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## **D4.1: Stakeholder feedback on exploratory mock-ups**

Deliverable 4.1 reports on (the evaluation of) incrementally refined mock-ups of envisaged MARCONI services and solutions. The proposed MARCONI mock-ups are intended to investigate, at an early stage in the MARCONI lifecycle, how specific needs of listeners and radio makers can be accommodated. We followed a user-centered approach to design these mock-ups, using a unified evaluation methodology to assess them with end users. In this deliverable we reflect on the design process followed, articulate the lessons learnt, and outline the next steps for these mock-ups and MARCONI's UCD approach in general.

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## EXECUTIVE SUMMARY

This document elaborates on a set of exploratory MARCONI mock-ups that were incrementally refined and assessed with domain experts. As such, this deliverable reveals relevant requirements to address the needs of both listeners and radio makers.

One of the challenges we faced for creating these mock-ups was to translate the scenarios and use cases that emerged from WP1 into early visual representations, such as sketches and screen sequences. The value of such visual representations is delineating preliminary design solutions for the MARCONI platform, and enabling us to assess these solutions with potential users. We tackled this challenge by following a collaborative, user-centered design approach.

As part of our user-centric process, we organized an intra-consortium mock-up workshop. Using techniques from co-design and contextual design, this workshop served to pinpoint the most relevant WP1 concepts that deserved deeper investigation. These concepts, listed below, reflect on the state of the art of related tools - including the gaps in existing tools that could be addressed by the MARCONI platform. As such, they served as basis for creating incrementally refined mock-up designs:

- Radio app for listeners
- GDPR-related matters and consent screens for listeners
- Chatbot functionality for listeners
- Editorial interfaces for radio makers – searching and messaging functionalities

We ensured that each of the resulting mock-ups adhered to user requirements by following a unified evaluation methodology involving domain experts from either the listeners or the radio makers stakeholder group. This unified evaluation methodology consisted of two steps. The first step was to organize early feedback sessions to gather the opinions of relevant users using the “*I like, I wish, what if*” technique. As a second step, we organized early, formative user evaluations. These evaluations were guided using a *cognitive walkthrough* to demonstrate functionality, after which the input of test participants was gathered using questionnaires and an interview.

The results of the MARCONI mock-up evaluations provide the following high-level recommendations:

1. Listeners need a clear understanding of what the MARCONI platform has to offer. Listeners expect transparency about how MARCONI functionalities might improve their radio experience, and about how personal data is collected and processed.
2. Radio makers need supportive services (a) for overviewing the sentiment of their audience on a particular discussion topic, and (b) for interacting with listeners, especially on-air.

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## ABBREVIATIONS

<b>UCD</b>	User-Centered Design
<b>(G)UI</b>	(Graphical) User Interface
<b>ASQ</b>	After-Scenario Questionnaire
<b>GDPR</b>	General Data Protection Regulation
<b>MARCONI</b>	Multimedia and Augmented Radio Creation: Online, iNteractive, Individual

# 1 Introduction

This deliverable reports on the incrementally refined non-functional MARCONI mock-ups, focusing on their design and assessment with target users. The goal of these mock-ups is to erect a bridge between the conceptual work conducted as part of WP1 and the WP2 and WP3 implementation efforts. More specifically, the MARCONI mock-ups reflect on the most relevant services and solutions emerged from WP1 explorations. As such, this document is highly linked with the outcomes of D2.1 (scenarios and use cases). The produced mock-ups and their assessment findings will be used to inform and drive the development tasks in the scope of WP3.

This deliverable elaborates on the mock-up activities that have been implemented as part of MARCONI's user-centric design and development methodology. Mock-ups are an easy and inexpensive means to visualize abstract notions and to compare alternative (GUI) designs. Multiple types of mock-up activities have been conducted throughout the first 9 months of the MARCONI project, each serving specific purposes; each of these different types of mock-up efforts will be chronologically described in a dedicated section in the remainder of this deliverable.

The first set of mock-ups, described in [Section Exploration Phase](#), were preliminary and exploratory in nature in that they were intended to concretize WP1 findings and to explore the MARCONI design space. Here, the primary objective was to drive consortium discussion around the MARCONI concepts and use cases (as identified in WP1) by visually representing them. As such, this mock-up exploration phase has helped the (technical) consortium members to grasp the conceptual WP1 results. All mock-ups produced as part of this exploratory phase were designed independently by individual consortium members.

At the Hilversum plenary meeting (on March 27-28, 2018), an intra-consortium mock-up workshop was then organized to reach consortium-wide involvement in the MARCONI mock-up activities (see [Section Intra-Consortium Mock-up Workshop](#)). Contrary to the first set of mock-ups, the mock-ups authored as part of this workshop were jointly designed by (representatives from) at least two consortium members. The goal of this workshop was to *process* and *prioritize* the end-users requirements defined in the scope of WP1. The workshop yielded as output a set of collaboratively created mock-ups and additionally resulted in consolidated agreements on preliminary design directions.

