the context of this dual relationship (why, what, how, who is storing and owning this data). Transparency is key when broadcasters decide to link with 3rd party applications. In addition, broadcasters and radio developers should consider that a choice for a particular platform will always exclude a certain number of users. Sufficient research on this is therefore needed.

9) **Hybrid radio should be social.** Interestingly, the social aspect (to share radio content with friends) is a returning user requirement. This was studied in depth in pilot 2, where users on the one hand would like to have a closer connection with the radio presenters via the use of social media (e.g. twitter, polls of song) but equally and finding from pilot 3, users expect to share content with friends/family and in some cases other listeners (from pilot 1 and 2 learnings).

10) **Hybrid radio should be for free, with an option for a premium account that considers the current package of competing streaming applications.** With regard to learnings related to pay models (premium version) and advertising, we learned that current subscriptions (such as with Spotify) are mainly used to avoid advertising and not necessarily to access different or novel features.

From our evaluation, it is clear that there is a potential for hybrid radio. We should keep in mind that the user acceptance will also depend on how radio is currently used by the audience. In the case of radio in a pure background mode, people will be less inclined to make use of hybrid radio features that require (inter)activity of them. Nevertheless, we did notice a lot of enthusiasm for a more personalised and tailored radio experience and specific validated user scenarios support this need. This indicates that radio, as the most traditional medium of our time, is also ready to enter the digital era.
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<tr>
<td>CPN</td>
<td>Content Personalisation Network</td>
</tr>
<tr>
<td>DAB</td>
<td>Digital Audio Broadcasting</td>
</tr>
<tr>
<td>DABoverIP</td>
<td>Digital Audio Broadcast over Internet Protocol</td>
</tr>
<tr>
<td>DL+</td>
<td>Dynamic Label Plus</td>
</tr>
<tr>
<td>EDI</td>
<td>Electronic Data Interchange</td>
</tr>
<tr>
<td>LL</td>
<td>Living Lab</td>
</tr>
<tr>
<td>OMRI</td>
<td>Open Mobile Radio Interface</td>
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<tr>
<td>EPG</td>
<td>Electronic Programme Guide</td>
</tr>
<tr>
<td>RSS feed</td>
<td>Really Simple Syndication</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Sized Enterprises</td>
</tr>
<tr>
<td>UI</td>
<td>User Interface</td>
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1. INTRODUCTION

The third and final pilot phase aimed to test and evaluate the full HRADIO service as developed throughout the project. To do so, we built on input gathered during the previous two pilot stages to finally develop three final prototypes. The testing of these prototypes took place in various pilot countries with a panel of 658 end users, consisting of radio listeners as well as non-radio listeners.

This deliverable reports on the procedure, relevant outcomes and final recommendations on the HRADIO service. It starts by describing the three prototypes and the methodology used to test these prototypes. Second, the evaluation of the prototypes is discussed. The evaluation entails an overview per HRADIO prototype and its features, with lessons learned on concept and functional level. To conclude, a summary is provided on the lessons learned, opportunities and challenges for future work.
2. THREE PROTOTYPES

2.1. MAIN GOAL OF THE PROTOTYPES

HRADIO focuses on offering new and interactive radio experiences to listeners. HRADIO’s main ambition is on one hand to create a trusted and familiar radio environment and, on the other, to enhance the radio experience with personalised innovative services. Throughout the project, user research guided the development of this HRADIO service and informed the design according to radio listeners’ needs and habits.

To test the final HRADIO service, 3 prototypes were developed. The idea was that each prototype offers a complete service with a variety of HRADIO features. By testing multiple prototypes, learnings from various angles were gathered resulting in a more elaborate understanding of the acceptance rate of the various HRADIO features. Examples of these personalised radio features are visualised radio streams, timeshifting, recommendations, content substitution and favouriting radio programs or songs liked by the listener. The final goal of HRADIO is to publish these developments as ready-to-use Android- and HTML client-implementations including an extensive set of well-documented APIs fostering new service developments for the radio sector.

The visual below illustrates how the prototypes and the included features were developed throughout the project. These are the end result of multiple iterations with both professional and end users in previous stages of the project. In the planning deliverable 5.1 3rd Pilot Execution & Evaluation Plan more detailed information is provided on the process of developing the prototypes and the included features (from pilot 1, to pilot 2 and eventually pilot 3). In the next section, the set-up, purpose and features of each prototype are discussed in greater depth.
2.2. DESCRIPTION OF PROTOTYPES

The HRADIO prototypes all include the same standard HRADIO service. All prototypes offer users live radio combined with on-demand functionalities such as timeshifting, favouriting content and a visual representation of what is playing.

In addition, each prototype has a unique focus.

2.2.1. Platform-centric prototype

The platform-centric prototype offers listeners access to radio and HRADIO services on different devices (e.g. tablet, smartphone...). Users can access radio channels without geographical boundaries, save and store favourite songs and

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2 In pilot 1, different hybrid radio scenarios were converted to 7 hybrid radio products (see left side of the graph), project partners decided to develop 6 of the 7 products, these 6 were tested by small groups of users, professional and friendly users. In pilot 2 learnings from the 6 tested products resulted in the development of a mobile and car application with each a different combination of the 6 products, that were renamed as features (see middle part of the graph). Finally, user learnings from pilot 2, resulted in the development of three prototypes, a generic and two broadcaster prototypes; the platform-centric, the brand-centric and broadcaster-centric prototype.
programs and re-listen to songs and podcasts whenever they prefer. In this regard, an additional service was developed that allows listeners to link their Spotify account to the application and substitute a radio item (song or program) with one or more songs of their favourite playlists. In addition, listeners are prompted to try out new channels by in-app recommendations. When listeners want to access radio on a different device (e.g. switch from their smartphone to their car radio), a newly developed cross-device feature enables ‘continuous’ listening on the other device based upon the users’ unique identification; this was tested in a closed setting.

Figure 2: platform-centric prototype

In Table 2, which represents an update of the planning deliverable table, concrete definitions of the tested features are provided. It should be noted that, different from what was stated in the planning deliverable for the German part of the pilot, server-based time shift was activated for the whole regional multiplex of IAB member Bayerischer Rundfunk.
Table 2: Feature table platform-centric prototype
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<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Menu</td>
<td>The menu from pilot 2 is also deployed in the 3rd pilot and features the same functionalities, improved following pilot 2 feedback.</td>
</tr>
<tr>
<td>What is it about?</td>
<td>The service list is identical to the one of pilot 2. Users view an A-Z list of all available services and DAB-over-IP streams, it distinguishes between DAB streams and IP streams.</td>
</tr>
<tr>
<td>Service search</td>
<td>Allows the users to search by name, genre, organisation, program and location and contains sophisticated federated search configuration options. These were added based on pilot 2 comments where the need to elaborate the search function for genre, topics, etc was addressed.</td>
</tr>
<tr>
<td>Recommender</td>
<td>Transparent &amp; controllable station recommendations (settings menu provides information and configuration options for each recommender module) are provided. Pilot 2 taught us that users highly value transparency and control. In addition, there is also increased service coverage (more services are part of the platform, and the recommender coverage was increased due to the availability of different recommendation strategies based on audio features, keywords, trends and expert opinions). New compared to pilot 2 is also the programme item recommendation: Listen to a Spotify podcast recommended based on the content of the currently-running programme.</td>
</tr>
<tr>
<td>Channel screen</td>
<td>Identical to pilot 2, the channel screen provides a way to see all important information about the currently played stream. This includes information about the currently played song, show or a general segment. The information will be displayed to the user in several activatable lists. Besides information, the channel screen also provides a way for users to activate more advanced features of pilot 2 e.g. Timeshifting and Substitution.</td>
</tr>
<tr>
<td>Favourites</td>
<td>Users can favourite individual items e.g; songs, podcasts. For Pilot 3, the user interface changed to a heart icon. The favourites are also linked to a Spotify playlist, the ‘favourite list’, a user requirement from pilot 2.</td>
</tr>
</tbody>
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### Timeshifting

The timeshifting features have been updated for Pilot 3 and now include rewinding, pausing/resuming a DAB stream, and returning to the live stream. The control and handling of the timeshifting is done by intuitive shifting via a slider control (to indicate how far a user can shift in time).

In addition, and based on pilot 2 findings, users are able to substitute unwanted content/segments of a program with an individual item from a streaming provider, in this case Spotify. The user is also offered an own created playlist with all skips included, e.g. the 'blacklist'.

It should be noted that server-based timeshifting was only available for Radio 1 in Belgium, due to technical constraints. For the German part of the pilot, server-based time shift was activated for the whole regional multiplex of IAB member Bayerischer Rundfunk.

For the cross-device switching feature, available only for the workshop but not for the open pilot, users are able to listen to timeshifted content from different devices.

### Music substitution

Music Substitution describes the feature for replacing the currently played segment of the stream, whether timeshifted or not, by a predefined selection of different segments. As mentioned already, users are able to skip content that is added to a Spotify blacklist (see timeshifting).

### Podcast integration

Users are able to play available podcasts for a specific programme directly from the EPG or RSS Feed.
User data collection
User data is collected via questions in the start screen, for an LMU use case on control and transparency of user data. Demographic data was collected that could be used for the reporting, users can configure this in the settings menu.

Car player
A simplified UI dedicated to in-car usage. For safety reasons, this was only available for participants who joined the workshop in BE and DE.

Guaranteed signal quality
The app has tried to switch over to another available reception possibility if one fails. E.g. DAB → EDI → ShoutCast.

2.2.2. Brand-centric prototype

Parallel to the platform-centric prototype, the two broadcasters involved in HRADIO (VRT and RBB) each provide a personalised app with the HRADIO services included, both with a slightly different focus.

The **brand-centric prototype** focuses on bringing a station (or brand) specific experience to the user. Pilot 2 showed us that users are very interested in on-demand content and having a personalised schedule offered in the app. Since this links with the Daylist product defined in pilot 1 and is in line with the VRT’s product development strategy, this prototype is VRT branded. The prototype has one dedicated channel (Radio 1). “Radio 1” is a VRT radio channel that guides its audience through the news and inspires people with new discoveries, insights and experiences. The app combines live radio and timeshift experiences with an on demand catch-up service (‘Daylist’). Daylist offers a personalised list of ‘snackable’ radio items. These items are parts of an aired radio show hosted on the current Radio 1 Select platform. Instead of having to relisten to a whole show, the users can now browse through parts of the show that particularly interest them. Also, the user can browse through a selection of on-demand items related to the live broadcast. Besides timeshifting, other HRADIO functionalities such as favourites and recommendations are included.
Below is an overview of the included features. It should be noted that not all features were available for all users due to a difference in operating systems. For iOS users live radio was not available, which means they could not timeshift and the app couldn’t show relevant related fragments based on the current live radio show.
Table 3: Feature table brand-centric prototype
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
</table>
| Daylist (= on-demand radio 1 content) | In pilot 2, users made the remark that they would like to have an overview of all the content they just missed in order to listen to their favourite items. This need was addressed by Daylist. The brand-centric prototype builds upon the Daylist concept which is a personalised playlist of radio 1 fragments. 2 methods of personalisation are implemented and A/B tested in the final pilot.  
A. The user selects the amount of time he/she has and the categories of interest.  
B. The user gets recommendations based upon his/her listening behaviour. For this, VRT is using a content-based recommendation engine developed within another H2020 project VRT is involved in (CPN) |
| Recommender             | By using the metadata that comes with the programme details from RadioEPG, the app shows relevant radio fragments related to the current live radio show. |
D5.3: Final report on pilot evaluation

Timeshifting

The timeshifting is server-based, this is the same for the platform-centric app and was new for pilot 3. When the user tunes in to the live radio, they immediately have a buffer of 2 hours of radio available for rewind. Timeshifting is achieved by simply pausing the radio, but also by tapping on a Dynamic Label in the timeshift buffer. These are key points where an item started and these are rendered in the interface under 'Net gemist (just missed)' in the live radio detail screen.

For this pilot, there has been some effort at VRT to get the correct Dynamic Label+ (DL+) into the DAB+ stream. Before, there were only Dynamic Labels (DL) without the granular metadata DL+ offers. In order for the time shift to work we needed DL+ with the correct toggle bits in the metadata. Because this is a live environment, VRT needed to proceed with caution on this and was only able to have DL+ for song items, not for items like top of the hour news or traffic. The songs provided eventually enough skipping points in the stream to validate the concept, although it was perceived by some users as a playlist of songs instead of a time shift feature.

Favourites

On-demand radio fragments can be added to a favourites list for easy reference.

2.2.3. Broadcaster-centric prototype

The broadcaster-centric prototype was developed by Konsole. The application allows users to listen to various radio stations delivered by a single broadcaster. Information derived from Pilot 2 showed that listeners highly value such a broadcaster radio application with multiple channels. Pilot 2 also showed that more effort should be put into developing a user-friendly and easy-to-use application. The broadcaster-centric app therefore focuses on this information.

For this test set-up two broadcaster channels were available. In principle, the application should contain all radio stations offered by one broadcaster (= broadcaster-centric) in one application. However, to limit development time the application for the user test had only two different channels to choose from – one
was the radioeins live programme and the other was the “radioeins Pilot”. For the project, it was very valuable to have these different streams, one with and one without the new HRADIO features since users could compare the two different streams. During the focus groups users were further questioned about their interest in having multiple radio channels included.

The broadcaster-centric app includes the following HRADIO features; additional programme information, timeshifting, content substitution via Spotify, additional content and bookmarking to listen to content on demand. In the table below a full description is provided. Different from what was stated in the planning deliverable, there was no podcast feature tested, but users could rewind 15 seconds and a carousel timeshift element was added.
Figure 4: screenshots 'choosing radio stations' function
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu</td>
<td>After starting the demo application, a channel overview with all RBB channels was displayed. For the user test, there was one live stream and one test stream.</td>
</tr>
<tr>
<td>Channel screen</td>
<td>The Channel screen provides all important information about the currently played stream. First is the general player control. Here the title, artist and show name of the currently played stream are displayed. (see additional programme information in the table). Additionally the player control provides buttons for starting and stopping the stream, timeshifting 15 seconds back or to live, substituting the currently-played track and bookmarking a current track. (see timeshifting, content substitution and bookmarking in the table). Secondly a new timeshift control slider is added to the player control. It provides an easy way to search through the stream and simultaneously show the different segment types available. The different segment types consist of: Music, General News, Weather News and Traffic News, Advertisements and general Show News. (see timeshifting in the table). This is also used by the platform-centric and brand-centric app. Different from stated in the planning deliverable, The third UI Element is a carousel with the last played news segments available in the stream. General News, Traffic News and Weather items provide a shortcut to the exact position in the live stream of the last played segment of this type. (See latest news, weather, traffic content in the table). And lastly the playlist shows a more in-depth overview of all available items of the current stream based on their segment type. Additional information for the segments consists of title, artist information and additional actions. (See timeshifting in the table).</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Co-funded by the Horizon 2020 Framework Programme of the European Union
What is it about? (= 'additional programme information' was used in the user test)

As soon as the user has selected the test stream, the stream starts in a player-centred view. Following the user’s feedback the player is moved to the top. Context information is displayed below the player. The player consists of the usual controls in the centre. Above the controls, details about the current content are displayed, such as information about the current show. In between there is a new horizontal timeshift slider. The slider shows the audio like a drawn waveform with event markings. (See timeshifting in the table).

Depending on the actual state, the user can start and stop the stream or skip (substitute) the actual item.

Timeshifting

There are three ways to activate timeshift mode: Horizontal timeline (= slider), Interactive playlist and 15 seconds-rewind. For RBB it is important to test these different modes with users, therefore extra attention is given to the user evaluation of these three different modes.

Timeshifting by clicking on song elements at the playlist below / Timeshifting metadata-based: During playback of the DAB stream, all associated metadata is collected and stored. This allows for skipping (timeshifting) at certain times within the stream being played, e.g. the beginning of a song.

Slide the horizontal slider and select a time position.

Click on one of the player buttons / Timeshifting time-based: Possible time-based timeshift interactions are: pause / continue, jump 15s back, jump to the beginning of the stream, jump to the live stream.
### Featured content (= 'Latest news, weather, traffic content' was used in the user test)

A slider is provided with the last played news segments available in the stream. General News, Traffic News and Weather items provide a shortcut to the exact position in the live stream of the last played segment of this type.

### Content substitution via Spotify

Music and spoken content substitution is the feature for replacing the currently played segment of the stream, whether timeshifted or not, by a predefined selection of different segments.

During pilot phase 3 we focus on substitution based on a preselected Spotify playlist. The user is able to log into their Spotify account and select a playlist with tracks they can substitute the currently played segment with. While playing a DAB stream, the user can press the substitution button and a randomly selected track from the specified Spotify playlist will play instead of the DAB-content. Once the Spotify track is finished, the livestream audio will resume. The livestream will be continuously analysed in the background via the app so new segment items are added to the list.

### Song bookmarking

Via a bookmark button the user is able to add items to a HRADIO playlist on Spotify.

### Podcast integration

Different from the planning deliverable, the podcast integration was not tested in this prototype. Since this feature is already tested by the platform-centric prototype, efforts were devoted to ensuring the usability of the other features.

Section 2.3 provides an overview on the methodology, and section 2.4 explains how these prototypes were tested and evaluated by users.
2.3. METHODOLOGY

In order to provide general conclusions on the final HRADIO service, we developed an evaluation framework in pilot 2 (see D5.1 2nd Pilot execution & Evaluation Plan). For pilot 3 we use the same evaluation structure, as can be seen in the figure below. More information on this evaluation framework can be found in the planning deliverable (see D5.1 3rd Pilot Execution & Evaluation Plan).

![Evaluation of the prototypes](image)

As can be seen in the figure, the three prototypes and the features are evaluated on 1) functional level, and 2) concept level.

As can be seen in the lower part of the graph, specific indicators are operationalised to measure the two levels; the functional level measures satisfaction, usefulness and ease of use. The second level measures the concept of hybrid radio (perceived added value\(^3\)). The specific features (i.e. how would you evaluate the experience? Which aspects do you like/dislike? etc.), as well as the prototypes as a whole (i.e. do

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\(^3\) This also included the definition and effectivity, these are specifically evaluated in pilot 2
you feel anything is missing? Are there features you would like to add? Would the HRADIO app fit into your daily routine?) are evaluated. Users are also generally questioned on privacy, their intention to use the app and customer value concepts (e.g. willingness to pay, willingness to share personal data)\(^4\). The latter is especially the case for the platform-centric prototype as the broadcasters, being publicly funded, are less interested in willingness to pay.