Up to this point in the mock-up activities timeline, the produced mock-ups primarily served illustrative purposes and were therefore typically not formally assessed by their target audience(s). When the time came to start the stakeholder evaluation of MARCONI mock-ups, a unified mock-up evaluation methodology was jointly developed by UHasselt, VRT, NPO and SFilter. This methodology is described in [Section Unified Mock-up Evaluation Methodology](#) and was applied by all mock-up partners to safeguard evaluation consistency. The findings that emerged from the application of this methodology during stakeholder mock-up assessment can be found in [Sections 3 – 6](#) of this deliverable.

Finally, [Section Discussion and Concluding Remarks](#) reflects on the outcomes of the mock-up phase of the MARCONI UCD process, and outlines the next steps in WP4.



## 2 User-Centered Approach for Creating MARCONI Mock-ups

As defined by the ISO standard for Human-centered design for interactive systems (9241-210), User-Centered Design (UCD) is “an approach to interactive systems development that aims to make systems usable and useful by focusing on the users, their needs and requirements, and by applying human factors/ergonomics, and usability knowledge and techniques” [4]. At its core, the UCD approach follows three high-level principles to guide design activities: involve users from the start and throughout the design process, use empirical measurement to evaluate the design proposals with users, and follow an iterative design methodology to improve the proposed solutions based on user feedback [3].

In the scope of the MARCONI project, we follow a UCD process for two main reasons. First, to address the needs of the radio makers and listeners – our two categories of target users – throughout the entire design and development cycle of the platform. Second, to integrate and take advantage of the diverse expertise areas and viewpoints of the members of the MARCONI consortium (i.e., media industry, research and academia, technical innovation, etc.). The work described in this deliverable is a reflection of the efforts of the MARCONI partners to integrate this diversity of skills and viewpoints for creating initial user interfaces.

According to the ISO standard [4], the objective of the UCD process is producing an interactive application to be deployed and tested with end-user. This process follows iterative cycles consisting of the following high-level stages:

1. Understanding and defining the context of use of the application,
2. Delineating requirements based on the needs of users,
3. Producing design solutions according to the requirements, and
4. Evaluating the solutions with the end-users in consideration of the requirements.

The activities reported in this deliverable are mostly focused on stages (3) and (4), as we iteratively designed and evaluated design solutions according to the user requirements defined in WP1. Figure 1 gives an overview of the phases that we used for (1) framing and (2) iteratively designing and evaluating our mock-ups.

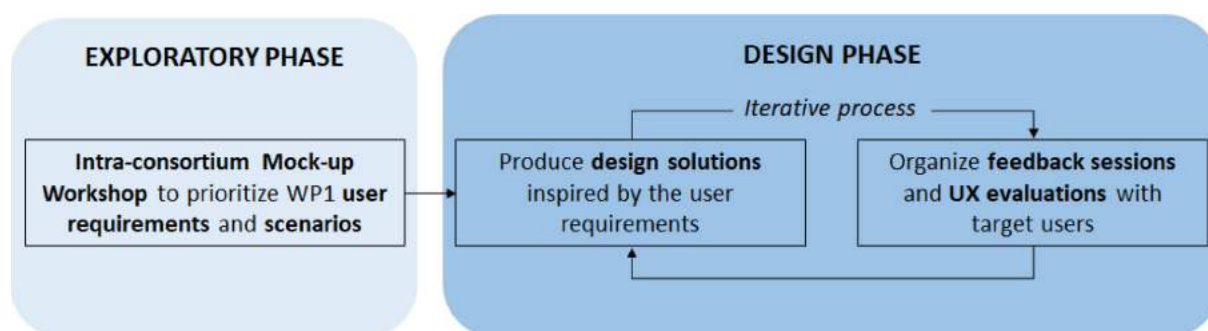


Figure 1. Exploratory and Design Phases followed by the MARCONI consortium partners to frame (left - light blue) and iteratively design and evaluate (right - dark blue) initial mock-ups.

The MARCONI mock-up activities started off with an *exploratory phase* where we organized an *intra-consortium mock-up workshop*. The goal of this workshop was to frame the design space for the mock-ups by visually representing the envisioned MARCONI scenarios and use cases (see D1.2 – Section 2). As such, this exploratory phase was primarily intended to link WP4 with WP1 by translating the abstract

notions (e.g. MARCONI use cases and scenarios) into concrete concepts and visualizations. These visualizations were evolved into initial design solutions, and were represented as workflows and preliminary mock-ups. The resulting preliminary mock-ups were then exploited to elicit consortium feedback on important MARCONI services and features.

The *design phase* aimed to refine MARCONI problem definitions and to propose alternative solutions. The design problems that we tackled at this stage were based on the outcomes of the exploratory phase, and are consistent with the priorities and interests of the MARCONI partners involved. While the design process was unique for each partner based on their own expertise and methodologies, we followed a *unified approach for evaluating the proposed design solutions*. The sections below present an overview of the exploratory and design phases we followed.