The functional level is informed by logging data and survey data\(^5\), and the concept level by survey data, in-depth interviews and workshops\(^6\). As mentioned in the planning deliverable (D5.1 3rd Pilot Execution & Evaluation Plan) the methodology of the evaluation for pilot 3 focuses on increasing numbers of participants and thus also on quantitative measures. As a consequence, certain statements of the concept level were incorporated in the survey and testers were questioned in-depth in additional interviews and workshops in Belgium and Germany.

The platform-centric prototype and the brand-centric prototype evaluate the two levels via logging data, surveys and interviews. The broadcaster-centric prototype, is tested in a closed set-up and evaluated via survey and workshops. The survey structure is aligned for the evaluation of all three prototypes and includes questions from pilot 2.

### 2.4. EVALUATION ACTIVITIES

The next section will describe per prototype the evaluation activities, also represented in table 4. For full details, we refer to D5.1: Pilot execution and Evaluation Plan (2nd version), release in May 2019. In the overview table, we also indicate which pilot activities were added or adjusted.

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\(^4\) In the figure this is added at the concept level since it links best with this part.

\(^5\) The logging data explains what testers did during the pilots, the survey data explains how the testers evaluate their usage of the app and the features. This is linked to the functional level, the left column of the graph.

\(^6\) The survey data also includes concept-related questions and open comment sections that ask users to evaluate the app in relation to daily habits and expectations. In addition, the in-depth interviews and workshops are used to provide more context. This is shown in the righthand column of the graph.
Table 4: Overview activities executed, added and adjusted
<table>
<thead>
<tr>
<th>Planned evaluation activities executed</th>
<th>Platform-centric prototype</th>
<th>Brand-centric prototype</th>
<th>Broadcaster-centric prototype</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 200 recruited participants</td>
<td>- 50 recruited radio 1 listeners</td>
<td>- 50 recruited participants</td>
<td></td>
</tr>
<tr>
<td>- 35 days of testing</td>
<td>- 35 days of testing</td>
<td>- 3 days of testing</td>
<td></td>
</tr>
<tr>
<td>- logging data</td>
<td>- logging data</td>
<td>- Survey</td>
<td></td>
</tr>
<tr>
<td>- user reports</td>
<td>- A/B testing</td>
<td>- 11 focus group with end-users</td>
<td></td>
</tr>
<tr>
<td>- 50 survey responses</td>
<td>- Weekly in-app survey</td>
<td>- 35 survey responses</td>
<td></td>
</tr>
<tr>
<td>- 21 participants for cross device workshops</td>
<td>- 31 survey responses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planned evaluation activities - not executed</th>
<th>Platform-centric prototype</th>
<th>Brand-centric prototype</th>
<th>Broadcaster-centric prototype</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 50 survey answers and cross device workshop participants less than planned 100 for survey and less than the planned 40 for the workshop.</td>
<td>- 19 survey answers less than the planned 50</td>
<td>- 15 survey answers less than the planned 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Comparison of user data with similar user data of the radio 1 Select app. The dataset we received was too small and aggregated to be used in a comparison.</td>
<td>- Final professional workshop is postponed to after Corona</td>
<td></td>
</tr>
</tbody>
</table>
### Additional evaluation activities

- 256 more participants and logging data
- 21 extra days of testing
- Fb ad recruitment
- In-app survey
- Data protection declaration clarified before starting the test with the data protection officer, textual explanation is part of the demo application
- Joint Agreement between IRT, LMU and VRT on processing in accordance with Article 28 General Data Protection Regulation (GDPR)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>102 more participants and logging data</td>
<td>7 days extra testing</td>
</tr>
<tr>
<td></td>
<td>21 extra days of testing</td>
<td>Onboarding slides</td>
</tr>
<tr>
<td></td>
<td>iOS prototype</td>
<td>Data protection declaration clarified before starting the test with the data protection officer of RBB; textual explanation is part of the demo application</td>
</tr>
<tr>
<td></td>
<td>10 in-depth interviews that were not planned</td>
<td>Joint Agreement between RBB and Konsole Labs on processing in accordance with Article 28 General Data Protection Regulation (GDPR)</td>
</tr>
<tr>
<td></td>
<td>Data protection declaration clarified before starting the test with the data protection officer, textual explanation is part of the demo application</td>
<td></td>
</tr>
</tbody>
</table>
The **platform-centric prototype** was tested in an open pilot from the 23rd of December 2019 until the 17th of February 2020 in Germany and Belgium. In order to make sure people were notified of the open pilot, Imec, VRT, IRT and LMU divided efforts to disseminate the public link for the Google Playstore via public and private networks. During the pilot, two Facebook Ads were commissioned to increase the amount of user numbers.

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7https://play.google.com/store/apps/details?id=lmu.hradio.hradioshowcase&fbclid=IwAR0L9OzCPzWiyzNnr8ZxyaHxZVwnb0HsFFbKzqJq-RKYXMsHO3IVu1wvJA
Want to test radio of the future? check out the app at https://play.google.com/store/apps/details...

Figure 6: Facebook Ad

For the **evaluation of the platform-centric prototype**, the logging data was accessible via the Kibana visualisation tool\(^8\). Second, in-app questions asked users
to evaluate certain features. An additional question asked users who re-used the app after a long period of inactivity why they did not use the app during a longer period. Third, a final evaluation survey was hardcoded in the app. Finally, the workshop focusing on the cross-device functionality took place with 21 users who were employees of IRT and imec, but who were not related to the project.

![Figure 7: logging data Kibana tool](image)

The pilot of the **brand-centric prototype** took place in Belgium from December 9, 2019 until January 31, 2020 as a semi-open pilot. To recruit participants, VRT innovation organised a call-to-participation via VRT’s recruiting platform, VRT Pilootzone. ([https://www.pilootzone.be/prototype/jouw-radio-1-daylist](https://www.pilootzone.be/prototype/jouw-radio-1-daylist)). A week later, on December 12, Radio 1 reposted this call-for-participation on their Facebook page and website. After registering, all participants received an email with more information, a link to the pre-survey and a link to Google Play Store (for Android) or TestFlight (for iOS), where they were able to download the application.
For the evaluation of the **brand-centric prototype** the logging data was collected via the EBU Peach platform that tracks media events. We started off with a pre-survey that included questions about socio-demographics and their radio listening behaviour. During the test period we launched two in-app surveys. The final evaluation survey was sent via email with a Qualtrics link included, this was the same survey sent to testers of the platform app and broadcaster-centric app. (see annex) As explained in the planning deliverable, participants were divided into two random groups. Both groups received a personalised list of items, called "Today".

- **Group 1** had a lean-forward experience, participants had to choose their preferences manually. There were two options to filter the items: interests (sports / politics / science / society) and time-to-spend (figure 1).

- **Group 2** had a lean-back experience, they received suggestions based on their listening behavior by a ‘content-based’ recommender.

VRT’s goal was to compare the user experience in both settings.
As can be seen in the overview table, 10 extra interviews were conducted that were not included in the planning deliverable. The goal of these interviews was to gain a more in-depth understanding of the user experiences related to the app-use. The questions were based upon the survey results and logging data. The topic list can
be found in annex.\textsuperscript{9} Respondents were recruited via email. The interviews lasted on average 30 minutes and 22 seconds, and were transcribed by the interviewer.

The \textit{broadcaster-centric prototype} took place in Germany between February, 14. until 23., 2020. To recruit participants, RBB used their own database of available potential respondents.

Three hours of broadcasting were pre-recorded and made available in the German version of the mobile application. Testers were instructed to test the application for several hours for 10 days in total. The testers received access to the HRADIO Android application “HRADIO Demo” and installed it on their mobile device to test the application at home. As described in the prototype description, two channels were available to test. In the instructions it was clearly indicated that the testers should test the new functions in the “radioeins Pilot” and could compare the new functions with the standard radioeins channel. After the test, testers received an email with the final evaluation survey.

In addition, all interested participants were invited to take part in a focus group session at RBB. Despite projections in the planning deliverable, several smaller sessions were organized instead of one session due to planning difficulties. In small groups (3–4 participants), the testers discussed their experience using the HRADIO mobile app and exchanged opinions. Testers were also asked to compare the different streams and provide feedback on this experience. The workshop took

\textsuperscript{9} In addition, the learnings from these interviews were used as input for the digital radio production team for further development and personalisation of the Radio 1 Select app (radio-on-demand platform). The questions were therefore also based on previous research on music recommendations of Spotify (Hosey et al., 2019).
about 2 hours. The testers received incentives for the workshop and had a chance to win a RBB surprise package for the test at home.
3. PILOT PHASE 3: USER EVALUATION

This section reports on the results of the user evaluation of the different prototypes. First, general results on the prototype are provided. Secondly, there is an in-depth analysis of the evaluation of the prototype features. Third, we conclude with the most interesting findings and some lessons learned.

The reporting on the results is structured so that it covers both the concept and functional level; for each prototype there is a general section explaining first general user insights on the concept of the app. After this the features are discussed more in-depth by looking at

- how users used the feature (logging data);
- how users evaluate their usage of the feature (survey);
- what explanations users provide (interviews)

3.1. PLATFORM-CENTRIC PROTOTYPE

The platform-centric prototype focuses on providing radio channels from multiple broadcasters and for numerous platforms (mobile, tablet, desktop). In the app users tested a search functionality, timeshifting, recommendations, music substitution and podcasts. In addition, a cross device functionality was tested during workshops in a closed setting and is also reported on in the results section.

3.1.1. Participants

The goal for this open pilot was to receive at least 200 users across the different countries. This we achieved with 520 downloads.

The number of active users of the app is 284, this is 54% of the total amount of downloads. Active users are defined as such if apart from downloading the app, one or more actions (e.g. favouriting, rewind, ...) is performed by a unique user. Although we counted on more active users, this response rate is not necessarily unusual (e.g. Habibipour et al., 2017). Some users only downloaded the app out of curiosity or to try it once, but it didn’t become part of their daily habits. However, to receive additional input on the “drop-out”, we asked in the in-depth interviews for additional explanations. One of these explanations is that “the first search screen of the app is perceived by users as complex and therefore demotivated users to continue using the app.” This is linked to the usability and user-friendliness of the app and is an important lesson for future developments.
The same counts for the response rate of the online survey. With 50 completed surveys, this is only 10.4% of the total amount of downloads (520), and 56.8% of the total amount of active users (284). Another explanation for limited response is due to issues with the hardcoded survey link and users that only joined in the middle of the pilot. These users immediately received the final survey link as first introduction to the app and therefore deleted the message to the survey.

Looking at demographics (see table in annex), participants are mainly male (45 of 50) and mainly middle aged, around 35–55. The youngest participant is 19, the oldest participant is 77 years old. We see more retired listeners than students participating in the study. For socio-economic demographics there is a mix in education level, from no degree to university level or PhD. The testers that provided feedback are from the different pilot countries, Belgium (21) and Germany (21), but also from other countries (X) they filled in the survey in English (8).

In addition to the survey, feedback on the additional cross-device functionality was provided by 23 participants (see table in annex). With P20–P23 we also held an in-depth discussion on how they perceived the application, their quotes are also added.

The reason why listeners downloaded the app is mainly because of an interest in radio. Furthermore, most of the listeners downloaded the app because of a link with either the project or friends, family, colleagues. Only 7 of 50 participants work in the radio industry. The app is therefore tested by a generic group of end-users.

10 We see following comments in the open sections “Did not use it, only know it from today”, (BE)/ “did not use it yet, but I did already fill in the survey”, (BE)
3.1.2. Generic prototype evaluation

Satisfaction, perceived usefulness and ease of use

The satisfaction rate is overall positive, we see that participants are in particular satisfied with the general concept of the application and the fun factor (20 of 39 participants that answered):¹¹

“All very practical and interesting” (M, 46, GE)

“The Spotify replacement brings a wow effect.” (M, 43, GE)

“It’s fun being able to repeat a song and to skip parts of the program you are not interested in. And to pause and resume the stream.” (M, 52, ENG)

However, we see a lower value when it comes to how useful the app is in daily life. From the open comments in the survey and the interviews we learn that technical issues with the app and the general ease of use interrupted the flow of testing the application which caused participants to stop using the application after a period of time. The satisfaction rate is therefore negatively influenced by the lack of

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¹¹ 20 of 59 respondents did not answer this question
perception that the ‘app works the way I want it to work’. The expectations were therefore only **partially fulfilled**.

“It is useful but its implementation makes it difficult to use.” (M, 43, GE)

The app seems useful but is currently confusing as I cannot seem to select multiple stations as favourite easily and it crashes whenever it asks me about delete services. and I would find it more useful if I get help finding a station. I tried to find a classical music station and I was not able to find it somehow. (F, 35, ENG)

Several features were not working properly, hence the negative evaluation about certain aspects. I especially would find most useful the following ideas: the possibility to choose on what variables the recommendation engine should focus (although recommendations didn’t work for me); the interoperability with spotify and the possibility to blacklist certain songs; the fact that the app gives a short description of what the broadcast is discussing when rewinding or as a desktop notification (so you know when you want to tune in), although it worked with too much delay for me. To improve: bugs, include more radio stations, unclear search screen in EN version. (M, 28, ENG)

Testers that participated in the previous pilot also stated the following: ‘I expected that the app would work more efficiently and faster than the previous one’ (F, 46, high radio profile, previous tester). It is clear that **users expect a prototype to work almost as easy and sufficient as a normal app would work**. A standard level of intuitiveness and an error free first introduction to the app are crucial. We learn that **especially the onboarding** should be carefully considered, from the interviews we noted that the first idea radio listeners have when opening an app is to listen to radio, the steps towards this should therefore be as easy and straightforward (e.g. an overview of the radio channels, pick a channel and listen to radio). Currently the first thing testers saw was a search page that did not work properly.

“At first the aim is to listen to radio and then access more search functionalities, now it was rather confusing” (F, 35, BE)

Aside from onboarding, users also experienced **issues with understanding the features**. We also see that when asking the question if **users would listen more to radio?** Users indicated yes, **if the app would work more intuitively**.
Comments were mainly structured around the understanding of features, technical issues and the general ease of using the application. The table below provides an overview of comments on ease of use:

- if it works more intuitive I would (F, 35, ENG) / usage too unintuitive (M, 43, GE)
- If the cited improvements were done (M, 28, ENG)
- If it were easier to use. (M, 43, ENG)
- Better metadata (M, 40, ENG)
Table 5: User comments platform-centric prototype
### Feature: Onboarding

The first steps of selecting and listening to a radio channel did not work for users. Especially the UI of the new advanced search caused issues for users. We therefore also see limited use of the app, or users that stop using the app after a first visit. This indicates that a clear onboarding manual and/or demo is needed for the app.

#### Quotes

- "The only channel I wanted to listen to was not working" (F, 33, BE)

- "I'm trying to search, the input field was hidden below the search button so I could not read what I was writing. The channel screen was all the time empty. If I after a search clicked on radio 1 there was never sound. Then I decided to quit (using the app) (F, 46, BE)

- "All very complicated. I didn’t manage to hear a stream :-( “(M, 45, GE)

The start screen (referring to the search screen) is very dark of color, I first thought it were the general settings, I don’t like a cold color to start with however it also has something private, others cannot watch when I’m using it in the tram (F, 28, BE)
<table>
<thead>
<tr>
<th>Technical issues</th>
<th>General crash</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The app wasn’t as stable as it should be for open piloting, users experienced multiple crashes.</td>
<td>&quot;Often crashes&quot; (F, 29, BE)</td>
<td></td>
</tr>
<tr>
<td>&quot;Crashes after startup. Unfortunately too unstable along with a DAB message from no internet and then the stream went you or logos would be downloaded. (M, 43, GE)&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘Partial waiting times in the app where you don’t know if it crashed or normal waiting time.’ (M, 43, GE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“The app is not working on my phone, I mean the only channel I have interest in (StuBru) is not working in the app” (F, 46, BE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding of certain features</td>
<td>Search, recommendations interface is too complex. Users are missing supportive information on timeshifting.</td>
<td>“Search interface is difficult, the buttons (e.g. substitution, back to live) do not speak for themselves. But timeshifting is intuitive and handy, and substitution is a very good functionality in itself.” (M, 40, BE)</td>
</tr>
</tbody>
</table>

For pure online radio with recommendations it is worse to use than Radio Player. The Serverbades Timeshift does not work as expected. The Spotify replacement brings a wow effect. (M, 43, GE) |

Search and recommendations not easy to use (M, 43, GE) |

Selecting a station was not as intuitive as navigating the radio program. Probably related to missing information on the genre of the station, and response times until it starts playing/displaying the available songs. (M, 52, ENG) |

in the app, it (referring to timeshifting) was not
**D5.3: Final report on pilot evaluation**

<table>
<thead>
<tr>
<th>General ease of use</th>
<th>It is clear that users expected a full functioning app, even in a trial setting. Better communication is needed to manage expectations of participants.</th>
<th>precise and not coordinated well with the info about the program (M, 28, ENG)</th>
</tr>
</thead>
</table>

"Ease of use, optimal way of working" (F, 29, BE)  
"That it would work more easy and more smooth than the previous version" (F, 46, BE)  
Something cluttered, overloaded UI (M, 38, GE)  
Still immature (M, 42, GE)  
A certain simplicity. It’s not intuitive at all. (M, 45, GE)  
I had to rely on instructions for certain things. For others, the idea was intuitive but it was not working properly (M, 28, ENG)

An important lesson here is that when the UI and UX are not optimal, users struggle with giving feedback on the concept and value of the application and the features.

**Perceived added value, willingness to pay and privacy concerns**

In the in-depth interviews, we could however frame the issues (see table 5) better with participants and delve more deeply into the concept of the application. We see that users really value the fact that hybrid radio offers a mix of experiences, on-demand versus the surprise effect of radio. Features that are most valued are 1) different channels available in the app, 2) topic-based search possibilities, 3) to see
what you are listening to, also when the app is closed and 4) link with Spotify to store and replace radio items.

We also see that users really see hybrid radio as a new way of listening to radio, something that needs your active attention. This latter is especially the case for users that are interested in topic search and on-demand content.

With a radio application like this I would keep my phone closer, and would listen more to radio when I’m at home, especially in the morning. Then I would like to listen more actively, and also to the news. In the evening I would prefer only music, so not active listening. (F, BE, 39)

However not all users share this same idea. Some users like the background effect of radio and the role of traditional broadcast radio. To have the mix of both is therefore needed.

“Was not clear to me (referring to Spotify and being able to skip songs). Still, I listen to the radio while doing other stuff in the house and could not bother to go to my phone each time. I like songs on the radio but hardly ever I want them (to hear) later.” (M, 37, GE)

The majority of users would prefer a freemium account at first, if they would after a certain amount of time be convinced of the added value of the application they would maybe consider to buy a premium account. The amount would then vary between 3–10 euros/month. “I would pay but not as much as with Spotify. I already have a premium Spotify account, I really did not like the ads in Spotify and that’s why I bought the premium version.” (M, 28, BE). Users think it’s hard to weigh Spotify against this app, if they already have a premium subscription for Spotify they are rather reluctant to buy an additional premium subscription. It is thus important to look at what extra value hybrid radio could offer in addition to these existing applications.

One of the extra values can be to expand the offer of radio channels. This was linked to respondents’ personal interests. For example, local channels to have more diversity; European channels to stay up to date or when traveling, worldwide for the surprise and discovery aspect.

“I’m really waiting for a radio application with a collection of different channels. For a public broadcaster this would mean more diversity” “People are so used to fetch whatever they like” (F, 35, BE)

“I really saw the improvements (compared to pilot 2) but I just did not listen because of the crashes, I would listen more to radio with an application like
this, but I would love to have different radio channels and not only Flemish channels. (F, BE, 39)

It is important to mention that Spotify, the federated search function (e.g. location) and the privacy declaration raised questions concerning control and privacy. One participant stated that she did not link her Spotify because there was not enough context on the why and how. Also the privacy statement was not clear: Yes I agree (looking at the privacy statement), but with what do you agree? (F, 28, BE). Here we learn that clarity and sufficient information in the application can enforce trust and control, not taking this into account can prevent users from trying out new features. However, it should also be noted that ‘too much explanation gives the feeling that it is ‘covering something up’ so there needs to be a good balance.’ (F, 28, BE).

Another important value that was also mentioned in pilot 2 is the option to chromecast. No Chromecast support makes life hard. (M, 37, ENG)

3.1.3. Evaluation per feature

As explained in the previous section not all features were as clear to the users. These numbers provide more insight on which functionalities were difficult to find and need extra context. The features that are used the most are timeshifting (576) and favourites (245). Song substitution (163), recommendations (87) and podcasts (28) required more actions; users had to agree to connect their Spotify in the settings and press the skip button (a function completely new to the user). Recommendations (87) and podcasts (28) are used least, these were only available in a separate screen and not many users discovered these. Users were also asked to evaluate the search function and what is it about (visualising information on songs etc).
In the next section, more elaborated insights on the features are discussed.

Timeshifting

Timeshifting, e.g. selecting a different point in time via slider or by using the rewind button, is extensively used by testers. Testers also frequently used the button to *jump back to live radio* (343 times), an important user requirement retrieved from pilot 2. The *pause button* (492) another important requirement retrieved from pilot 2, was also *extensively used*.

Timeshifting is an *important function for testers and should be included* in their future radio application (14 out of 20 agree, 1 disagrees).
UI e.g. the time slider, contributed to this evaluation. Most participants prefer to use the time slider instead of the buttons. Users expect to use timeshifting for all radio items (programs, news, music) and not only for music. Listeners want to be able to intuitively shift through time and pick the content they are looking for. Therefore 1) the difference between the radio items should be clearly visualised in the stream ‘now I see everywhere Eva de Roo’s face (one of the radio presenters of StuBru), but I don’t know what it represents’ (F, 35, BE) and “important items such as news should be highlighted” (F, 35, BE). 2) the time slider should be “precise and coordinated well with the info about the program” (M, 28, ENG).” One participant also suggested visualising new content such as podcasts in the timeline.
Favourites

**EVALUATION OF FAVORITES**

<table>
<thead>
<tr>
<th></th>
<th>Feature for the future</th>
<th>Fun to use</th>
<th>Easy to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>strongly agree</td>
<td></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>agree</td>
<td></td>
<td>7</td>
<td>8</td>
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<tr>
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<td>disagree</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>strongly disagree</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 15: Evaluation of favourites

To save or store selected songs, “the fact that you can immediately see that it is stored in a list, and that you can search for the artist later on.” (F, 35, BE) is valued by participants. Participants indicate that only “having favourites is too basic” (M, 28, BE), “really going back to all songs that have been played and that you can add them to a favourite list is a real added value.” (M, 28, BE). One participant mentioned she also want to favourite and save programs “I would like to store programs to watch at a later moment, to store them in a library and then give it a name” (F, 32, BE).

The majority of users (16 of 21) indicate the need for this feature in the future, especially the fun factor scores high. We therefore clearly see that users are more satisfied than in pilot 2. Whether users would pay for a premium account is not clear. “Don’t know if I would pay extra for this, I already have a premium account with Spotify and I just really did not like the ads and therefore opted for a premium subscription.” (M, 28, BE). Here it is important to consider the extra feedback from users.

“I especially missed information on how to use it (also referring to the app in general)” (F, 28, BE)
6 participants\textsuperscript{12} required improvements of the functionality, aside from UX improvement (e.g., the pressing on the icon did not always work). It is important to \textbf{provide sufficient information on the data flow and ownership of the data}. Also the \textbf{privacy settings} (opt in/opt out) in the menu should be clear to users (especially, if 3rd parties would have access to this information).

“I have absolutely no problem with using Spotify if someone would have said to me ‘no worries, no one else has access or sees the songs you like’. I only have a problem from the moment others can see this. Do the radio stations afterwards know what I’m listening to?’ (F, 28, BE)

“I also don’t have a problem with broadcasters having my data for pure user insights, if I myself see the benefit, ok, most important is knowing what this all means and if they can assure that it’s anonymised. But that’s why I first need to know this” (F, 28, BE)

The feature therefore \textbf{requires optimisation in access} to the list of favourites and \textbf{adding information} on 1) the possibilities of favoriting an item and where it is stored 2) who has access to this information and what it means when you link your Spotify account.

It should also be considered that \textbf{not everyone prefers Spotify or has Spotify}. A participant questioned if Spotify was needed for this and preferred “\textit{local storage of music without Spotify}” (GE, M, 61). As mentioned before this is also an active feature, people need to engage with the app to use it. Not everyone indicate it as highly needed, because of preferring to listen to the radio in the background, as illustrated by:

“Was not clear to me (referring to the favourite function). Still, I listen to the radio while doing other stuff in the house and could not bother to go to my phone each time. I like songs on the radio but hardly ever I want them later.” (F, 46, BE)

\textsuperscript{12} 10 participants indicated the feature does not require improvements
Aside from storing favourites, **users like the skipping and replacing content from live radio.** Skipping content is even rated as more fun and needed in the future radio application. Different motivations, linked to how they appropriate radio in daily life, can explain this. Some users for instance like this feature because it avoids the repetitiveness of traditional radio. “The option to link Spotify is super nice because I do not like traditional radio. Would be interesting to improve the algorithm of Spotify. There are always certain artists which you don’t like and you would prefer to skip.” The blacklist was also highly appreciated by this participant. However, he would prefer to have the option to add a replacing item to the blacklist or not, according to him not all skipped items are needed on the blacklist: “the choice between just skipping and skipping+blacklisting should be given” (M, 28, ENG).

Others are more moderate, replacing content is nice but the connection with live radio should remain close. The fact that Spotify is being used while staying connected to radio (and staying in the radio app) is positive, users do not expect to leave the app. This was also a comment last time that **users would like to be automatically drawn back to live radio** otherwise they fear to miss out or would not see the point.

> I would rather prefer to see it as a radio app, would not want to leave the app to go to Spotify, would be better to get different choices within the app. (F, 32, BE)
“Smart you are not leaving the app. Positive as well that it is not trying to replace Spotify there is a good mix of both worlds (issue with radio is you depend on what they give you, but the complete opposite with Spotify is you don’t have the background, this mix I like, for instance listening to the news 3 times is quite annoying)” (M, 28, eng)

Maybe also secure broadcast instead of just using Spotify (M, 43, GE)

Others doubt that it would fit with their daily patterns:

Nice to have the combination, to let you get surprised by radio and if it is folk, I can easily shift to another song. But I’m wondering if I will really make use of it. Sometimes I listen to radio with the idea to not have to choose for yourself. At work, it’s more background music. However, If I’m on the road, I listen more actively...

It’s fine, but I listen mostly to talk shows or hitlists and the first, I don’t mind their selection to distract me and for the second, would be rather nonsensical. (M, 37, ENG)

Same as with the favourite function, introducing a third party to a radio application may cause listeners to be more aware of their privacy, and in some cases limits users to try out a new functionality:

“To replace content with your Spotify account, super interesting but I did not link it because there was no explanation or sufficient context in the app” F, 28, BE

The substitution function can still improve on UI, the buttons are still not always clear to everyone, as was also mentioned in pilot 2. “Need to make it graphically more visible” (M, 40, BE)
Compared to the other features, **recommendations were not clear and difficult to find for many users** (users had to go to a separate screen). This we also see in the evaluation of the feature, some participants (strongly) disagree with the ease and fun of use, and indicate no need for the future. Nevertheless, the interviews tell us that for some listeners **recommendations can be a turnover to use a hybrid radio app in daily life, but improvement is needed.** 1) the recommender system needs a **good working algorithm,** 2) **higher quantity** of recommendations and 3) **location settings** need to be more advanced. The latter was mentioned a couple of times, it seems as if users did not find the location settings or did not understand how to use it. Different location layers are expected e.g. local, European and global channels.

Only a very few stations, it would be nice to provide recommendations from other countries. Nowadays it is not easy to find radio stations just as easy to find music with Spotify, this could be improved. I don’t like the algorithm of Spotify now. (M, 28, ENG)

I expected more of the radio stations, I would like to be surprised and be introduced to channels I didn’t know they exist, more in a global context (F, 35, BE)

If you listen to VRT-channels, you don’t want recommendations from abroad. It’s not because they play similar music (referring to recommended channels) that they are replacements (M, 40, BE)
Control remains important. Recommendations play a secondary role to users’ personal preferences. This should also be considered in the lay-out as is stated by this female respondent:

“It’s nice to discover new music but it should only appear for a moment, should not all the time be there” (F, 35, BE) Another participant stated “First screen should already include some channels: the biggest ones and then along the way new ones can be added based on recommendations or by using search functionalities. Also important with recommendations is to have the choice to add them or not “and after that they can leave me alone” (F, 32, BE)

Some participants don’t want recommendations, an opt in/opt out should therefore be included.

“I don’t need recommendations. I have 10 podcasts listed which I cannot follow because too much content and too little time, let alone some more recommendations. I know quite well what I need. I go to live radio shows I like and follow some podcasts, and have little time for anything else. I like to be my own filter. (M, 37, ENG)

Search

![EVALUATION OF THE SEARCH FUNCTION](image)

Figure 18: Evaluation of search function

The search function is the least ranked on ease of use, at the same time, second most needed feature in their future radio application (18 participants). It is therefore very important that changes are made to upgrade the UI (color, language, layout of the answer categories) and UX (e.g. too exhaustive: as first
introduction, the ranking order and list of categories). 13 indicated the need for improving the feature.

‘First thing you want to do (if you download a radio app) is see radio stations, listen to radio and to then have access to other search functionalities (such as …) now you have name as first word, can be a bit confusing (F, 32, BE)

‘Name’ is this ‘artist’? First thing I thought was filling in my own name. The screen is also way too dark, it reminds me of personal settings rather than a search screen.” (F, 28, BE)

There is also a lot of difficult language that I don’t understand: ‘filter tuners’, ‘shoutcast versus EDI’, ‘federated search’ this makes me think that I best just stick with the standard settings, it’s kind of scary, i’m afraid of doing something wrong. (F, 28, BE)

‘It really looks like developers made it (M, 28, ENG).

For many users the functionality did not work:

Was not useful because of either limited number of stations or using search terms not known by the app (M, 52, ENG)

It did not find any of my searches besides one station by name. a proxy search was not possible (F, 35, ENG)

Simple Google Style series for searching only in advanced search. DAB search as part of the search makes it very slow. Either DAB search separately or add Sport for Dual Tuner for automatic background scan. (M, 43, GE)

However, we also see very positive feedback on the concept; the degree of personalisation and advanced search possibilities. It is therefore important to perform more research on how this federated search functionality should look like.

Location is really nice, I really like the idea that you can adjust it yourself, let’s say you are in Spain and that you receive channels from there or here to practice my Dutch, Dutch channels (M, 28, ENG)

Topic based search is the most interesting, I would like to actively search in programs, I’m usually actively listening to radio if I’m on the way. At work it’s more background music. (F, 32, BE)

To listen via genre is really important for me (F, 39, BE)
Podcasts are highly valued as fun in a hybrid radio application. However, this functionality was either difficult to find or ‘there is room for usability and scope improvements. You need all standard podcast functionalities.’ (M, 37, ENG) Also other participants indicated the need to add functionalities such as to filter, jump directly to the beginning of the podcast and to offer the next podcast whenever another one finished playing.

Podcast filter collection and player should also be possible. Jump directly to the beginning of an episode from the podcast while listening to the radio in the car. (M, 43, GE)

Podcast selection of the current broadcast. Subscribing to podcasts would be good. And offer to play the next podcast after program start (M, 43, GE)

The relevance of the podcast offer was not great yet (M, 40 BE). One participant indicated a wish to integrate a personal podcast: (need for) integrating own podcasts (M, 52, GE)

Not all participants are interested in podcasts so this should not conflict with the regular live radio interface: I don’t have time or the need to listen to podcasts. (F, 46, BE). “I tune into radio to listen an interview that is happening on that moment instead of waiting one day for a podcast” (M, 28, ENG)
What is it about

**Figure 20: Evaluation of ‘what is it about’**

I listen to radio to discover new music, to see what is playing is a huge added value.

Participants ranked the **what is it about feature** as **most needed** in their future radio application. The feature was also evaluated as **clear and understandable**. Additional suggestions are to **add more information** for music (cover, artist, ...), and to **clearly structure** the different radio items, a comment that was already mentioned in the timeshifting section. Some users only saw the same repetitive picture (of a radio presenter) for different radio items (news, program, music).

- *Only gave useful information for music.* (M, 1980, BE)
- *Arrangement and contents are not to be understood directly.* (M, 43, GE)
- *Cover or artist art would be fine...* (M, 45, GE)

**Cross-device functionality**

23 participants evaluated the cross-device functionality, this feature allows users to continue listening to radio on different devices regardless of location.

The majority of the participants (17 of 21) were met in their expectations of the cross-device functionality. In Belgium, we had more difficulties with activating the cross-device feature, therefore we see a less positive evaluation on ease of use in Belgium. But in general, the cross-device feature is **positively evaluated** by users and especially highly ranked as fun to use.
Different unique aspects of the feature were mentioned:

- The radio experience is enhanced in-depth and users value not missing out on content and in any moment.

  "more active, conscious and useful radio usage" (P11, M, 53, GE)

  "being able to continue listening the programme I listen to a breakfast in the car when driving to work" (P10, M, 53, GE)

  "the fact that it really continues of where I left radio" (P22, M, 28, BE)

  "Pause and play the radio broadcast (you do not miss out on anything)" (P23, F, 28, BE)

- Participants also focused on the ease of using and listening to radio with this functionality.

  "combination of simple usage and cross-device functionality" (P14, F, 36, GE)

  "convenient service following" (P12, M, 61, GE)

  "easy switching between devices" (P2, F, 36, GE)

  "to have an interrupted radio experience across different devices" (P5, F, 46, GE)

  "simple and easy to understand. Known from Spotify etc" (P1, M, 41, GE)
Although the feature was evaluated positively, not everyone was as convinced to have this feature in their future radio application, only 2 of 20 would pay for this feature with a monthly budget ranging from 5-10 euro. The majority would opt for the freemium version. Participants suggested improvements in first of all the synchronization, this was for some too complex “allow to automatically retrieve sync state instead of button press” (P13, M, 32, GE), there was also a comment on the duration of the timeshift “perhaps a buffer that offers more than 2 hours (P14, F, 36, GE)” and others suggested to improve the UI and have this synchronized for all the different devices.

For one participant the added value could be ‘if the app is also available on smartTV’ (P21, F, 38, BE).

Important to know is that this feature is especially useful/valuable for users that are active listeners, make use of the timeshifting function and are used to listen to radio on different devices. Furthermore, users especially see this as a feature for in the car. Several comments demonstrate that:

“If I would use smartphones/PCs for radio consumption, I would appreciate this function” (P11, M, 53, GE)

“I do not have a reception possibility in my car” (P12, M, 61, GE)

“I mostly use radio as background entertainment” (P2, F, 36, GE)

3.1.4. General conclusions

The concept of the platform-centric app is evaluated as positive by users. Users especially value the mix of live radio with on-demand content. The ideal mix depends on the type of listening mode13. Similar to pilot 2 we learn that there are active versus background listeners. Active users extensively use timeshifting and song substitution compared to background listeners. Background listeners also use HRADIO features such as the advanced search functionality and recommendations but with different expectations than active listeners, especially in terms of UX, which is important to consider.

[13] In annex more information on the definition of the pilot 2 defined different listening modes.
In total, 520 users downloaded the platform app and 284 used the app actively. As explained, less users provided feedback via survey, partly also by how the test was set up and the readiness level of the prototype.

We learn that when first opening the app people expect to get an introduction and a start screen with radio channels and only after that access settings or advanced search. Second, when testing novel features such as substitution and advanced search requires more time, support and guidance e.g. a user manual at the beginning or a ‘remember’ notification in the app could counter this.

Users really liked the improvements and new UI/UX implementations based on user feedback from pilot 2, especially in timeshifting, song substitution and favourites. There is however still work needed on search, recommendations and podcasts.

- Search functionality was ranked least in ease of use and second most important to have in a hybrid radio application. More research on visualisation and structure is required

- Recommendations were used least but can become a real turnover why users would use a hybrid radio application. Therefore, it is important that 1) the algorithms operate sufficiently, transparent and adapted to users interest 2) the channel offer is expanded on location, this pilot showed that there is high added value is in variety of location levels (local, EU, global, 2)

Important are the user feedback on working with a third party such as Spotify. To favor, skip & store content is highly valued but linking a third party demands more transparency on the definition, the operationality and the results of the involved features (data flow, what is shared with whom). It should also be considered that not everyone uses Spotify or that the use of a third party also depends on the type of listening mode as it requires already different steps.

Finally, the cross-device functionality was evaluated positively, for active listeners it enhances in-depth listening of radio content and creates a feeling of constantly being up to date. This feature is especially useful in an automotive setting.

### 3.2. BRAND–CENTRIC PROTOTYPE

The brand-centric prototype focuses on bringing a station (or brand) specific experience to the user. “Radio 1” is a VRT radio channel that guides its audience through the news and inspires people with new discoveries, insights and experiences. The app combines live radio and timeshift experiences with an on
demand catch-up service (‘Daylist’). Besides timeshifting other HRADIO functionalities are favourites and recommendations.