## 2.1 Exploratory Phase – Intra-Consortium Mock-Up Workshop

The exploratory phase consisted of an *intra-consortium mock-up workshop* to *process* and *prioritize* the end-users requirements defined in D1.2. The purpose of this workshop was to collaboratively create initial mock-ups and to reach consortium-wide agreement on preliminary design directions. Additionally, with this workshop, we ensured that the user knowledge generated in WP1 was adequately transferred into WP4.

### 2.1.1 Methodology

The workshop was held on March 27th 2018 at Hilversum, The Netherlands, having the involvement of 14 participants, with one participant only joining for the first activity. All consortium members were represented by at least one workshop participant. The workshop had a duration of 3.5 hours (including 10 minutes for the workshop's introduction and a 30 minutes break), and was facilitated by members of the UHasselt team. As illustrated in Figure 2, the activities conducted during the workshop were steered with three sequentially executed core activities: (1) *relating scenarios with screen elements*, (2) *sketching workflows and mock-ups*, and (3) *sharing and prioritizing ideas*.



Figure 2. Core activities organized during the intra-consortium mock-up workshop.

Following principles of contextual design [1], these core activities focused on evolving concepts from abstract representations of requirements (e.g. scenarios), into coherent workflows and visual representation of functionalities (e.g. mock-ups). The value of the applied workshop method was for the MARCONI consortium to frame and elaborate on user interfaces by focusing on the user needs and identifying the WP1 concepts that could benefit from refinement. Over the next sections, we present the details of these core activities.

#### 2.1.1.1 ACTIVITY 1: RELATING D1.2 SCENARIOS WITH SCREEN ELEMENTS

The goal of the first activity was to “put accumulated WP1 knowledge into action”, by exploiting this knowledge to envision user interfaces for the MARCONI platform – both for listeners and radio makers. We used D1.2 as a starting point to collaboratively detect potential design directions for the MARCONI mock-ups. With this activity, we aimed to transfer the knowledge generated within WP1 into WP4, and

to tackle the challenge of transforming predominantly textual scenarios into visual mock-ups. Activity 1 lasted around 30 minutes, and was closely coordinated with WP1 leaders.

In preparation of Activity 1, we set up the workshop room by posting on the wall five A0 posters, each containing a textual and basic visual representation of a D1.2 scenario. Participants were given post-it notes, and were instructed to walk around the room, to read the scenarios, to write down the *screen elements* they could identify in each scenario, and to attach the resulting post-its at the relevant location on the poster. We defined screen elements as “features, interfaces, or user actions that need to be included in the MARCONI platform”. We used this technique to stimulate active participation from the workshop attendees, by asking them to stand up, to reflect on the different aspects of the scenarios, and to relate these aspects to concrete user interface components of the MARCONI platform. This activity, illustrated in Figure 3, was done individually and with minimal discussion between participants, as we wanted to gather as much information as possible.

(a)



(b)

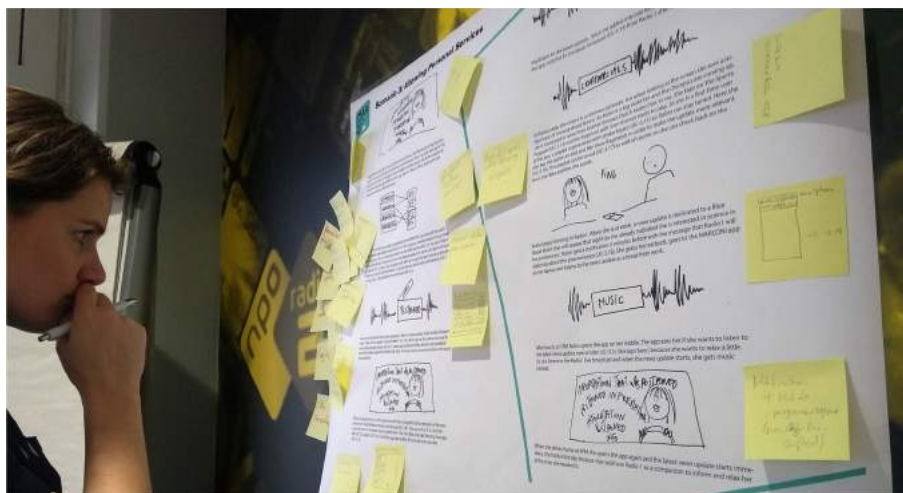


Figure 3. Intra-consortium mock-up workshop: (a) Overview of Activity 1; (b) Zoom-in into one of the WP1 scenario posters, annotated with post-its by different participants.



The outcomes of this activity were five annotated posters. Each post-it represented an identified “screen element,” represented in a textual or visual way. As a result of this activity, participants gained awareness of the WP1 use cases; and at the same time, we identified design spaces for MARCONI mock-ups, hereby integrating the perspectives of all consortium members.

### 2.1.1.2 ACTIVITY 2: SKETCHING MARCONI WORKFLOWS AND MOCK-UPS

The second activity focused on materializing the results of Activity 1. We asked participants to use the “screen elements” extracted from the scenarios (see Figure 3) for creating workflows and preliminary mock-ups. As detailed in Table 1, 13 participants contributed to this activity. Participants were divided into 5 teams. Two teams explored Scenario 1 (S1), as two posters were created from respectively the radio maker and listener viewpoint. The remaining three teams explored Scenarios 2, 3, and 4 (S2 – S4). This team division was used to facilitate the inclusion of different points of view, and expand the design space coverage by exploring different alternatives.

*Table 1. Scenarios and Participants of Activity 2.*

MARCONI stakeholder group	Team	D1.2 Scenario per Team	No. of participants
Listeners	1	S1.2: Facilitating Relevant Feedback	3
	2	S3: Allowing Personal Services	2
	3	S4: Providing Content on Demand	2
Radio makers	4	S1.1: Facilitating Relevant Feedback	3
	5	S2: Co-Creating Content	3

Activity 2 lasted around two hours, and was followed by a 30-minute break. Each team was given sketching material (e.g. paper, markers, scissors, etc.), and the A0 poster with an annotated D1.2 scenario (see Figure 3).

This activity was divided in two tasks. The first task was for each group to elaborate on the “screen elements” (as identified during Activity 1) from their assigned D1.2 scenario, with the objective of turning them into an operational workflow. Organizing the screen elements into a workflow helped participants to reflect on the concrete elements that compose the scenario. Participants were granted around 30 minutes for completing this task. They were instructed to focus on the overall workflow and functionalities, such as people and third party applications involved, and to ensure that every aspect of the scenario was covered. As a second task, participants were asked to sketch the user interfaces (i.e. mock-ups) required to realize the drafted workflow. Participants were instructed to consider the workflow, elements of the GUI and its layout, interactions, and functionalities. They were also asked to detect possible inconsistencies in the scenarios and to explore multiple design alternatives whenever possible. The mock-ups were done using a simple format (see Figure 4) to sketch ideas on how to represent the user interfaces and to annotate these sketches with additional information about the goal of the corresponding interface.

(a)



(b)



Figure 4. Intra-consortium mock-up workshop: (a) Overview of Activity 2; (b) a Zoom-in into one of the preliminary mock-ups created during the session.

The outcome of the second step of the workshop was a set of workflows, early mock-ups, and other sketches that served as a basis for design explorations. Details of these outcomes are presented in [Section 2.1.2.](#)

### 2.1.1.3 ACTIVITY 3: SHARING OUTCOMES AND PRIORITIZING CONCEPTS

The third activity of the intra-consortium mock-up workshop consisted of a plenary presentation of the sketches generated by each team (see Table 1). As illustrated in Figure 5, a representative of each team explained the workflow and the created mock-ups. The objective of Activity 3 was to communicate the outputs of the activity, and to discuss at a consortium-wide level possible challenges and opportunities for the drafted mock-ups. This activity lasted around 20 minutes.



*Figure 5. Plenary workshop and mock-up presentation by a team representative during Activity 3 of the intra-consortium mock-up workshop.*

After the plenary presentations, the media partners (NPO, VRT, and SFilter) were given stickers to mark the individual concepts (e.g. workflow section, mock-up feature) that they deemed as most relevant for their organization. This technique facilitated the division of follow-up mock-up tasks between consortium members.

### 2.1.2 Outcomes of the Workshop

The artefacts created during the workshop were disseminated among the consortium partners after the session. These artefacts included photos of the mock-ups and workflows created, and a list of the concepts and features extracted from the mock-ups that were prioritized by the MARCONI media partners during the workshop (Activity 3). We further discussed and drilled down this list during a follow-up remote meeting. This meeting facilitated the demarcation of the envisioned scope and level of refinement of the prioritized mock-ups, and additionally served to divide ensuing mock-up tasks among the MARCONI partners according to their expertise and interests. The prioritization list, included in Table 2, details the scenario from which the concept or feature emerged. The majority of features included in this list are discussed in the scope of this deliverable.