3.2.1. Participants

The prototype was downloaded by 152 unique users in Flanders. 132 replied to the registration survey. Participants are predominantly male (100 out of 132). Only 30 participants identify as female, 2 as other. This is not surprisingly different from the standard listening population of VRT radio and particularly Radio 1. Furthermore, the Pilootzone test panel, that was used to spread the call, also counts more male subscriptions\textsuperscript{14}. Participants taking part in the test are also slightly older participants. Only 12 of 131 participants are students, the timing of the testing (e.g. Christmas exam period) potentially played a role in this. Aside from age and gender, the panel of testers is diverse in other socio-demographics such as profession, education and geographical area.

The number of active users (i.e. users who performed more than 1 activity in the app) is 42. This number is rather low compared to the number of downloads, however, such drop-out rate is also seen in other studies (e.g. Habibipour et al., 2017).

The majority (32) of the active users (42) could personalize the Daylist manually with filters on interest and time. 10 of the 42 active users were defined as the ‘lean-back group’, and received the personalised list automatically, based on user behavior\textsuperscript{15}. Furthermore, there was a difference between operators, the 24 participants with an Android device could access live radio, the other 18 participants with iOS did not have access to live radio. Despite these differences in numbers, we do not see apparent differences in usage or prototype evaluation by the two groups.

31 Participants filled in the final evaluation survey. 13 Participants filled in open feedback in the surveys. In addition, of the 152 that installed the app, 10 participants (6 Male, 4 Female, Avg. 47 years old, see also table 2.) were invited for a semi structured interview. Of those 10 users, 4 had not opened the application before being contacted for the interview. Here, we were also interested in the reasons why they did not use the app earlier. The table shows more information on the profile of

\textsuperscript{14}A similar project on news personalisation also showed this gender difference (e.g. 1051 men against 294 female)

\textsuperscript{15}This number is unequal since it represents only the active users (i.e. users who performed more than 1 activity in the app).

If you look at the total panel of testers the division between lean-back and lean-forward is equal.
the respondents. Almost all participants listen daily to the radio, except two respondents who listen less frequently.

Table 6: P1-P13: participants who gave open feedback in surveys. The ‘Ctrl’ group is the lean-forward experience, the ‘Test’ group stands for the participants that had a lean-back experience. P14-P23: participants interviews

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age</th>
<th>Group</th>
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<tr>
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<td>Test</td>
<td>Android</td>
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<td>27</td>
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<td>Android</td>
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<td>P23</td>
<td>F</td>
<td>57</td>
<td>Test</td>
<td>iOS</td>
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</table>

We see that testers mainly download the app because they are interested in radio and the future of radio. A few participants were already acquainted with the HRADIO project (6/31). People that participated in the interviews were either early adopters or strong “fans” of Radio 1.

3.2.2. Discussion of generic prototype

User satisfaction, perceived usefulness and ease of use

Overall, the brand-centric prototype with daylist (= personalised list of radio items) is evaluated positively on the level of satisfaction, especially the fun factor and the look and feel is rated high. Participants described Daylist as ‘an information catch up’. A 39-year-old male participant mentioned he used the app to catch up with the most important things that happened during the day. “It was mainly the intention
[for me] to make up for the missed fragments of the previous day.” A female participant with a chronic illness indicated the app was of great value to her, “I think this is a nice way to listen to the radio (because as a radio enthusiast, I got a lot of trouble listening to the radio due to chronic illness. That’s why I miss a lot but don’t know what.) Now I can indicate what I would like to hear, a choice is presented for me and I can start listening at a time I want.” (P14, F, 54).

It should also be noted that the results from the weekly and final survey show us that the **satisfaction rate is influenced by the ease of using** the current features (e.g. technical inconsistencies\(^{16}\)). Not all features were as clear for all users, as illustrated in the quotes below.

*The first time I opened the app, I did not really understand it (the app). You could choose a fragment but I did not understand what I had to do next. You have to click somewhere to open the arrow below but that was not as clear. I also did not find it that easy to open the player itself.* (P20, M, 28)

*That is not always clear for me, when is it live and when is it a fragment? Maybe it should be better visualised. It is also not clear to me how you can stop live to go to a fragment. It could be – in my opinion – easier to use* (P21, F, 65)

We also see in logging data that testers used the app as ‘testers’ and not consistent over the tested period, e.g. listeners intensively use the app in the beginning with a general decline of testers after a number of actions taken.

On the level of **usefulness** – meaning how useful the app is in daily life – we see that this varies according to participants expectations and current listening habits. Personalisation is key here and there needs to be a significant difference with current used applications\(^{17}\). Participants expect to have enough content available to fill their radio days and want to be able to select this content according to their preferences. In this line, listeners expect that current content and search features

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16 technical issues were the following: the go back button did not work, radio automatically starts to play when starting the application, radio stops playing when phone is in sleep mode. This was expected since it was still a prototype version of the app, therefore it was opted to test in a semi-open pilot setting and not an open pilot.

17 Radio 1 Select
are more elaborated e.g. possibility to download programs, search for a program/presenter, location....

However, we also see that this degree of personalisation comes with concerns regarding the transparency of the recommender system:

‘Can the developer see what I’m listening to? Is it like with Google, that if you visit a pair of shoes you will only receive advertisements based on that?’ “I prefer to indicate my interests myself, it depends on what I want to listen to at that moment. I would have liked to be in control over my interest settings, I just clicked things randomly and did not think it through (referring to the test). If not, you can miss important conversations.” (P16, M, 53)

‘It would not be bad mentioning personalisation is being used in this app and that you as a user can turn this on and off. If it is ‘on’ then you know ‘ah, it will be ok and the content will get better (referring to the recommended items in the playlist)” (P20, M, 28)

**Perceived added value, behavioural intention to use and privacy concerns**

Users highly value the possibility of accessing small fragments. ‘The fact that you now do not need to scroll and search in an interview. I kind of like it that this is automatically done for you’ (P17, F, 20) Interestingly, some participants stated that the daylist exceeds the importance of live radio18, “I prefer to listen at a time when it works for me. It is the same for tv, I never watch it live. It is probably typical for my generation to experience things on demand.” (P18, M, 20).

In order for participants to **listen to radio more, privacy and control concerns should be taken into account**. Most importantly, hybrid radio should be equipped with sufficiently transparent tools to adjust the settings to their preferences. The results learn us that both lean-forward (P16) as the lean-back group show concern (P20). Second and also linked to the previous insight, there is **not one size that fits all**, there are listeners who mainly focus on daylist, expect only informative content and less live radio, and there are listeners that expect daylist mixed with live radio

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18 For them there was no need to have live radio available in this app “there are other applications that I can use for that”.

---
fragments (e.g. music) to keep it ‘light’19. Listeners that see radio as a source of information highly value the concept of this application. Listeners with (additional) entertainment motives miss the switch to music from time to time. This is an interesting learning to consider as in what kind of public you want to reach with the app and how you mix personalisation options with live radio. Third, since this application is already a dedicated branded app, participants feel they are already spending all available time listening to their favourite radio station. Personalisation could therefore maybe not increase radio listening in quantity but it could improve listeners’ qualitative engagement with the radio shows. Fourth, listeners that did indicate to listen more, mentioned the need to have multiple radio stations in one app and to search content across channels. Participants also mentioned using the application in their car or when they are biking. Therefore, they would like to be able to download content.

3.2.3. Discussion of features

Users listened most to daylist (= recommended fragments in a day planning) 414 times, 132 paused and 563 played fragments. Live radio was less played (328 times by 28 users), as mentioned earlier this can be explained by the fact that only Android users could access this functionality. However, this did not influence the general satisfaction of the prototype as we do not notice any recurrent difference in the evaluation by the two groups.

19 Here it should be noted that the combination of daylist with live music was for some confusing, it seems that most of the participant started from daylist when listening to radio and saw live music only as an additional feature to the app.
The other features are used in following order: 1) recommendations, 2) favourites, 3) search and 4) timeshifting, however these were remarkably less used than daylist and live radio. Aside from the argument of difference in operating system, the interviews taught us that these features are too novel, and ease of use and clarity of the functionality influenced the actual use and discovery of these features. Third, the user data tells us that users mainly tested the application for daylist, in logging data we see that users stop using other HRADIO features after the first opening.

*The main goal (for me) was to keep up with missed fragments from that day.*

(P2, F, 58)

The graphs below demonstrate this:
Figure 23: Overview usage radio fragments

Figure 24: Overview usage favorite items
In the next section, a more elaborated overview per feature is listed.

**Daylist**

Users **highly valued** the personal playlist and mentioned it as a ‘catch-up’ of what **they have missed** during the day. The Daylist feature can give users the opportunity to listen to radio content when it works for them, not when it is aired.

“I prefer to listen at a time when it works for me. It is the same for tv, I never watch it live. It is probably typical for my generation to experience things on demand.” (P18, M, 20).

**For some** listeners **daylist** therefore **exceeds the importance of live radio:**

“That is not really useful to me. In that case, I will listen to the radio.” (P14, F, 54)

“I have other apps for listening to live radio.” (P21, F, 65)

In the interviews, 6 listeners mentioned they would **prefer the mix of both worlds** and that the latest news bulletins, weather and traffic updates are added to daylist. Previous research has shown that certain types of radio items that are characteristic for traditional radio are lost when listening non linear (Hirschmeier et al, 2019). **Hybrid radio can be a solution of the on demand service, with a closer connection with live radio.**

Other learnings for daylist are the **importance of an onboarding functionality to indicate interests.** Users would like to personalise this via their personal user data (e.g. location) and also expect to have more options then only choosing topic e.g. the option to mark radio hosts and programs as their favourites to influence the personalised playlist.

“It would be an added value for me to say what I am interested in.” (P15, M, 67)

I would like to get a playlist based on my interests. I will combine different sources to stay up to date on topics I’m interested in. (technology, the stock

---

20 Other live events like lottery drawing for concert tickets, on-air requests to hear a song or longer live broadcasts of events were not mentioned as missed things.
market...) Those subjects are so specific that I’m not able to find this in what linear radio offers me. (P12, M, 58)

**However, the fear for the filter bubble should be considered.**

“I would regret that my choice on one specific day would determine that I would never hear anything about one particular theme again.” (P13, M, 39)

**Recommendations**

The related items are a list of items that are related to the current item that is playing. This could be an on-demand item, but also the live radio.

The **recommendations feature is used most**, 12 users clicked on a recommended radio item or fragment 106 times in total. Which means that listeners that made use of the related items list, used it extensively. This was also the most visible feature as recommended items appeared when listening to radio or Daylist.

![Figure 26: Related items](image)

From the interviews we learn that **listeners like the surprise effect**. “Let the app surprise me” (P19, M, 51). However, users address the **importance of having this content separated from the Daylist to avoid confusion**. Users sometimes tend to search for one program specifically and lack time for additional content, however sometimes users do want to have the so-called surprise effect, therefore a separate list would solve this problem.

‘There is no time to listen to a (recommended) item. If it already takes 5 minutes... I would maybe listen to something during my break’ (P16, M, 53)
“If I could make a playlist out of recommended items, I could maybe listen to it at a later stage” (P21, F, 65)

One suggestion is to work with a notification system whenever a new fragment for a certain theme is available.

“It could be maybe interesting to put on an alarm for that (referring to recommended items). That you would be warned from the moment there is a new fragment available on a certain theme” (P17, F, 20)

The favourites function

The “favourites” function allows participants to listen to radio items that they designated as their favourites. Participants do this by clicking on a heart icon next to the play button as shown below.

The favourites function is the second most used feature. 19 of 24 Android users did use the favourite function on average between 0 and 5 times. Users especially feel the need to store radio items somewhere and therefore interpret the favourite function as such (see further).

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<tr>
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<td>5 min</td>
<td>DE OCHTEND</td>
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<tr>
<td>WARD VERRICKEN OVER LITTLE WOMEN</td>
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<td>“CREYTIS MOET WERK MAKEN VAN SNELLERE PROCEDURE VOOR TOPTALENT”</td>
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<td>“CREYTIS MOET WERK MAKEN VAN SNELLERE PROCEDURE VOOR TOPTALENT”</td>
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<td>DE OCHTEND</td>
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Figure 27: Favourites

Participants evaluate this feature differently depending on the content; music or informative shows. If used for music, participants compare it with the functionality of Shazam and like the idea to relisten music via the app. If used for news or radio
programs, participants favoritise items to ensure that news items would not disappear (Daylist only covers the past 48h). Users also mentioned the importance to share items with social contacts:

“there is a need to save radio items, so they will not disappear from my list”. (P20, M, 28)

“I only used this function to keep items longer”. (P23, F, 57)

“Yes I might use it, for example, if I wanted to let one of my children hear it.” (P14, M, 54)

“I find that interesting, suppose I say, “I want to let my partner hear that once,” I could put that in there.” (P16, M, 53)

Aside from storing content, one participant expected that favourites are used as input for the recommendation system “If the system knows which fragments belong to favourites, then it can adjust the rest (of the list).” (P16, M, 53)

Other suggestions are to make a classification in the favourites list to see what has already been listened to, or to follow radio programs and therefore be up to date with new episodes.

“Maybe there should be a distinction: already listened to and still needs to be listened to. Or you can do this yourself; the items you really find interesting, remain, to relisten to at a later point. Others you can remove after you relistened them. You can also save items because you want others to hear it afterwards.” (P22, M, 55)

Not all users would make use of this functionality “If I really want to listen to something I will do that at that exact moment”. The ease of using this functionality also played a role why users did not feel the need to use it; one participant indicated it would be nice if it would be ‘extended to the full playlist functionality (and that there is a ) need to be signalized better, change the chronological order, .... – cfr. what can be found in the podcast players)” (P12, M, 58)

The search function

Subject search together with timeshifting are used least (7 users). With the search function you can search radio items by keyword. Here it is important to state that most of the users did not notify this feature. With the search functionality, some felt
less need to search for content in the daylist that is already personalised, for others stated it was not working properly and expected a more advanced search.

“did not notify it (referring to search functionality), does not seem something I would often use. I usually do not search for something in this kind of content, I only select from the offer. (P16, M, 53)

Figure 28: search function

First and foremost, the survey taught us there are participants that were not able to find the functionality. Suggestions are therefore to make the search function (1) “more visible”. In addition, participants suggested (2) to add more structure “search per category, per program, per date, location…”. And to (3) “make sure that when inserting keywords better and more refined results show up”.

Similar results surfaced during the interviews, where we learned that topics are considered too broad. Participants would rather search for programs or presenters:

“More possibilities [needed] for targeted search. For example I would like to search by date or program.” (P14, F, 54)

Nevertheless, participants still prefer a simple and clear overview.

“I would like to search per region. That I would be able to indicate interest in news from Ieper or West-Vlaanderen, that would be more easy. (...) like with the Radio2 app. But maybe it is then too much, the simpler, the better. If it would be the only app to consult news with I would say yes, definitely! (P16, M, 53)
“To me, it would be fine to give broad categories. You should not make it too tight, too many search options, then I would not know it anymore after a while. I prefer a generic overview.’ (P22, M, 55)

Timeshifting

Timeshifting is the feature that allows the user to skip to a certain point in the live radio stream.

As mentioned in the feature Table 3, VRT was only able to have DL+ for song items, not for items like top of the hour, news or traffic. The songs provided eventually enough skipping points in the stream to validate the concept, although the concept was perceived by some users as a playlist of songs instead of a time shift feature.

Only users with an Android phone could access the timeshifting functionality. From the ones that could use the functionality, one third used the timeshifting function. On average users timeshifted 4 times.

It should be noted that because of daylist, some users indicated less need for live radio (that includes timeshifting). Daylist users already have a list of fragments and
programmes available to which they listen at a defined hour in the day. The following motives are defined for re-listening. 1) to better understand content they did not get ‘live’, 2) to experience the content they already understood ‘live’ more in-depth, 3) to share with others.

Considering user motives, and as stated before, users see (more) value in timeshifting fragments (than music).

‘Would it not be useful to also show previous fragments? That would be nice. It’s more relevant for items, for music you can also use Shazam.’ (P22, M, 55)

‘That is not really something I would use, then I would rather prefer Spotify or Shazam. For me, this app is about information, not music’ (P20, M, 28)

Users therefore expect the timeshifting to be extended to programmes and would include a rewind button “so that you can jump 2 minutes back in time. Of course you can now use the pause button for this” (P17, F, 20)

One user indicated that he would prefer to read about news items than to listen via rewinding or timeshifting (P16, M, 53).

3.2.4. Conclusions brand-centric prototype

The brand-centric prototype was evaluated positively by its users, they see the use of the app and the daylist feature as something they would intensively use to select and listen to their favourite programs (in-depth). Users like the short fragments because it allows them to search even more for dedicated topics of interest. However the concept should be considered carefully especially on how to combine daylist with other hybrid features that are used with live radio e.g. recommendations, timeshifting and favourites. There was sometimes confusion between live and on-demand which led to remarks that e.g. live radio could be deleted. This should be carefully considered with regard to the concept of this prototype, as well as other important learnings:

1) as already mentioned in pilot 2 most of the participants already use similar radio applications and therefore strongly compare the output, with high expectations in terms of personalisation (advanced search, additional content e.g; news and weather). For example: “I expected that I could select programs. You can do that in Radioplus, and I think that is really an added value. But in Radioplus I don’t like the fact that I can’t see what the program is about.” (P18, M, 20) Participants want more granularity in the filter options: interests but also programs, presenters as well in adjusting their personal radio list. Context and “mood” are new parameters.
2) **transparency is key**, developers should adopt a ‘privacy by design’ strategy in order to make sure all ‘hidden’ recommender and personalisation features are clear to the user. By doing the experiment with the lean-back and the lean-forward group, we noticed that people do expect control and insight. ‘If you add such things (referring to recommendations) this makes the app more fun. However, what if you listen a lot to politics do you receive a high score for politics? Will you then also access other news? That is of course the disadvantage of such technology, what if you have a broad field of interest?’

3) Although this application is brand-centric, multiple users mentioned the need to have multiple VRT channels in one app. Users would like to search across channels for topics of interest.

4) Even though it is a test, when testing new features, the ease of use is important since it contributes to the overall understanding of what an application has to offer. “There was almost no explanation in the beginning. You were thrown in (referring to the app) You can only press a question mark here” (P20, M, 28). An onboarding functionality is needed, e.g. a guide within the app.

5) It should also be considered that new features require extra effort in visibility and transferring added value to participants. Users therefore need more time to explore new features, and get used to a new application.

### 3.3. BROADCASTER-CENTRIC PROTOTYPE

The broadcaster-centric prototype had two channels available, the normal radioeins stream and the radioeins stream with HRADIO features (as explained in section 2, description of prototypes, this was extended to multiple broadcaster channels after the test). The included HRADIO features are additional programme information, timeshifting to 3 different positions, content substitution via Spotify, additional content and bookmarking to listen to the content on demand.

#### 3.3.1. Participants

50 testers downloaded the prototype, of which a total of 34 testers (17 women and 17 men) took part in the user test and responded to the survey. The testers were asked to test the functions in the pilot application for at least one hour, the prototype was available to test for 10 days.

The age category is highest between 25–55 years old, which also corresponds to the main target group of **radioeins**, the RBB radio station who provided the content.
D5.3: Final report on pilot evaluation

Demographics

**GENDER**

- Female (F): 50%
- Male (M): 50%

Figure 32: Participants’ Gender (Germany, N=34)

**AGE**

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Participants</th>
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<tr>
<td>18-25</td>
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<tr>
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<tr>
<td>55-65</td>
<td>2</td>
</tr>
<tr>
<td>65+</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 33: Participants’ Age (Germany, N=34)
Radio profile

The majority of respondents often listen to the radio in their everyday life, mostly at home or while driving a car.

The workshop was also attended by people who are very interested in technical and radio-related topics and testers have a high level of education. This panel therefore includes more friendly users than generic end-users, and is therefore slightly different from the user panel of the other two prototypes. All persons who were interested in the user test were invited, and there was no special selection of testers. 11 of the 34 testers participated after testing the mobile application at home. 6 of the 11 testers from the workshop had also participated in the previous test round 2. They emphasised how interested they were in a modern radio application and were pleased to hear of the progress of the project.

We also learn that currently listeners are most interested in variety and recommendations if it comes to music, to listen to specific content e.g. radio shows and to have the latest information on news and interviews. Users currently want to keep the amount of advertising as low as possible.

3.3.2. Generic app level

User satisfaction, perceived usefulness and ease of use.

On the satisfaction level, users find the prototype fun to use and would recommend it to friends, family and colleagues (see graph below). The app overall meets the needs of users and scores high on usefulness (see graph in annex).
The new HRADIO functions in the "radioeins Pilot" were clearly preferred over an application without HRADIO functions like streaming services integration or song bookmarking. 10 out of 11 testers in the workshop stated that they would use such HRADIO functions like timeshifting in a playlist, additional program information and the integration of a streaming service provider like Spotify.

"I have tried both app versions. In the normal app [note: radioeins live program] there was a playlist with music only, but non-spoken audios - for someone who listens to the radio just because of the music, this might be good, but I'd rather have the reports (e.g. concert recommendations) like in the pilot" (P10, F, 32)

"I would rather use an app that would allow me to use the new features, but if I had the ability to access multiple radio stations from one app, I would expect them all to have the new features - that would be great" (P5, M, 58)

The testers mostly had a trouble-free test process. The installation of the application via Google-Playstore test account did not cause any difficulties for testers. Based on comments from pilot 2, the app started with introduction/onboarding slides (see annex), that guided the users through the main features of the application. We therefore see a high score on ease of learning how to use the application.
In pilot 2, the usability influenced the user feedback. For instance, an important finding from pilot 2 was that the testers did not always know whether they were listening to live or on-demand content. This was improved in the new version of the application by a reduced display style and by adding colour highlights, which users clearly noticed:

“I find the app clear and structured and you always know where you are. I especially like the simple design of the app” (P9, M 32)

“The app is very user-friendly” (P8, F, 54)

“I am impressed by the clear structure of the app and the clarity and intuitive navigation” (P9, M 32)

All testers, who had previously participated in the earlier HRADIO user study, rated the new clear and concise structure and user interface of the app as very positive.

“The app is better than the last time, the playlist is very practical, because you can make targeted selections, very clearly marked and of great benefit” (P4, M, 48)
Nevertheless, we also see that the majority of users noticed some technical inconsistencies\textsuperscript{21} with the app. Since the app is still a prototype, the testers were aware that app crashes could occur. During the in-depth discussions it was clear that the positive feedback outweighed the technical problems.

**Perceived added value, behavioral intention to use and privacy concerns.**

Most of the testers would listen more to radio because of the elaborate choice they currently have. Users specifically mentioned the importance to have content according to their interests. As mentioned earlier, latest news, weather and traffic updates are also highly valued.

“I already listen to a lot of radio, but I would listen to even more radio with a new app, because for me the elements are important. I am a conscious radio listener and attach importance to topics; especially the latest sports news, which you can listen to afterwards.” (P7, M, 29)

<table>
<thead>
<tr>
<th>WOULD YOU LISTEN TO RADIO MORE FREQUENTLY IF YOU COULD USE THE APP IN YOUR DAILY LIFE?</th>
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<tbody>
<tr>
<td>YES</td>
</tr>
<tr>
<td>YES, IF...</td>
</tr>
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<td>NO, BECAUSE...</td>
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</table>

\textsuperscript{21} The horizontal axis allowed up a listener to rewind by up to two hours, by dragging the scrollbar to the left. When listeners want to leave Timeshift mode and return to live programming, they assume that they will achieve this by dragging the scrollbar to the right. In fact, the return is achieved via the Back-to-Live button. This caused some confusion and, in some cases, led to the crashing of the app. Another problem was related to Spotify integration. This affected both the ‘Replace content with songs from Spotify’ function and the ‘Bookmarking songs’ function. The testers either were not able to connect to Spotify or were not able to replace the live program with songs. In some cases, the live program and songs from Spotify overlapped. A solution for these problems is currently being addressed.
Many test users would listen more to the radio in the car. If the content would be more specific (e.g. specific types of content such as news or culture, having a playlist, the possibility to go back to interesting programme fragments), then testers would also listen more to the radio at home.

“I can imagine listening to more radio with this application, especially at home. Then I could only listen to the cultural content and not sports or the news I already know. Right now I only listen to the radio in the car.” (P8, F, 54).

For testers this would be the radio of the future, because they can freely design their program; e.g. hide or skip content. To have multiple channels in one application would also be a nice extra value for the application.

Important is that users also expressed the need to be brought back to live radio. This demonstrates that users find it important to have control on the skip functionality and also the continued importance of live radio compared to 3rd party streaming providers. Furthermore, since users were able to receive advertising, we learned that users rather prefer to skip advertisements instead of replacing advertisements for a radio item they do not like.

The feedback per prototype is discussed in the following chapter in the detailed analysis of the individual functions.

### 3.3.3. Per feature

In addition to a generic evaluation of the mobile application, respondents were asked to evaluate the specific features via questionnaire and in-depth discussions. 6 features (see table 7) are included in the mobile pilot and on ease of use, necessity and likeability.
### Table 7: Overview features broadcaster-centric prototype

<table>
<thead>
<tr>
<th>Included features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Broadcaster-centric: choosing radio stations</td>
</tr>
<tr>
<td>2. Additional programme information</td>
</tr>
<tr>
<td>3. Timeshifting</td>
</tr>
<tr>
<td>4. Latest news, weather, traffic content</td>
</tr>
<tr>
<td>5. Content substitution via Spotify</td>
</tr>
<tr>
<td>6. Song bookmarking</td>
</tr>
</tbody>
</table>

### Broadcaster-centric: choosing radio stations

*Figure 40: Screenshots ‘Choosing radio stations’ Function*

*The channel selection is not new, but I would miss it nevertheless if it wasn’t there (P2, F, 66)*
Although this feature was not completely included in the prototype due to reasons mentioned earlier, we learn that testers do think it is a valuable and known feature to have. During the workshop, testers were asked what they would choose; multiple channels or new HRADIO features; all testers would prefer the HRADIO features in the HRADIO demo. But the majority of the testers (8/11) stated that they would prefer to have both variants in one application, multiple channels with the new HRADIO features.

**Additional programme information**

Figure 41: Screenshot ‘Additional programme information’ Function

The “radioeins Pilot” application landing page presents pictures of the presenters, displays additional broadcast information, the title of the contribution, song and artist. For example, an additional broadcast information might be the naming of the show like “Der Schöne Morgen” or the title of a contribution might be “concert announcement”.

As can be seen in the figure below, the evaluation of the features ‘add programme information’ is evaluated very positively.
During the workshop discussions it was apparent that none of the testers except for one had mentioned the function ‘additional program information’ explicitly. **The testers did not recognise it as a new feature, but noted that they appreciated the functionality.**

The tester who had recognised ‘additional program information’ as a new feature, expressed the **need for additional textual information about the current program:**

“If you can see the program info at the top (above the slider/timeline), it would be nice if you could get additional information by clicking and selecting the program info.” (P10, f, 32)

**Timeshifting**

In the application, the timeshifting functionality could be accessed at/from three different positions. The majority of the testers (32 from 34 testers) used the function frequently. In addition, it **was rated necessary and the best function of the workshop.** However, 2 testers in the workshop experienced technical difficulties; the time-shifted listening stopped or reacted slowly\textsuperscript{22}.

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\textsuperscript{22} A few technical bugs of the app confused 5 testers – missing programme information, not coming back to live or moving on the horizontal slider when you tapped it.
“Timeshift is very important because you get very annoyed when you miss something.” (P2, F, 66)

Since HRADIO utilizes the DAB signal, advertisements are part of the signal. We learned that users would rather skip advertisements and replace this via a Spotify song, than the other way around (which was originally the use case).

Three different timeshifting possibilities were tested: a) Horizontal timeline (= slider), b) Interactive playlist and c) 15 seconds-rewind.

The program could be timeshifted by up to two hours.

![Screenshot 'Timeshifting' Function](image)

Functionalities delivered by the horizontal timeline and the interactive playlist were valued as most important for users. The least liked form of the timeshift was the time jump 15 seconds rewind in the program. Usefulness and usability of the different timeshifting variants were evaluated separately:
The first timeshift functionality in the application was implemented as a horizontal timeline which could be rewound by up to two hours. The different elements and their meaning were clearly understood by the testers:

“It was clear that the symbols were used to select something specific” (P8, f, 54)

“I think the Slider is totally awesome. However, a workshop leader had to point it out to me because I hadn’t seen it move.” (P7, m, 29)

In the workshop, two testers mentioned they did not always know where they were in the programme. The implemented time stamps to support this, were not recognised by all testers.

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23 The current time could be shifted by clicking and dragging the timeline horizontally. The timeline contains certain elements that mark the starting point of program content, such as concert announcements, weather and traffic reports, news, moderation, spoken audios, programme trailers, headlines and songs.
“I think it’s good that you can see the elements in the timeline so you know what you’ll listen to, but a problem is that I can’t always see where I am without having a visible element in the timeline. (P4, m, 48)"

“The scale division in the slider has not been clear; how far do I have to go if I want to go back 15 to 20 seconds, for example? It would be good to see where you ”land“ when you move the slider“ (P5, m, 58)

“I wasn’t sure where I was in the program, so I liked the playlist better“ (P2, f, 66)

The back-to-live button activated with a colour change from grey to red when it became active. However, due to technical problems, not every tester was able to understand the back-to-live button:

“I rather did not use the Back-to-Live button because it reacted sluggishly or sometimes not at all“ (P5, m, 58)

Interactive Playlist

The second part of the application contains the program contents in a list form, an interactive playlist. The interactive playlist has been the most popular, and most desirable feature with the workshop participants and the overall results are very good. They show that many testers would like to use this feature in a future radio application.

“I find the list of the individual audios at the end very good, so I can directly and specifically select the traffic radio“ (P1, m, 73)

“Timeshifting via the playlist is very important because it is more convenient and easier than using the back-to-live button“ (P2, f, 66)

Here, suggestions are to visualise individual broadcast elements, e.g. add a symbol for RBB events.

“In the playlist, you don’t know when the individual broadcast elements are over - it would be good if you could recognise it“ (P9, m, 32)

24 Next to the horizontal timeline was the back-to-life button which allows returning to the live program from timeshifting mode.
One tester made an interesting suggestion for improvement:

“A symbol for RBB events (concerts presented by RBB, for example) would be cool” (P9, m, 32)

15 seconds-rewind

In the various timeshift possibilities, the variant ‘15 seconds rewind’ was the lowest-rated function and seemed to be superfluous for some testers. 4 testers from the questionnaire and workshop remarked that the time interval of 15 seconds is too short;

“15 seconds-rewind is not so useful for me – too short a time interval, more like jumping back 30 seconds if necessary. The advantage would only be if you were distracted for a very short time.” (P7, m, 29)

Furthermore, the icon was too small for 3 testers and was simply missed.

“15 seconds-rewind is not so important, because the contributions can also be selected via the playlist” (P2, F, 66)

“15 seconds-rewind is familiar to me because I also use time-shifted television, but here I didn’t use it because it wasn’t important to me to take small steps back.” (P3, M, 55)

Latest news, weather and traffic content

Current weather and traffic reports as well as the news are offered in the applications as audio-only25.

25 As mentioned before, the text summary of the audio content was not implemented because it could cause confusion.
Figure 45: Screenshot ‘Latest news, weather and traffic content’ Function

The **function is rated positively**. A tester indicated in the workshop that he can easily imagine headlines and updates with the function of the additional program contents (weather, traffic and news) (P9, m, 32)

![Evaluation of additional content](image)

Figure 14: Evaluation of additional content (Germany, N=28)

**However, 1) a textual summary of the messages is important**, this was also confirmed in pilot 2.

"Additional information to the word contributions would be quite interesting, e.g. to the Tesla contribution. Or it would be good if you could get a text summary of the news as well." (P3, m, 55)
"It would be important to me if news and traffic still had a text content so that I could read it. (P9, m 32)

2) Having the possibility to timeshift and see weather and news in the radio stream made a separate screen for news and weather less important for some users:

"Latest news would not be so important, because testers can select the latest news via the timeshift function anyway." (P2, f, 66)

3) There were UI remarks on the size of the buttons and the graphical display.

"that the three elements should be smaller and have a picture with text information. (P2, f, 66)

"that it could be displayed graphically too." (P9, m, 32)

Content substitution via Spotify

Content substitution refers to the functionality to skip content by linking to Spotify and replacing radio items with Spotify music. Via the settings in the upper right corner users could connect to Spotify.

![Figure 46: Screenshot ‘Content substitution via Spotify’ Function](image-url)

During the workshops content substitution was evaluated as the top ‘novel’ feature together with the bookmarking feature. When evaluating the function,
however, a **distinction** must be made **between** the testers who **habitually use Spotify** or another music streaming service provider and those who installed Spotify for the HRADIO Test.

19 of 34 testers used it. **Some testers didn’t find the function (5)**. Some other testers mentioned that they didn’t need Spotify (4). A **few testers had technical problems** with the connection to Spotify (2) and the remaining testers didn’t give an explicit explanation why they didn’t use the function ‘content substitution via spotify’ (4).

Of the testers who used the functionality, the ‘Inhalte mit Musik via Spotify’ was evaluated as the most relevant.

"I think switching between radio and Spotify is very good, the exchange with Spotify is top because you don’t have to change the station. You can stay on the radio, but the content that is not interesting can be exchanged with Spotify." (P5, m, 58)

"The choice of content was new, because you can skip advertising and music and you don’t have to leave the station, just skip the unwanted content. (P8, f, 54)

In pilot 2 we learned that **users expect to be smoothly brought back to live radio**, here we learn that a ‘ping’ should be included so that users are aware of being brought back to live.

"When I switch to Spotify, I would like to return to the radio program at a certain time, like the beginning of the most recent news. I would like to be able to select this function in the settings." (P6, m, 54)
"For me it would be good if you could skip messages through Spotify and be returned to the radio by a "ping" or similar" (P9, m, 32)

Important is that users at the same time evaluate the substitution functionality as most complex to use. The majority of the testers who tried it for the first time need a written user manual. After installation of the application, there were onboarding slides (see appendix) which pointed out the connection with Spotify, but no explicit instructions for use.

The connection with Spotify or the explanation for it was difficult. I overlooked the function at first, but then I noticed that there were error messages saying that I was not connected to Spotify. Intuitively, I went to the settings and then found the function." (P3, M, 55)

There were several opinions in the workshop explaining their technical problems in more detail, which shows that for some it took technical knowledge to use the feature:

"The connection was not possible via substitution. I deleted the cache in Spotify and allowed connection with other services in Spotify, then it worked" (P5, M, 58)

Suggestions for improvements are therefore to do further research on how this function can be more intuitively used by users without the need for any technical knowledge. All in all, the integration with a streaming service provider, in this case Spotify, was very well received.

Song bookmarking

In the application it was possible to mark/bookmark songs. The bookmarked songs were stored on a playlist in Spotify, which was called "HRADIO Playlist".
Most of the testers want the **song bookmarking feature** to be in their future radio application, together with substitution this feature is marked as **top novel feature**.

We learn that **some did not use the feature because of either non-discovery or that the tester/s were not interested in streaming services**. Similar to substitution, the satisfaction rate depends on whether testers are familiar with Spotify or not. We also learn here that users really stress the **importance of having control over the functionality and at any time can smoothly return to live radio**.
Main motivations to use bookmarking is to relisten to content and the fear of otherwise missing out on important songs. However, users also expect to bookmark spoken audio content or word entries.

“If you could bookmark articles and interviews, it would be very interesting and brilliant.” (P6, m, 54)

“I think it’s good that this function exists, and I would also like it very much if, for example, concert notes could be called up again” (P7, m, 29)

**Important** here is an easy and intuitive structure; by 1) assuring that users know where to find the list of songs and 2) implementing a distinction between saved songs and spoken audio content such as articles or interviews, this could be by creating two separate lists.

“It was not clear to me where I could find the song again. Across the timeline? There was nothing displayed.” (P5, m, 58)

### 3.3.4. Conclusions

In general, the application was very well received by the users in this pilot and evaluation period 3. The concept of hybrid functions was positively received by participants. The verdict of testers indicated that they can well imagine using the application in their daily life, and thus we consider the final iteration of the prototype to be successful.