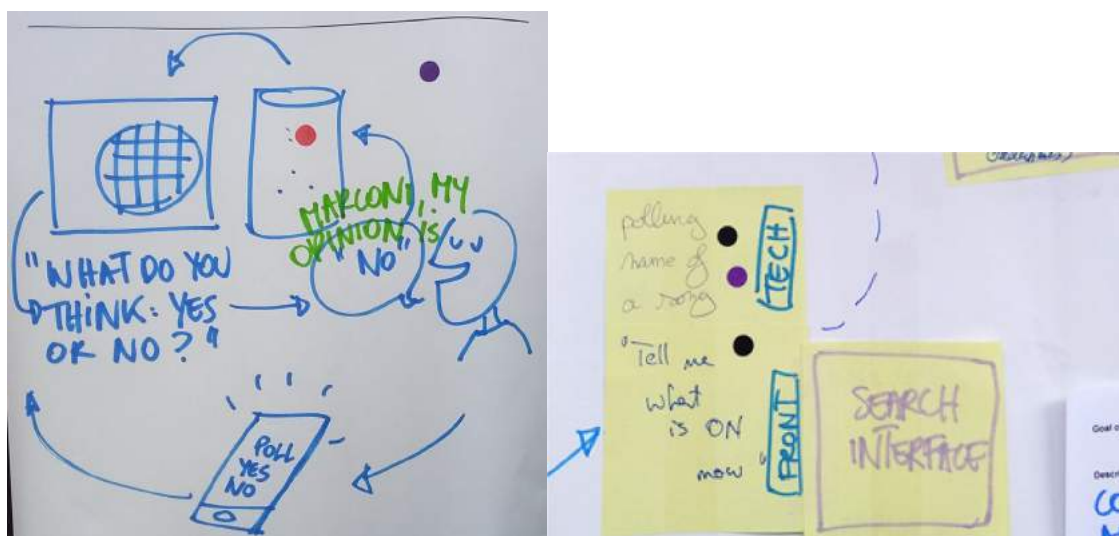
Table 2. Features prioritized during the intra-consortium mock-up workshop and follow-up virtual meeting between VRT, SFilter, NPO, and UHasselt.

## IDEA #1

**Scenario:** S4 | **Stakeholder(s):** Listeners

**Concept or feature:** Initiating polls with listeners (e.g. sharing opinions, answering trivia, etc.).

**Focus for D4.1:** Explored by NPO (see [Section 3](#))

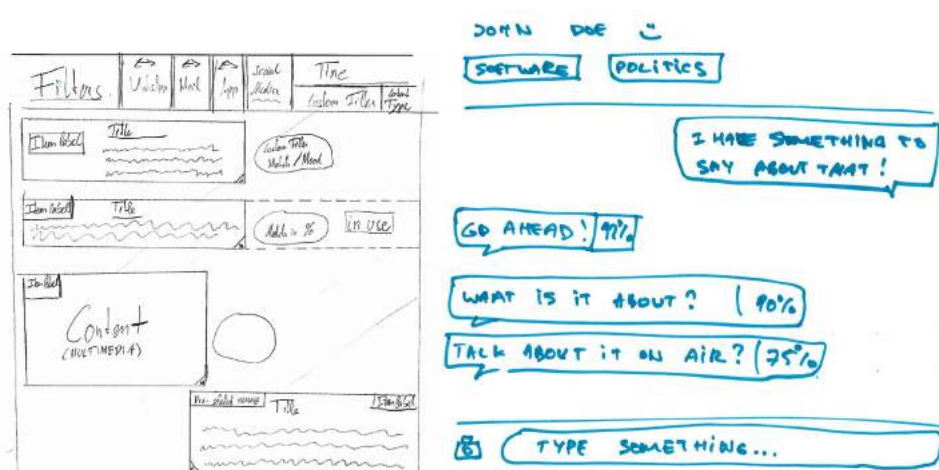


## IDEA #2

**Scenario:** S1 & S2 | **Stakeholder(s):** Radio makers

**Concept or feature:** Messaging system for radio makers: sending custom messages to audience, displaying message information (e.g. labels, ratings, etc.), contacting audience “with one click”.

**Focus for D4.1:** Explored by VRT & UHasselt (see [Section 4](#) and [Section 6](#))

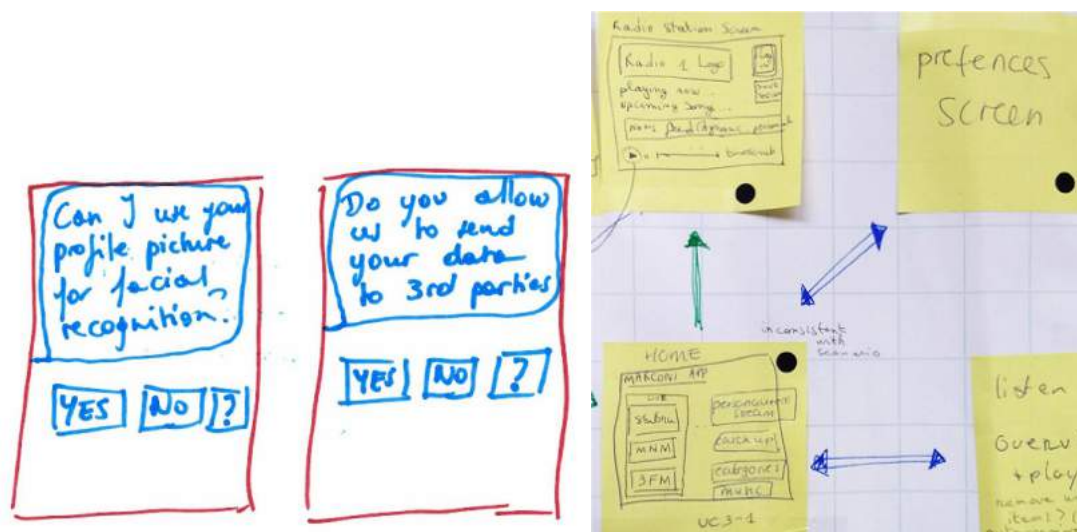


## IDEA #3

**Scenario:** S1, S3, & S4 | **Stakeholder(s):** Listeners

**Concept or feature:** Personalized app and/or chat for listeners: exploring FB chat integration, switching radio stations, consuming content on-demand, content and data privacy policy

**Focus for D4.1:** Explored by NPO and SFilter (see [Section 3](#) and [Section 5](#))

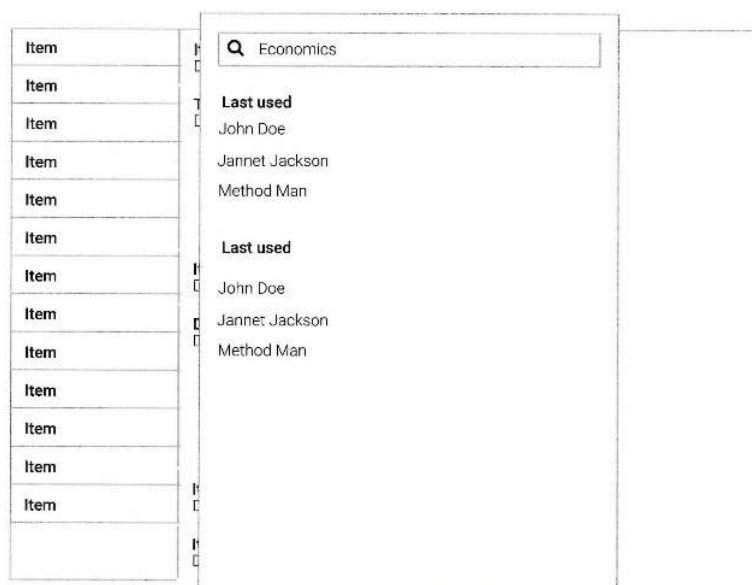


## IDEA #4

**Scenario:** S1 & S2 | **Stakeholder(s):** Radio makers

**Concept or feature:** Search functionalities for radio makers

**Focus for D4.1:** Explored by VRT (see [Section 4](#))

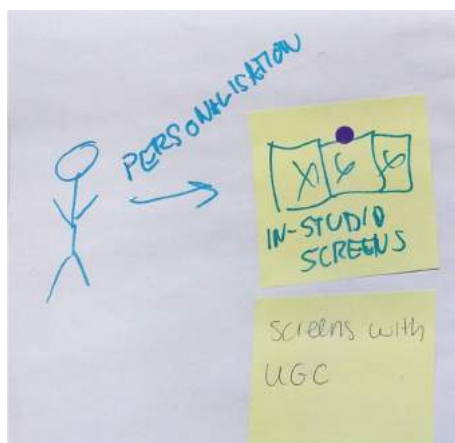


## IDEA #5

**Scenario:** S1 | **Stakeholder(s):** Radio makers

**Concept or feature:** Personalization of in-studio screens for radio makers

**Focus for D4.1:** Briefly explored by VRT (see [Section 4](#)) – not a priority at this stage of the project.



## IDEA #6

**Scenario:** S1 | **Stakeholder(s):** Radio makers

**Concept or feature:** Message analysis and audience filter and profiling

**Focus for D4.1:** Not a priority at this stage of the project



Some of the features listed in Table 2 formed the basis of MARCONI's design phase, which will be described next in the section below.

## 2.2 Design Phase

### 2.2.1 Mock-Up Creation

Unique and flexible design processes were applied to the ideas outlined in Table 1, according to the skills and preferences of the designers / researchers involved. For instance, NPO used Google Design Sprints (See [Section 3](#)), while VRT, SFilter and UHasselt used co-creation approaches (See [Section 4](#), [Section 5](#), and [Section 6](#)). Having different approaches to design activities is valuable to ensure the exploration of alternative solutions, while keeping the users at the center of the design process. To keep consistency and a common thread to weave the different mock-ups together, the MARCONI media partners created the mock-ups in close consultation with each other, for instance by exploiting the expertise of different partners within the consortium to improve early versions of the mock-ups (see collaboration between UNIVIE and SFilter in [Section 5](#), and between Pluxbox and UHasselt in [Section 6](#)). Furthermore, all mock-ups were explored at similar levels of fidelity. We focused on creating low-fidelity prototypes that were iteratively refined (e.g. from pen-and-paper sketches to digital mock-ups). Using this level of fidelity was agreed upon in order to elicit feedback from users while avoiding limitations of specialized prototyping tools. However, the specific set of employed design tools and techniques was defined by each partner individually.

### 2.2.2 Unified Mock-Up Evaluation Methodology

While mock-up design and creation was customized on a per partner basis, a unified mock-up evaluation methodology was defined to cross-partner harmonize the user assessment of MARCONI mock-ups. By jointly drafting and then diligently applying a unified methodology, the quality and the consistency of the individual mock-up evaluations was ensured. The user evaluation methodology consisted of two steps, both involving domain experts: early feedback sessions and formative usability evaluations. By conducting these mock-up evaluations, we discovered opportunities for iterating our design proposals. The findings of both the early feedback sessions and the formative usability evaluations were integrated iteratively into the different mock-ups as detailed in [Sections 3 to 6](#).