The picture and table\(^{26}\) below summarize how users evaluated the HRADIO features included in the broadcaster-centric prototype:

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\(^{26}\) This concerns an exercise from the workshop where individual functions were evaluated according to the categories of novelty, desirability and complexity. Testers were asked to finally highlight one feature from each category. The results showed which function has the highest and which the lowest benefit to users.
Table 8: Overall result of the top- and lowest-ranked features per category from the workshops

<table>
<thead>
<tr>
<th>NOVELTY</th>
<th>DESIRABILITY</th>
<th>COMPLEXITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the feature new? Is it</td>
<td>Do you need this feature? Which</td>
<td>How complex is the feature? Do you need more help or additional context to fully understand the feature?</td>
</tr>
<tr>
<td>disruptive? Is it totally</td>
<td>needs does it fulfil?</td>
<td></td>
</tr>
<tr>
<td>new? Does it include an</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aspect which you have not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>experienced before?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOP NOVEL FEATURE**
Content substitution via Spotify and song bookmarking

**TOP DESIRABLE FEATURE**
Timeshifting (Interactive Playlist)

**MOST COMPLEX**
Content substitution via Spotify

**LEAST NOVEL**
Choosing a radio station

**LEAST DESIRABLE**
Timeshifting (15s rewind)

**LEAST COMPLEX**
Choosing a radio station

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![Image](image_url)
The most useful feature was ‘timeshifting in the interactive playlist’, enabling users to discover missed content. The ‘15 seconds rewind’ timeshifting feature was rated the least useful - users preferred to use the playlist to navigate to a specific time point in the program rather than the short rewind function.

In addition, the clear display of the current program and ‘additional program information’ in the playlist were evaluated as very useful. By contrast, the ‘choosing a radio station’ feature seemed trivial to users.

‘Content substitution via Spotify’ and ‘song bookmarking’ are rated as the newest functionalities. The novelty of the ‘interactive playlist’ and ‘content substitution via Spotify’ are equally high. Users expect to not only store music but also other audio content such as articles and interviews, in a separate list. Nevertheless, content substitution is also rated as the most complex function. Both features work in combination with Spotify. The integration of streaming services should in particular be improved. The personal benefit was rated differently. This suggests that users need guidance and a clear structure when being introduced to novel features, here the (non) technical knowledge of users should also be considered.

Important is that users also expressed the need to be brought back to live radio, this demonstrates how users still find it important to have control on the functionality and also the importance of live radio compared to 3rd party streaming providers. Testers expect control and personalisation settings to specify the exact time of return to the live programme, for example the option of setting a specific time so as not to miss the live news. Testers do not expect advertisement in a hybrid radio app and would rather skip it and replace it for a 3rd party song.

Additionally, technical connection problems frustrated the testers, nevertheless this did not prevent testers to indicate the willingness to use the new personalisation and hybrid functionalities that the broadcaster-centric prototype offers in the future.
4. GENERAL CONCLUSIONS

This deliverable discussed the final pilot 3 results and concludes the full user evaluation of HRADIO.

The final pilot tested three prototypes as the concrete end-result of three pilot cycles, which took place in different stages of the HRADIO project. In this final phase, 658 testers tested the concept and the included HRADIO features. We can conclude that users like hybrid radio and rate it as fun. Hybrid is therefore the direction future radio should be heading towards. Despite being confronted with some technical and usability issues during the pilot, the overall concept and features were evaluated positive by our participants. This confirms the potential of the user scenarios and requirements as defined at the start of the project.

We started the HRADIO project with 47 user scenarios for hybrid radio. These scenarios were refined to 27, resulting in seven products of which six were tested in pilot phase 1 in a controlled lab setting. This taught us that timeshifting and cross-device listening functions are an existing need of radio listeners, as they could solve the frustration of ‘missing out on interesting content’. More particularly, the ability to pause live content or to find content on demand was important for users. The need to be kept-up-to-date with information, while also enjoying music is also an interesting learning from pilot 1. Along with a guaranteed signal quality crucial in listeners’ radio experience.

Pilot phase 2 included the six products and the listed user requirements into the development of two prototypes: a mobile application and an in-car application. These prototypes were tested in a semi-controlled setting. Pilot 2 learnings are that users highly value an application with multiple channels on multiple platforms. The platform-centric prototype of pilot 3 was developed to respond to this need. We also learned that features need to have a clear user value adapted to users current needs, or the app will lose its value. A clear example here was the evaluation of the content substitution, where users did not understand the purpose, also because users did not store local content on their phone. We learned that users nowadays make use of streaming applications to save, store and re-listen music and therefore in pilot 3 we opted to test the integration of a third party player, Spotify, for the substitution and favourites function. Furthermore, the mobile application tested in pilot 2 demonstrated the importance of investing time in intuitive UI and UX design, therefore extra UI and UX effort was put in the pilot 3 tested broadcaster-centric prototype. Finally, pilot 2 taught us that users highly expect on-demand content from future radio, the product Daylist defined in pilot 1 was therefore developed and tested as the brand-centric prototype in pilot 3.
Finally, we ended in pilot phase 3 with following learnings:

11) **Hybrid radio’s unique value is the ‘mix’ of on-demand with live radio.** Previous research has shown that certain types of radio items that are characteristic for traditional radio are lost when listening non-linear. Pilot 3 confirmed this requirement, we learned that users value traditional broadcast radio in combination with hybrid radio features such as daylist, timeshifting with a timeslider, content (song and additional content) substitution and favourites. For hybrid radio, more research is needed in terms of how a high level of on-demand content can still be blended with live radio aspects, without overdoing it nor losing the connection with live radio.

12) **Hybrid radio should consider different listening modes, user context, active versus passive features and decision moments.** We notice in general that less people tend to listen to traditional broadcast radio but are pleasantly surprised when re-connected or re-introduced to the surprise effect radio can offer. Radio as “background” entertainment remains therefore important and should also be considered in the development of novel HRADIO features. In that regard, we discovered that there are still multiple radio listening modes, regardless of the “on-demand” reality. Considering the variety in radio listening modes is important when developing a hybrid radio application and features. The use of **listening profiles** in the settings was also a user requirement that resulted from the user testing.

13) **Hybrid radio should invest in offering a flexible user experience on multiple platforms.** Speaking of different modes of listening and coming back to the platform-centric prototype, hybrid radio in car is highly appreciated by users, especially to visually see what is playing, to intuitively switch between channels, receive recommendations according to location and receive news, weather and traffic updates is what listeners define as the radio of the future. In general, connecting with users ‘on the go’ still has lots of potential compared to existing (radio and/or streaming) applications. The **cross-device functionality** developed in pilot 3 is already a nice solution in that regard. Another interesting user insight is the importance of the offline aspect and to be able to download and access content offline. But not only on the go, also when at home, users expect to access content via multiple screens (Smart TV). The flexibility and compatibility here is also an important one to consider.
14) Good signal and audio quality is crucial for radio. The requirement of optimal signal quality was a condition sine qua non when developing hybrid radio applications. Users expect an excellent audio quality at all times.

15) **Hybrid radio should consider high user expectations based on users’ experience with other applications in different (entertainment) domains.** For example, users expect to have similar features as streaming applications nowadays offer for podcasts (e.g. library, favourites, return back, next show, recommendations). In general, throughout the pilots we see that radio listeners (regardless from which profile or current listener behavior) expect HRADIO to offer numerous possibilities in accessing, editing and relistening content. Key features developed here are to return to the beginning of a program, to pause and rewind content, to have advanced search possibilities and to access lists of favourites and stored content (music, programs, news and other audio content). Users like to get a personal playlist as a ‘catch-up’ of what they have missed during the day.

16) **Simplicity and straightforwardness is still the general rule.** Future radio businesses can offer high value if they **find the right formula** to offer users numerous varieties of on-demand versus live radio in a nice, clear and straightforward way, therefore the ‘now playing’ or sometimes called ‘what is it about’ feature is highly important for users. This in terms of the ease of use, possibilities and flexibility the features should have. Clear visualisations of different segments of radio content is an example of a frequent mentioned user requirement.

17) **The most valuable learning is that the novelty factor of hybrid radio features requires extra guidance in terms of user manuals, intuitive UI and UX experiences.** Furthermore, pilot 3 especially taught us that users need time to appropriate hybrid radio prototypes and features to make it their own. Clear instructions on the affordances of the functionalities and on how to use them are therefore essential. Users should also be able to test and explore the application for a longer period of time. This was the case in pilot 3, but the immaturity of the prototype hindered the user experience. As users installed a real application, even with the disclaimer of it being a test, they still expected it to be fully functional without any technical flaws, which was not the case.

18) **Hybrid radio should consider privacy, control and transparency.** Although users expect a certain level of convenience they prefer control. They would like to be able to tweak their playlist to their preference. (e.g. rearrange radio items, like or dislike items to feed the recommendation engine...). The
importance of personalisation is therefore also the common thread throughout the HRADIO project. An important learning for this project is that **clear and accessible user settings** (e.g. opt-in, opt out) are helpful here. Developers and researchers should devote sufficient time to study how this can be provided to users in the best possible way. It should in this sense also be stressed that it should remain a combination of both worlds and users expect that this will not influence their relation with live radio and the broadcast experience. An example of this is the need for a ‘bring back to live’ button, an alarm or a clear sign of what is still going on while listening to a skipped song. Linked to this, we see that users also express the need for **control** on other aspects, especially as a need for receiving sufficient information on the context of this dual relationship (why, what, how, who is storing and owning this data). **Transparency is key when broadcasters decide to link with 3rd party applications.** In addition, broadcasters and radio developers should consider that a choice for a particular platform will always exclude a certain number of users. Sufficient research on this is therefore needed.

19) **Hybrid radio should be social.** Interestingly, the social aspect (to share radio content with friends) is a returning user requirement. This was studied in depth in pilot 2, where users on the one hand would like to have a closer connection with the radio presenters via the use of social media (e.g. twitter, polls of song) but equally and finding from pilot 3, users expect to share content with friends/family and in some cases other listeners (from pilot 1 and 2 learnings).

20) **Hybrid radio should be for free, with an option for a premium account that considers the current package of competing streaming applications.** With regard to learnings related to pay models (premium version) and advertising, we learned that current subscriptions (such as with Spotify) are mainly used to avoid advertising and not necessarily to access different or novel features.

From our evaluation, it is clear that there is a potential for hybrid radio. We should keep in mind that the user acceptance will also depend on how radio is currently used by the audience. In the case of radio in a pure background mode, people will be less inclined to make use of hybrid radio features that require (inter)activity of them. Nevertheless, we did notice a lot of enthusiasm for a more personalised and tailored radio experience and specific validated user scenarios support this need. This indicates that radio, as the most traditional medium of our time, is also ready to enter the digital era.
References


[3] https://www.elastic.co/fr/kibana

[4] https://play.google.com/store/apps/details?id=imu.hradio.hradioshowcase&fbclid=IwAR0L9OzCPzWiyzNnrBZxyaHxZWwnb0HsFFbKqnP~q~RKYXMsHO3IVu1vvjA
5. ANNEX A: PLATFORM CENTRIC PROTOTYPE

CALL TO ACTION PLATFORM APP

**English version**

To all the radio listeners out there, we have some good news!

The new HRADIO (Hybrid Radio) app is available for testing via this link (INSERT LINK). The last few months we have been busy developing a brand new radio app that offers you music and podcasts from multiple radio stations whenever, wherever you are. New to this app is the possibility to save songs from your favorite radio channel, to switch to your Spotify account whenever you want to hear a favorite song and effortless skip back to radio and rewind in case you missed out on the latest radio show. Want to have an upgrade on your current radio experience and like to learn more on what future radio looks like? The app will be available from December 2019 to February 2020. You can help us by testing the app and sharing your opinion by answering a survey at the end of the test!

**German Version**

An alle Radiohörer, wir haben gute Neuigkeiten!

Die neue HRADIO (Hybrid Radio) App ist bereit zum Testen.

Die letzten Monate waren wir schwer damit beschäftigt eine brandneue Radio App zu entwickeln, welche dir, egal wann und wo, Musik und Podcasts von vielen Radiosender bietet.

**Dutch version**

Aan alle radio luisteraars, goed nieuws!

Test nu de nieuwe HRADIO app via deze link! De afgelopen maanden zijn we druk bezig geweest met het ontwikkelen van een gloednieuwe radio-app die muziek en podcasts van meerdere radiostations aanbiedt, wanneer je wil en waar je ook bent. Nieuw is de mogelijkheid om je favoriete liedjes te bewaren, te switchen naar Spotify als je even iets anders zoekt en zonder moeite weer terug met één knop naar je favoriete radioprogramma’s te luisteren. Een programma gemist? Geen probleem dan kan je met de rewind knop terugspoelen! Als je geïnteresseerd bent in het delen van je ervaringen met deze gloednieuwe radio-app en ook meer wilt weten over hoe toekomstig radio-onderzoek eruit ziet, download dan de link hier en wij nemen tijdens de app contact met je op voor verdere evaluatie.

Ben je het verder ook beu om telkens weer opnieuw te zoeken naar een radiostation als je in de auto, op werk of thuis toekomt? Momenteel testen wij een nieuwe functie waarbij je automatisch verder luistert in de radio-app op elk toestel ongeacht waar je bent. Graag
willen we ook jouw ervaring hierin horen tijdens een live test op 20 of 21 januari 2020. Je kan je hier aanmelden.

**Pop-up questions in app**

1. Workshop + survey invite

<table>
<thead>
<tr>
<th>Event</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week of 20 january</td>
<td>The testing is almost finished, we are excited to hear about your experience with the app! Fill out our final survey <a href="#">here</a>. It will take max. 15 minutes of your time. Your input is valuable to us, as it will be used to improve the application.</td>
</tr>
</tbody>
</table>

2. Feature evaluation

<table>
<thead>
<tr>
<th>Event</th>
<th>Message</th>
<th>Answer possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>User skipped a song 3X</td>
<td>Please rate your experience of skipping this item? (1 star = absolutely not satisfied, 5 star = absolutely satisfied)</td>
<td>5 star rating</td>
</tr>
<tr>
<td>User used timeshifting (rewind, fastforward) after 3X</td>
<td>Please rate your experience of timeshifting (rewind, fast forward)? (1 star = absolutely not satisfied, 5 star = absolutely satisfied)</td>
<td>5 star rating</td>
</tr>
<tr>
<td>User used favorites after 3X</td>
<td>Please rate your experience in favoriting this item? (1 star = absolutely not satisfied, 5 star = absolutely satisfied)</td>
<td>5 star rating</td>
</tr>
<tr>
<td>Drop-out (not used the app for 7 days)</td>
<td>Hi, glad you’re back! Please tell us why we lost you?</td>
<td>• Technical issues with the app</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Personal reasons (lack of time, ....)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The concept is different from what I had expected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I am not used to using a radio application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other reasons</td>
</tr>
</tbody>
</table>

**Example evaluation survey (only one feature included as example)**

HRADIO pilot 3 – PLATFORM APP post survey ENGLISH
Start of Block: INTRODUCTION
Q1 Thanks for taking the time to test our application. To finalize this study, we would like to ask you some further questions about your overall experience with the HRADIO app. Completing this questionnaire takes about 15 minutes and the results will be processed anonymously. All collected data will be treated confidentially.

End of Block: INTRODUCTION

Start of Block: DEMOGRAPHICS

Q102 Before evaluating the application and your experience we will ask a couple of basic demographic questions. This will help us in defining larger trends in the data.

Q101 What is your gender?
F (1)
M (2)
X (3)

Q103 What is your age?

Q104 What is the postcode of the town you live in?

Q105 What is your current profession?
I am a student (1)
I work full time (2)
I work part time (3)
I am (currently) not working (4)
I am retired (5)

Q106 What is your highest degree?
No diploma (1)
Secondary level (2)
College level (3)
University degree (4)
Doctorate/ Post Doc/ ... (5)
Others, namely (6)
End of Block: DEMOGRAPHICS

Start of Block: RADIO PROFILE

Q111 How often do you listen to the radio?
Never (1)
Rarely (2)
Monthly (3)
Weekly (4)
Daily (5)

Q113 Where do you listen to the radio?
At work (1)
At home (2)
In the car (3)
Other, namely: (4) ____________________________________________

Q115 Through which devices do you usually listen to the radio (min. once per month). We are referring to radio stations such as BBC Radio 1, Capital FM, Heart and Magic, not music services like Spotify and iTunes.
Traditional radio (FM/AM) (1)
Computer (2)
Smartphone (3)
Tablet (4)
Smartwatch (5)
Car radio - FM (12)
Car radio - DAB+ (6)
Digital DAB or DAB+ device (radio which shows DAB/DAB+ on the front and can receive additional stations beyond FM) (7)
Digital TV (e.g. via radio channels on your digital TV) (8)
Home entertainment system (e.g. Sonos, Bose) (9)
Smart speaker (e.g. Google Home, Amazon Echo, Apple Homepod...) (10)
None of the above (11)

Display This Question:
If Where do you listen to the radio? = In the car

Q123 Which sources do you use to listen to music in the car?
Radio in the dashboard (1)
CD (2)
USB (3)
Bluetooth (4)
Smartphone (5)
Others, namely (6) ________________________________________________

Q117 Do you ever re-listen again to a broadcast radio programme?
E.g. the Archers, World at One, Chris Moyles Show...
Never (1)
Rarely (2)
Monthly (3)
Weekly (4)
Daily (5)

Q119 Which of the following services have you used in the last month? 
Multiple answers are possible:
Spotify (1)
Google play music (2)
YouTube (3)
Apple Music (4)
iTunes (5)
Shazam (11)
Soundcloud (10)
TuneIn Radio (13)
Amazon Music Unlimited (6)
Vimeo (14)
Deezer (7)
Last.fm (8)
Tidal (12)
Beatsport (15)
Qobuz (16)
Napster (9)
I have used other services to stream or search for music, namely (17) ________________________________________________
None (18)

Q121 For which of these services have you paid for music or a subscription to use 
(personal or shared with someone else)?
Multiple answers are possible:
Spotify (1)
Google play music (2)
YouTube (3)
Apple Music (4)
iTunes (5)
Amazon Music Unlimited (6)
Soundcloud (10)
Shazam (11)
TuneIn Radio (13)
Last.fm (8)
Tidal (12)
Vimeo (14)
Beatsport (15)
Qobuz (16)
Napster (9)
Deezer (7)
Other, namely (17) _______________________________
I don’t (18)

Q125 To what extent do you agree with the following statements concerning digital technologies?
With digital technologies we refer to smartphones, tablets but also social media, e-mail, online shopping, gaming, surfing and AI and AR/VR.

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neutral (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am interested in digital technologies (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find it easy to use digital technologies (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In general, I do not trust technology (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find it fun using digital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Page 118 of 152
Digital technologies make our lives easier and more comfortable.

Q127 To what extent do you agree with the following statements concerning digital applications and skills?

With digital applications we refer to applications such as e-mail, social media, online shopping, online banking, gaming and surfing on the web.