#### 2.2.2.1 EARLY FEEDBACK SESSIONS

The objective of the early feedback sessions was to gather open feedback about the existing mock-ups, and explore ideas for future iterations of the mock-ups. Gathering feedback on early concepts and sketches is useful to ensure that prototypes meet the needs of the targeted end-users [6].

We outlined a general methodology for these early feedback sessions that could modestly be adapted by involved consortium partners. For instance, the sessions could be organized either in individual or group settings, and were expected to last between 20 and 45 minutes. The technique for gathering feedback was uniform for all sessions, as we used the “I like, I wish, What if” method proposed by the Stanford d.school [8]. This method allows for gathering feedback from users during testing sessions in a structured way [9]. We selected this technique because of its flexibility, and since it enables to collect input from users in a constructive manner, enabling open discussion and personal reflection. Conversation is encouraged by asking participants to generate “I-statements” in terms of positive feedback (likes), ideas for improvements (wishes), and new ideas (what ifs) [8,9]. For example, “I like that I can send messages to my audience”, or “What if it includes an option for downloading content”.

The procedure for the early feedback sessions consisted of two simple steps. First, participants were introduced to the test situation, and were introduced to the existing concepts or mock-ups (either paper or digital versions). As a second step, participants were invited to provide feedback with “I like”,



“I wish”, and “What if” statements. Complementary to this technique, we encouraged participants to explore ideas in a visual way, especially for the “what if” statements.

### 2.2.2.2 FORMATIVE USER EVALUATION

The objective of the formative evaluations was to assess the user experience and detect potential usability issues for the mock-ups created by each partner. Formative evaluations are useful to ensure that the proposed solution meets the user requirements and expectations [6]. Our goal was to investigate both the strengths and the aspects to improve of the MARCONI mock-ups and, most importantly, to assess if the mock-ups were in line with the expectations of either listeners or radio makers. We expected that the elicited feedback would help to identify the most important features and critical problems of the tested mock-ups.

We followed a unified procedure to conduct these small-scale, formative user evaluations with end-users. However, each partner had the freedom to tweak the details of this procedure, according to the characteristics of the to-be-tested mock-up as well as resource availability. The tests were expected to be facilitated by a MARCONI team member. The participant target size was between 3 and 5 representative end-users per test. The sessions could take place in individual or group settings, with an estimated duration between 30 and 90 minutes (e.g. depending on the amount of tasks, number of participants, etc.). Figure 6 is a visual representation of the 3-step procedure we defined for the formative user evaluations.

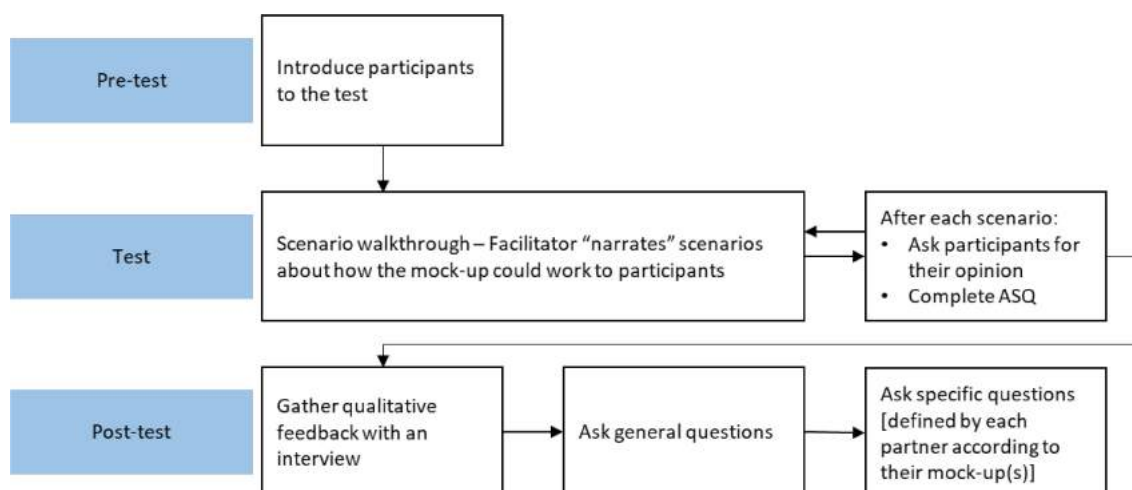


Figure 6. Outline of the procedure for conducting user evaluations for the MARCONI mock-ups

The *pre-test* step included to welcome test participants and introduce them to the test situation, hereby addressing possible privacy concerns, signing informed consent as required, and explaining the goals of the test and its procedure.