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neutral (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident in being able to learn digital skills (1)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Concepts linked to digital applications confuse me (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I avoid digital applications because I am not (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
familiar with them (3)
I am afraid of breaking digital applications or pressing the wrong button if I use them (4)

End of Block: RADIO PROFILE

Start of Block: MOTIVATION

Q109 Now, before starting with the evaluation of the application, what was it that triggered you to download and test the application? (multiple answers are possible)
Friends/family/colleagues recommended it (1)
I know the project (2)
The subject interests me (3)
I work in the radio industry (4)
Other (5) _____________________________________________

End of Block: MOTIVATION

Start of Block: SATISFACTION

Q2 The first questions are about how satisfied you are with the HRADIO application

Q3 Please indicate below to what extent you agree with the following statements:

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither agree, nor disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would recommend the HRADIO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
app to a friend/family member/colleague...

(1)

The HRADIO app is fun to use (2)

The HRADIO app works the way I want it to work (3)

I would like to use the HRADIO app frequently (4)

I am satisfied with the HRADIO app (6)

Q4 Does the HRADIO app match the expectations you had when downloading the app?

Yes (1)

It only partly meets my expectations (2)

No, it did not (3)

No, I did not have any expectations (4)

Display This Question:
If Does the HRADIO app match the expectations you had when downloading the app? = It only partly meets my expectations
And Does the HRADIO app match the expectations you had when downloading the app? = No, it did not
Q68 You indicated that a part or none of your expectations were met, what were these expectations?

_____________________________________________

End of Block: SATISFACTION

Start of Block: USEFULNESS

Q5 The following questions are about **how useful** you find the HRADIO application.

Q6 To what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither disagree, nor agree (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The HRADIO app <em>saves</em> me time when I use it</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HRADIO app <em>meets</em> my needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HRADIO app <em>does</em> everything I would expect it to do</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I would find the HRADIO app <em>useful</em> in my daily life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The HRADIO app <em>makes</em> the things I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q7 Do you have any remarks on how useful or not useful the HRADIO app is?

End of Block: USEFULNESS

Start of Block: EASE OF USE

Q8 The next questions are about how you evaluate the use of the HRADIO application.

Q9 To what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither agree, Nor disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It requires the fewest steps possible to accomplish what I want to do with the HRADIO app (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the HRADIO app is effortless (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use the HRADIO app without written instructions (3)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don’t notice any inconsistencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

want to accomplish easier to get done (7)
as I use the HRADIO app (4)
I can **use the HRADIO app successfully** every time (5)

Q10 Do you have any remarks on how easy or difficult it was to use the HRADIO app?

End of Block: EASE OF USE

Start of Block: EASE OF LEARNING

Q11 The following questions are about how you learned to use the HRADIO application

Q12 To what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither agree, nor disagree (3)</th>
<th>Agree (6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I easily remembered how to use the HRADIO app (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is easy to learn how to use the HRADIO app (2)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>I quickly became skillful with the HRADIO app (3)</td>
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<td></td>
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</tr>
<tr>
<td>I learned to use the</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The HRADIO app collects user data for research purposes and pseudonymizes this data. Pseudonymizes means we do not link any personal information to the data and use a nickname if needed.

Below you can find a list of data. How do you feel towards sharing this data?

Please state your willingness to share for each item below.

<table>
<thead>
<tr>
<th>Not willing to share (1)</th>
<th>Only willing to share if pseudonymized (2)</th>
<th>Willing to share (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surname (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email address (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location (5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: PRIVACY

Start of Block: BEHAVIORAL INTENTION TO USE THE APP
Q18 Would you be willing to pay for a premium account? This would mean paying a monthly sum with access to new functionality like pause, rewind, fast forward; song replacements and recommendations.
Yes, with a monthly budget of € (1)

No, I would opt for a freemium account (2)
No, I would not use the HRADIO app (3)

Q19 Would you listen to radio more often if you would be able to use the HRADIO app in your daily life?
Yes (1)
Yes, if following conditions are met: (2)

No, because (3)

End of Block: BEHAVIORAL INTENTION TO USE THE APP

Start of Block: EVALUATION OF FEATURES - INTRODUCTION

Q20 For the last part of the survey we will ask you some questions on the specific functions of the app

End of Block: EVALUATION OF FEATURES - INTRODUCTION

Start of Block: EVALUATION OF FEATURES

Q123 One of the functions is to favour items (song, program) by pressing the heart icon. In case you have a Spotify account your favorite song will be added to a playlist which you can relisten again afterwards. The picture below illustrates this function.
Q125 Did you use the **favourite song function**?
Yes (1)
No (2)

Skip To: Q129 If Did you use the favourite song function? = Yes
Display This Question:
If Did you use the favourite song function? = No

Q127 Why did you not use the **favourite song function**?
It was not useful (1)
I could not find it (2)
Others, namely: (3) ____________________________________________

Display This Question:
If Did you use the favourite song function? = Yes

Q129 The **favourite song function** is easy to use
- Strongly disagree (1)
- Somewhat disagree (3)
- Neither agree, nor disagree (4)
- Somewhat agree (5)
- Strongly agree (7)

Display This Question:
If Did you use the favourite song function? = Yes

Q131 The **favourite song function** is fun to use
- Strongly disagree (1)
- Somewhat disagree (3)
- Neither agree, nor disagree (4)
- Somewhat agree (5)
- Strongly agree (7)

Display This Question:
If Did you use the favourite song function? = Yes

Q133 I need the **favourite song function** in my future radio application
- Strongly disagree (1)
- Somewhat disagree (3)
- Neither agree, nor disagree (4)
- Somewhat agree (5)
- Strongly agree (7)

Display This Question:
If Did you use the favourite song function? = Yes

Q135 Do you think we should improve the **favourite song function**?
- Yes, the following should be improved (1)
- No, no improvement is needed (2)
- No, because (6) ________________________________________________

**Topiclist Cross- Device Timeshift test (example)**

1. **Pre-test survey**
2. **Introduction (5min)**
   - Do you currently listen to radio in different places? Which places?

   - How do you listen to radio in various places?
     - Do you listen to the same radio application in various places?
       - In Car FM radio, at Home IP radio
         - Yes, what is your experience in this?
           - Both usages provide only linear radio experience .... boring
         - No, what different applications do you use? Why?

   - What do the participants like about how they currently listen to radio in various places?

   - What frustrates them about listening to radio in various places?

   - Would you like to have one application to listen to different devices? Yes....

   - What are your expectations of the test?
     - Easy setup, Finding content easily...

3. **Post-test survey**
4. Evaluation after cross device functionality
5. **General level**
   - What were the first (general) impressions of testing this feature?
     - Visually the feature appears differently on different Clients.
     - “I would like to have

   - Did you find the tasks easy to accomplish? → based upon observations, ask additional questions
     - Yes.....

   - What went well? What didn’t ?
     - Sometimes the audio takes some time to playback stable.
     - Item boarders are not precise (Broadcaster issue)
     - Timeline with images feels cluttered. An EPG Timeline would be better.

   - What aspects did you like? → based upon observations, ask additional questions
     - Skip forward and backward in the Radio items.

   - What aspects didn’t you like? → based upon observations, ask additional questions
     - UI issues Look and Feel over the different devices.

   - What is still missing?
     - Get an overview about what’s going on in other Service (e.g. EPG grid)

6. **Concept level**
Did the cross device feature meet your expectations you had from a future radio interface?
  - Yes, why?
    Yes
  - No, why not

What are for you the unique aspects of this feature?
Segmentation (Item s) TS Buffer.

Would you be willing to pay for a personalised application like this? How do you see this, would you opt for a premium account?
- No….
  - If not, what would still need to change/improve in order for you to be willing to pay for such car radio?
    Offline archive feature. Download button while still in local WLAN ...

Do you think you would listen more to the radio in your car if you had an advanced hybrid radio application like this?
- Yes…

Does it change anything in your involvement with radio / a specific radio station? Do you think the car radio would increase your involvement with specific radio stations?
- Yes, depends on the content of the station but in doubt yes.

How does hybrid radio fit with other current applications you use? Would it replace it? Are you thinking of another app with which you can compare with this?
- Like it is now , it would not replace current apps/sources. Yes, if 3rd party providers could be used more …..

7. Evaluation level

How do you evaluate feature X ?
  - Ease of Use (1-5)
  - Fun to Use (1-5)
  - Necessity (1-5)

Do you think we should improve the cross device function?
  - Yes, the following should be improved
    More consistent Look and Feel over the different plattforms.
  - No, no improvement is needed
  - No, because

How important is it to you that these suggested improvements are implemented?
  - Not at all important (1)
  - Slightly important (2)
  - Moderately important (3)
  - Very important (4)
  - Extremely important (5)

Participants

Table: Overview respondents survey
<table>
<thead>
<tr>
<th>Alias</th>
<th>Language/country</th>
<th>Gender</th>
<th>Age</th>
<th>Radio usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EN</td>
<td>M</td>
<td>45</td>
<td>Daily</td>
</tr>
<tr>
<td>2</td>
<td>EN</td>
<td>M</td>
<td>28</td>
<td>Rarely</td>
</tr>
<tr>
<td>3</td>
<td>EN</td>
<td>F</td>
<td>35</td>
<td>Rarely</td>
</tr>
<tr>
<td>4</td>
<td>EN</td>
<td>M</td>
<td>50</td>
<td>Daily</td>
</tr>
<tr>
<td>5</td>
<td>EN</td>
<td>M</td>
<td>37</td>
<td>Weekly</td>
</tr>
<tr>
<td>6</td>
<td>EN</td>
<td>M</td>
<td>32</td>
<td>Daily</td>
</tr>
<tr>
<td>7</td>
<td>EN</td>
<td>M</td>
<td>65</td>
<td>Daily</td>
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<td>8</td>
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<td>M</td>
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<td>M</td>
<td>52</td>
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<td>GE</td>
<td>M</td>
<td>51</td>
<td>rarely</td>
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<td>M</td>
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<td>Daily</td>
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<td>M</td>
<td>63</td>
<td>Daily</td>
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<td>33</td>
<td>BE</td>
<td>/</td>
<td>72</td>
<td>Weekly</td>
</tr>
<tr>
<td>34</td>
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<td>M</td>
<td>63</td>
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</tr>
<tr>
<td>35</td>
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<td>M</td>
<td>77</td>
<td>Daily</td>
</tr>
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<td>36</td>
<td>BE</td>
<td>M</td>
<td>19</td>
<td>Daily</td>
</tr>
<tr>
<td>37</td>
<td>BE</td>
<td>M</td>
<td>61</td>
<td>Daily</td>
</tr>
<tr>
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<td>BE</td>
<td>M</td>
<td>40</td>
<td>Weekly</td>
</tr>
<tr>
<td>39</td>
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<td>F</td>
<td>29</td>
<td>Weekly</td>
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## Table Overview respondents cross-device workshop

<table>
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<tr>
<th>Alias</th>
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<th>Radio usage</th>
<th>Participated in general test</th>
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<tbody>
<tr>
<td>P1</td>
<td>41</td>
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<td>Weekly</td>
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</tr>
<tr>
<td>P2</td>
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<td>F</td>
<td>Daily</td>
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</tr>
<tr>
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<td>53</td>
<td>F</td>
<td>Daily</td>
<td>Yes, but I did not test it yet</td>
</tr>
<tr>
<td>P4</td>
<td>48</td>
<td>F</td>
<td>Monthly</td>
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</tr>
<tr>
<td>P5</td>
<td>46</td>
<td>F</td>
<td>Rarely</td>
<td>Yes, but I did not test it yet</td>
</tr>
<tr>
<td>P6</td>
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<td>Daily</td>
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</tr>
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<td>M</td>
<td>Never</td>
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<td>ID</td>
<td>Age</td>
<td>Gender</td>
<td>Frequency</td>
<td>Tested</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>--------</td>
<td>-----------</td>
<td>--------</td>
</tr>
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<td>P8</td>
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<td>M</td>
<td>Daily</td>
<td>No</td>
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<tr>
<td>P9</td>
<td>38</td>
<td>F</td>
<td>Daily</td>
<td>No</td>
</tr>
<tr>
<td>P10</td>
<td>53</td>
<td>M</td>
<td>Daily</td>
<td>No</td>
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<td>61</td>
<td>M</td>
<td>Daily</td>
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<tr>
<td>P13</td>
<td>32</td>
<td>M</td>
<td>Daily</td>
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<td>P14</td>
<td>36</td>
<td>F</td>
<td>Daily</td>
<td>No</td>
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<td>55</td>
<td>M</td>
<td>Rarely</td>
<td>No</td>
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<td>Daily</td>
<td>No</td>
</tr>
<tr>
<td>P17</td>
<td>45</td>
<td>M</td>
<td>Daily</td>
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<td>F</td>
<td>Rarely</td>
<td>No</td>
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<td>P19</td>
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<td>M</td>
<td>Daily</td>
<td>No</td>
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<td>F</td>
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<td>F</td>
<td>Weekly</td>
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</tr>
<tr>
<td>P22</td>
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<td>M</td>
<td>Rarely</td>
<td>Yes, I tested it a couple of times</td>
</tr>
<tr>
<td>P23</td>
<td>28</td>
<td>F</td>
<td>Daily</td>
<td>Yes, I tested it a couple of times</td>
</tr>
</tbody>
</table>
User feedback (example)

<table>
<thead>
<tr>
<th>Date</th>
<th>Pilot</th>
<th>User</th>
<th>Message</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.01.20</td>
<td>BELGIUM</td>
<td></td>
<td>App crashes</td>
<td>signaled directly to Konsole on Slack</td>
<td>New update installed</td>
</tr>
<tr>
<td>20.01.20</td>
<td>BELGIUM</td>
<td></td>
<td>Spotify crashes when using substitution. Not possible to change music in Spotify</td>
<td>signaled directly to Konsole on slack</td>
<td></td>
</tr>
<tr>
<td>20.01.20</td>
<td>BELGIUM</td>
<td></td>
<td>Confusion when starting the app and the dropdown menu with &quot;unspecified data&quot;</td>
<td>signaled directly to Konsole on slack</td>
<td>Found the dropdown menu and has now installed the app</td>
</tr>
</tbody>
</table>

Different types of listening modes (pilot 2 results)

Different types of listening modes*

“The active listening mode” is a fan of a personalized radio app, has its favourite programs and expects content on-demand with an ease of timeshifting and content search whenever they want. These users could become more involved if a library of programs is available and if a topic based search is possible.

The “passive” listening mode, has a lower variety in radio use, listens more to radio in the background and values the “surprise” effect of radio. This user is less loyal to one brand and will shift to another channel if needed, they are also open for recommendations. These users could become more involved if cross device listening is possible, to regulate audio and the signal quality is ensured when on transit.

The “in between” listening mode, is already used to using music streaming applications such as Spotify and needs an easy integration with multiple applications whenever feeling the need for different content (cross app listening/substitution?)

*These listening modes are not exhaustive nor exclusive. Users can also shift between these modes depending on the context (see next slide).
6. ANNEX B: BRAND CENTRIC PROTOTYPE

Call to action brandcentric app

De VRT zoekt Radio 1-proeffluisteraars!

Sinds enkele maanden kun je fragmenten van Radio 1 herbeluisteren via de app. Het gaat over korte stukken uit radioprogramma’s uitgezonden de voorbije 48 uur. Met de nieuwe app willen we deze fragmenten op een gepersonaliseerde manier aanbieden.

Zie suggesties verschijnen van fragmenten die je misschien wel leuk vindt, ontdek programma’s die je nog niet kende, luister enkel naar stukken die je écht boeien of ontvang een lijst op maat die rekening houdt met hoeveel tijd je hebt en wat je interesses zijn.

Test onze app en geef tussendoor feedback. Op het einde van het testparcours krijg je een vragenlijst waarin alle onderdelen aan bod komen.

Registreer je hier en geef mee vorm aan de nieuwste versie van de Radio 1-app! (LINK).

Topic list
daylist

Vragen interview Daylist

Demografie

Geslacht:

Leeftijd:

Postcode:

Adres (voor bon):

Huidige beroepstoestand:

Luisterprofiel

Luister je vaak naar de radio? Waar / wanneer? Via welk toestel?

Naar welke zenders heb je de afgelopen maand geluisterd? Waarom deze zenders?
Wat zijn voor jou belangrijke dingen wanneer je naar de radio luistert? (actua / duiding / muziek / …)

Luister je soms naar actua/duidingsprogramma’s? Dewelke? Waarom luister je naar deze programma’s?

Herbeluister je soms bepaalde dingen? Waarom wel/niet?

Heb je interesse om dingen te herbeluisteren? In welke vorm? (korte fragmenten, bv. Radio 1 Select / podcasts / hele afleveringen /…)

**Algemeen - app**

Wat vind je van de app? (vind je deze overzichtelijk / visueel aantrekkelijk / vind je alles makkelijk terug? / gebruiksvriendelijk /…)

Waarvoor heb je de app gebruikt?

Was het gebruik van de app wat je ervan verwacht had? -> wat was goed? / wat kon er beter?

Wanneer heb je de app gebruikt? (locatie, context, moment van de dag) Waarom op dat moment?

Ben je de app blijven gebruiken? Waarom wel/niet?

**Functies in de app**

*Er wordt gevraagd om de app te openen, vervolgens worden er over de verschillende functionaliteiten vragen gesteld*

Stel dat je de app nu zou gebruiken.

Kan je deze openen en vertellen wat je doet?

Wat gaat er goed? Wat gaat er niet goed?

**Checklist voor de verschillende functionaliteiten**

- **Vandaag**: persoonlijke lijst van radiofragmenten
  - Wat vond je van de fragmenten die hierin aangeboden worden? Hebben de items je verrast? (eventueel vragen : termijn 2 dagen -> en dan vervallen, wanneer gedateerd is afhankelijk van type item)
  - Sluiten de items aan bij jouw interesses?
  - Merkte je dat deze op maat gemaakt waren? -> uitleg : implicit / expliciet (implicit -> klikgedrag, hoe meer geluisterd, hoe meer het doorweegt / expliciet -> interesses doorgeven)
  - Wat vind je ervan dat deze lijst op maat gemaakt wordt? Meerwaarde?
  - Had je dit nog duidelijker vermeld willen zien dat dit op maat gemaakt werd?

- **Favorieten**: mogelijkheid om favoriete fragmenten op te slagen
Deze functie gebruikt? Waarom wel / niet?
Wat verwacht je van deze functie?
Waarom zou je een fragment willen opslaan bij favorieten?

Zoeken van fragmenten (onder 3 puntjes, rechtsboven, functie om te zoeken naar fragmenten)
Heb je deze functie gebruikt? Waarom wel / niet?
Naar wat zou je zoeken als je een bepaald fragment zou willen herbeluisteren?

Verwante fragmenten: in het radioscherm (enkel Android), fragmenten verwant aan het huidige radioprogramma herbeluisteren
Heb je deze functie gebruikt? Waarom wel / niet?
Wat verwacht je hiervan? Vind je dit een meerwaarde?

Net gemist (liedjes uit een radioprogramma herbeluisteren)
Heb je deze functie gebruikt? Waarom wel / niet?
Wanneer zou je een liedje willen herbeluisteren?
Vind je dit een meerwaarde?
Zoek je soms liedjes op die je hoort op de radio? (bv. via Shazam)

Vragen over concrete gevallen uit gebruiksgeschiedenis -> Joris levert dit aan

Afsluitende vragen

Dit was een prototype, als we het echt zouden lanceren: wat zouden we echt moeten houden?

Wat zouden we niet persé verder moeten uitwerken?

Wat zouden we nog moeten toevoegen?

(Eventueel extra -> vragen over digitale kennis)

Ben je geïnteresseerd in digitale technologieën? Vind je het makkelijk om nieuwe technologieën aan te leren?

Maken digitale technologieën jouw leven gemakkelijker?
Seven onboarding slides for Broadcaster-centric Application and the landing page

1. **Herzlich willkommen in der HRADIO-radioens-Demo!**
   Erleben Sie Ihr Leidenschaftsparkour auf ganz neue Art und Weise. Wir sagen Ihnen was...

2. **Spotify nutzen**
   Mit einem Klick auf das Zahlenfeld rechts öffnen Sie die Details. Drücken Sie die Schaltfläche. Ihr Spotify-Konto ist die Instanz der Inhalte.

3. **Spotify-Premium-Account**
   Einweisen Sie möchten sich mit Ihrem Spotify-Premium-Account an und können dann genau den Inhalte genießen.

4. **Spotify-Free-Account**
   Oder Sie nutzen Ihren Free-Account und können auszuwählen, welche Inhalte Ihnen interessant sein mögen.

5. **Kein Spotify**
   Sie können die Demo-App auch ohne Spotify nutzen. Aber eine einzigartige Erfahrung.

6. **Datenschutz**
   Alle Informationen zum Datenschutz finden Sie in den Einstellungen.

7. **Wir wünschen Ihnen nun viel Spaß mit der App!**

---

Co-funded by the Horizon 2020 Framework Programme of the European Union
Einverständniserklärung

Projekt
Horizon 2020 EU-Projekt HRADIO

Ziel des Nutzertests

Beschreibung des Nutzertests
Die Testteilnehmer haben die Anwendung auf ihrem Endgerät installiert, um die Anwendung zu Hause zu testen. Im Anschluss haben sie einen Fragebogen zu personenbezogenen Informationen, der eigenen Audio- und Radiennutzung sowie über die einzelnen Funktionen ausgefüllt.
In einem Workshop sprechen die Testteilnehmer in kleinen Gruppen über die Erfahrungen mit der HRADIO Anwendung. Hier stellt die Moderatorin verschiedene Fragen zu den Funktionen der getesteten Anwendung und holt Feedback ein. Der Workshop wird ca. 2 Stunden dauern.

Datenschutz


Einverständnis
Ich, ___________________________, stimme dem Inhalt dieses Dokuments zu. Ich stimme zu, an diesem Nutzertest teilzunehmen.

Ich stimme zu/ich stimme nicht zu (bitte entsprechend kennzeichnen), dass die für Projektberichte oder Projekt-Website gemachten Bilder verwendet werden können.

Datum:

Unterschrift:

Rückfragen können gerichtet werden an: Simone Hollederer, Rundfunk Berlin-Brandenburg, Mariene-Dietrich-Allee 20, 14482 Potsdam, simone.hollederer@rbb-online.de.
Datenschutzbeauftragte des rbb: Anke Naujok-Simon, Masurenallee 8a-14, 14057 Berlin, E-Mail: Datenschutz@rbb-online.de.
Datenschutzhinweis

Für diese mobile Test-App des Rundfunk Berlin Brandenburg, verfügbar über den Google Play Store gilt folgende gesonderte Datenschutzbestimmung

Der Schutz Ihrer personenbezogenen Daten ist dem rbb ein wichtiges Anliegen.


Nachfolgend finden Sie Informationen, welche personenbezogenen Daten durch den rbb erhoben, verarbeitet oder gespeichert werden:

Stand vom 20.01.2019

1. Kontaktdaten des Verantwortlichen

Verantwortlicher im Sinne der EU-Datenschutz-Grundverordnung (DS-GVO) und anderer nationaler Datenschutzgesetze sowie sonstiger datenschutzrechtlicher Bestimmungen ist der:

Rundfunk Berlin-Brandenburg (rbb) vertreten durch die Intendantin Anstalt des öffentlichen Rechts Masurenallee 8-14 14057 Berlin

2. Kontaktdaten der Datenschutzbeauftragten

Datenschutzbeauftragte des Rundfunks Berlin-Brandenburg (rbb) ist:

Anke Naujock-Simon Masurenallee 8-14 14057 Berlin

E-Mail: Datenschutz@rbb-online.de

3. Erhebung personenbezogener Daten

Der rbb erhebt und verwendet personenbezogene Daten seiner Nutzer grundsätzlich nur, soweit dies zur Bereitstellung einer funktionsfähigen App sowie der Inhalte und Leistungen erforderlich ist.

Die vorübergehende Erhebung der Daten ist erforderlich, um eine Auslieferung der App an Ihr Endgerät zu ermöglichen und deren Wiedergabe zu gewährleisten. Rechtsgrundlage dafür ist Art. 6 Abs. 1 S. 1 lit. e) DS-GVO.

Die Daten werden zudem bis zur Beendigung der Testphase am 30.04.2020 gespeichert, um ggfl. eine Plausibilitätsprüfung der Testmethode durchzuführen. Eine Zusammenführung dieser Daten mit der anschließenden Umfrage findet nicht statt. Rechtsgrundlage für die Speicherung in Logfiles zur Plausibilitätsprüfung ist Art. 6 Abs. 1 S. 1 lit. f) DS-GVO. Darin liegt zugleich das berechtigte Interesse an der Datenverarbeitung.

Der rbb arbeitet mit dem technischen Dienstleister Konsole Labs GmbH zusammen. Konsole Labs hat seinen Sitz in Deutschland und die erhobenen Logfiles werden in auf Servern in Deutschland gespeichert. Der rbb hat mit dem Konsole Labs eine Vereinbarung zur Auftragsverarbeitung abgeschlossen.

Es besteht die Möglichkeit, sich mit Spotify zu verbinden. Das Nutzen dieser Funktion ist freiwillig. Dazu finden Sie unter Einstellungen die Möglichkeit, Spotify auszuwählen und sich mit Ihren Nutzerdaten bei Spotify anzumelden.


Folgende Möglichkeiten haben Sie zur Verbindung mit Spotify:

Anmeldung mit Ihrem Spotify-Premium Account und uneingeschränkt Inhalte ersetzen können.

Anmeldung mit Ihrem Spotify-Free Account und gemäß den Spotify-Regularien 6 mal pro Stunde Inhalte ersetzen können.

Registrierung eines neuen Spotify-Free Accounts und gemäß den Spotify-Regularien 6-mal pro Stunde Inhalte ersetzen können.

Keine Anmeldung oder Registrierung mit Spotify. In diesem Fall steht Ihnen die Nutzung der App ohne das Ersetzen der Inhalte zur Verfügung.
Hier finden Sie die Datenschutzerklärung von Spotify.


5. Ihre Rechte

Werden personenbezogene Daten von Ihnen verarbeitet, stehen Ihnen als Betroffener im Sinne der Datenschutzgrundverordnung (DS-GVO) folgende Rechte gegenüber dem Rundfunk Berlin-Brandenburg (rbb) als Verantwortlichen zu:

Sie haben das Recht, vom rbb nach Maßgabe der gesetzlichen Bestimmungen Auskunft über die zu Ihrer Person verarbeiteten personenbezogenen Daten zu verlangen (Art. 15 DS-GVO). Sie haben darüber hinaus ein Recht auf Berichtigung und/oder Vervollständigung der Sie betreffenden unrichtigen oder unvollständigen personenbezogenen Daten (Art. 16 DS-GVO). Ferner haben Sie das Recht auf Löschung gemäß Art. 17 DS-GVO. Unter den in Art. 18 DSGVO genannten Voraussetzungen haben Sie das Recht auf Einschränkung der Verarbeitung. Sie haben zudem das Recht, jederzeit gegen die Verarbeitung der Sie betreffenden personenbezogenen Daten Widerspruch einzulegen (Art. 21 DS-GVO). Entsprechende Begehren richten Sie bitte an innovationsprojekte@rbb-online.de

Wenn Sie der Ansicht sind, dass Sie bei der Verarbeitung der Sie betreffenden personenbezogenen Daten durch den rbb oder durch einen vom rbb beauftragten Drittanbieter in Ihren schutzwürdigen Interessen verletzt sind, steht Ihnen das Recht auf Beschwerde bei einer Aufsichtsbehörde zu (Art. 77 DS-GVO). Das ist für den journalistischredaktionellen Bereich die Datenschutzbeauftragte des Rundfunks Berlin-Brandenburg; für die übrige Verwaltungstätigkeit ist der/die Berliner Beauftragte für Datenschutz und Informationsfreiheit zuständig, Kontakt: https://www.datenschutz-berlin.de/kontakt.html

Wenn Sie darüber hinaus Fragen zur Verarbeitung Ihrer persönlichen Daten oder zum Datenschutz beim rbb haben, wenden Sie sich bitte an die Datenschutzbeauftragte des Rundfunks Berlin-Brandenburg, Kontakt: Datenschutz@rbb-online.de.
Overview participants

Methodology to define the Diverse Radio profile
Variety in radio profile is established by 4 questions:
How often do you listen to the radio? (daily = 3, weekly = 2, rarely = 1)
Where do you listen to the radio? (3 or more than 3 places = 3, 2 places = 2, 1 place = 1)
Which devices do you listen to the radio? (3 or more than 3 devices = 3, 2 devices = 2, 1 device = 1)
Which applications did you use for music the past month? (3 or more than 3 applications = 3, 2 applications = 2, 1 application/none = 1)
 Ranking: 0-4 = low / 5-8 = in between/ 9-12 = high

technology interest (A) and technology skills (B), coding below for each question.
A) To what extent do you agree with the following statements concerning digital technologies? (High = 10-5, In between = 5-0, Low = 0 to -10)
B) To what extent do you agree with the following statements concerning digital applications and skills? (High = 8-4, In between = 4-0, Low = 0 to -8)
IF A & B are equal, that technology profile of A&B is used.
IF A & B are different, the technology profile is “in between”.

<table>
<thead>
<tr>
<th>Alias</th>
<th>Gender</th>
<th>Age</th>
<th>Diverse Radio Profile</th>
<th>(A) Technology Attitude</th>
<th>(B) Technology Skills</th>
<th>Technology Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester 1</td>
<td>M</td>
<td>73</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Tester 2</td>
<td>M</td>
<td>46</td>
<td>High</td>
<td>In between</td>
<td>High</td>
<td>In between</td>
</tr>
<tr>
<td>Tester 3</td>
<td>F</td>
<td>67</td>
<td>In between</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Tester 4</td>
<td>F</td>
<td>38</td>
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<td>High</td>
<td>High</td>
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<td>High</td>
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<td></td>
<td></td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Tester 6</td>
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<td>42</td>
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<td>In between</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Tester 7</td>
<td>F</td>
<td>54</td>
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<td>In between</td>
<td>In between</td>
<td></td>
</tr>
<tr>
<td>Tester 8</td>
<td>M</td>
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<td>High</td>
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<td></td>
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<td>High</td>
<td></td>
</tr>
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<td>Tester 13</td>
<td>F</td>
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<td>High</td>
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<td></td>
</tr>
<tr>
<td>Tester 14</td>
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<td>High</td>
<td></td>
</tr>
<tr>
<td>Tester 15</td>
<td>F</td>
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<td>High</td>
<td>In between</td>
<td>High</td>
<td></td>
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</tbody>
</table>
### Topic list developed by imec and used for the focus group at RBB:

**TOPIC GUIDE – FOCUSGROUP**

**INTRODUCTION (10’)**

Thank everyone for contributing.
- State that the results are very valuable, that you will get more in depth at the end of the workshop.
- Indicate that if someone wants to share their experience, or say something important they can say it now.

What will the set-up of the workshop look like?
- **Agenda**
  1. Round table as introduction
  2. Personal exercise on the app
  3. Group exercise on the features
  4. Some final conclusions and insights from the test
  5. Last round
- The workshop will be recorded – ask them to sign informed consent
- There are no good or wrong answers
- Explain what you will do with the results, why their answers are so valuable

**ROUNDTABLE (10’)**

- What do you expect from radio in the future and how does the app respond to this?

**PERSONAL EXERCISE (5’ preparation, 10’ discussion) (15’)**

- **GOAL:** define what are the unique aspects of the app?
D5.3: Final report on pilot evaluation

- TASK: everyone receives some time to answer two questions on paper, they can use bullet points
  - What do you value when listening to radio?
  - Looking at the app, what are the strong points?
  - Would you listen more to radio with an application like this?

<table>
<thead>
<tr>
<th>Name:</th>
<th>Answers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you value when listening to radio?</td>
<td></td>
</tr>
<tr>
<td>Looking at the app, what are the strong points?</td>
<td></td>
</tr>
<tr>
<td>Would you listen more to radio with an application like this?</td>
<td></td>
</tr>
</tbody>
</table>

GROUP EXERCISE (20’ PREPARATION, 30’ DISCUSSION) (‘50)

Features:
1. The logo’s, full station names, now-playing information
2. Switch stations, find new ones
3. Bookmark
4. Time shifting
5. Featured content
6. Podcast integration

Evaluation level:

<table>
<thead>
<tr>
<th>NOVELTY</th>
<th>DESIRABILITY</th>
<th>COMPLEXITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the feature new? Is it disruptively new? Totally new? Does it entail an improvement you did not experience before?</td>
<td>Do you need this feature? What needs are fulfilled?</td>
<td>How complex is the feature? Do you need help, more context to understand the feature?</td>
</tr>
</tbody>
</table>
D5.3: Final report on pilot evaluation

<table>
<thead>
<tr>
<th>3 TOP NOVEL</th>
<th>3 TOP DESIRABLE</th>
<th>3 TOP COMPLEXITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3 LEAST NOVEL</th>
<th>3 LEAST DESIRABLE</th>
<th>3 LEAST COMPLEX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Explanation:
- Each group receives 3x a package of all features (6 packages in total, 36 cards in total, 18 cards per group)
- Each group needs a leader that will explain the group dynamics in the discussion round
- (1) Ask the group to start with the left column and rank the 6 features, they have to choose the 3 most novel features and the 3 least and ask them to stick the features to the paper. After that they continue doing the same for the desirability column and the complexity column
- (2) ask for every top and every least ranked feature to choose one and to either add a green sticker (for the top) and a red sticker (for the least)

Discussion (!!!) = most important
- Every representative of the group explains per column why 3 top, 3 least
- Ask them if there were differences in the group or similarities
- Ask why they choose 1 as top feature, and 1 as least top feature.

RESULTS OF STUDY (15)
- Make a summary of what has been said and what was clear from the study (survey)
- Are there still some surprising elements?
- Ask for feedback on how they experienced the testing as a whole:
  - filling in a survey; coming to a workshop …

FINAL CONCLUSIONS (’5)
- Final round table
  - A last word, sentence, expectation, … something participants would like to add?
- Short explanation of the next steps of the project
- Arrange incentive

Extra figures
IN GENERAL, HOW DO YOU RATE THE USEFULNESS OF THE APP

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>4</th>
<th>24</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>VERY USELESS</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>USELESS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEITHER USEFUL NOR USELESS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USEFUL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VERY USEFUL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE APP SAVES ME TIME WHEN I USE IT
- strongly disagree: 2
- disagree: 7
- neutral: 11
- agree: 11
- strongly agree: 3

THE APP MEETS MY NEED
- strongly disagree: 1
- disagree: 4
- neutral: 13
- agree: 12
- strongly agree: 4

THE APP DOES EVERYTHING I WOULD EXPECT IT TO DO
- strongly disagree: 6
- disagree: 12
- neutral: 14
- agree: 2
- strongly agree: 5

I WOULD FIND THE APP USEFUL IN MY DAILY LIFE
- strongly disagree: 2
- disagree: 2
- neutral: 8
- agree: 17
- strongly agree: 5

THE APP MAKES THE THINGS I WANT TO ACCOMPLISH EASIER TO GET DONE
- strongly disagree: 1
- disagree: 5
- neutral: 8
- agree: 10
- strongly agree: 2

Figure x: Rating usefulness (Germany, N=34)

IN GENERAL, HOW DO YOU RATE THE USABILITY

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>5</th>
<th>6</th>
<th>17</th>
<th>8</th>
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<tbody>
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<td>VERY DIFFICULTY</td>
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<td></td>
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<tr>
<td>DIFFICULTY</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEUTRAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EASY TO USE</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VERY EASY TO USE</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure x: Rating usability (Germany, N=34)
Below a summarized overview is provided of the value of listening to radio, the added value of the tested app and its listening behaviour:

<table>
<thead>
<tr>
<th>What do you value when listening to radio?</th>
<th>High quality of the programme</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Latest information and news, interviews</td>
</tr>
<tr>
<td></td>
<td>Interesting word spoken content such as documentaries and podcast in general</td>
</tr>
<tr>
<td></td>
<td>low advertising</td>
</tr>
<tr>
<td></td>
<td>to listen to different music</td>
</tr>
<tr>
<td></td>
<td>recommendations for outdoor activities</td>
</tr>
<tr>
<td></td>
<td>discovering new music</td>
</tr>
<tr>
<td></td>
<td>authentic reporting and language</td>
</tr>
<tr>
<td></td>
<td>listen to specific radio shows</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Looking at the app, what are the strong points?</th>
<th>The possibility to go back to interesting programme audios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Having a playlist for my favourite songs via the connection with spotify</td>
</tr>
<tr>
<td></td>
<td>intuitive navigation and handling</td>
</tr>
<tr>
<td></td>
<td>the specific choice of particular topics, such as only the news</td>
</tr>
<tr>
<td></td>
<td>having a mobile application</td>
</tr>
<tr>
<td></td>
<td>having an interactive Playlist</td>
</tr>
<tr>
<td></td>
<td>the latest news weather and traffic information</td>
</tr>
</tbody>
</table>
| Would you listen more to radio with an application like this? | No, because I listen to the radio a lot in my daily life  
Possible yes, because I usually only listen to radio at home or in the office, not on the road  
Yes, because I would select the programme more specifically and also listen to more personalised content |