The *test* step included the exploration of the mock-ups using a technique similar to cognitive walkthroughs. This technique involves “walking through a task with the product and noting problematic usability features” [6]. We selected the cognitive walkthrough technique given its efficiency for examining usability issues, and that it focuses on goals associated to a particular mock-ups. This technique is flexible enough to be used for the evaluation of prototypes with different levels of detail. As such, it facilitates, for example, the exploration of usability issues during early, formative evaluations of low-fidelity prototypes. On the negative side, the risk of this technique is to gather mostly high-level feedback.



Each partner (VRT, SFilter, NPO, UHasselt) defined dedicated tasks reflecting on the most important things that users must be able to accomplish with the MARCONI mock-up under test. Tasks were clustered by task scenarios. Each task scenario contained around five simple tasks that concerned a set of features and interactions with the mock-up. The test step was expected to last between 15 – 30 minutes, according to the amount of task scenarios. The task scenarios provided a brief background to set the context of the tasks. The facilitator “narrated” each task scenario to participants and simulated interactions using the prototype. As suggested by Bødker [2], we used this technique to provoke ideas and envision future situations relevant for the participants. An example of a scenario and associated tasks is illustrated in Table 3.

*Table 3. Example of task scenario and its composing tasks for the formative user evaluation.*

<b>Scenario</b>	You are an avid listener of this radio station, and just downloaded the new app for interacting with your favorite DJ. You want to find a topic you care about, and post relevant questions.
<b>Task 1</b>	Create an account.
<b>Task 2</b>	Log in to the application.
<b>Task 3</b>	Select a topic you want to ask a question about.
<b>Task 4</b>	Start a conversation with your favorite DJ.

After each task scenario was completed, we prompted participants to give critical feedback on different aspects of the mock-up. In particular, participants were asked to complete an adapted version of the After-Scenario Questionnaire (ASQ). We selected this questionnaire as a fast and comprehensive way to capture user satisfaction and usability in the context of scenario-based studies [5]. The ASQ includes the following questions, with responses being collected on a 7-point Likert scale (ranging from strongly disagree to strongly agree, with the midmost option denoting a neutral opinion):

1. Overall, I am satisfied with the ease of completing the tasks in this scenario
2. Overall, I am satisfied with the amount of time it took to complete the tasks in this scenario
3. Overall, I am satisfied with the support information (online help, messages, documentation) when completing the tasks

Each partner was free to adapt the questions slightly in order to fit their task scenarios and tested mock-up(s). For instance, for mock-ups that did not include “support information” at this stage (e.g. help, message errors, etc.), the last question of the ASQ (#3) could be changed to “Overall, I am satisfied with the information available in the mock-up when completing the tasks.”

Finally, the *post-test phase* included an interview to gather the overall impressions of participants and basic demographic information. We used a semi-structured protocol including three general questions about the usability of the mock-up, and a set of questions specific to the profile of the participant (e.g. listener or radio maker) and the tested mock-up.

## 3 NPO: Audio on Demand and Chatbot Mock-ups

### 3.1 Introduction

NPO developed mock-ups for two use cases described in deliverable D1.2, namely ‘allowing personal services’ and the set-up of a ‘chatbot as a service for the listener’. These mock-ups and their encompassing use case context align with the future vision of NPO: create more personalized radio experiences for listeners, and alleviate the workload of the editorial team (i.e. using chatbots) while at the same time improving the service delivered to the listener.

### 3.2 Audio on Demand

This use case is about ‘allowing personal services’. The mock-ups for Audio on Demand were developed with the goal to investigate what a personal radio service for NPO should contain. Therefore NPO organized two Google design sprints to investigate the following items:

- How can we offer on demand content per station/target audience?
- How can we offer customized news per individual radio station?
- How can we best personalize content via the app?
- How can we engage listeners to consume more and longer NPO content?

#### 3.2.1 Phase 1: “Audio on Demand” Versus Linear

A Google design sprint is a five-phase framework (see Table 4) that helps answer critical business questions through rapid prototyping and user testing. For this initial Audio on Demand study, this five-phase framework was mapped to a five-day time span as follows:

*Table 4. First Google design sprint framework – Audio on Demand.*

DAY 1   Understand	DAY 2   Sketch	DAY 3   Decide	DAY 4   Prototype	DAY 5   Validate
Map out the problem space and create a shared brain. Decide on objectives, give explanation of process, and talk with experts to gather as much information as possible.	Generate a broad range of ideas and narrow down to a select group. Share inspiration and find solutions to the investigated problem.	As a team determine what to prototype to answer sprint questions. Take decisions and draft a storyboard.	Build only what is needed to validate ideas in a very short time frame.	Test with 5 users and get valuable evaluation feedback.

### Involved Participants

We invited 9 employees from NPO, from different departments like the digital & marketing department, Radio 3FM, the research department and NPO Radio 1 (Table 5 and Figure 7) to participate in the first Audio on Demand sprint.

*Table 5. Overview of participants - first Google sprint for Audio on Demand.*

Participant	Job
001.F	Digital Manager NPO Radio
002.M	Manager Marketing & Business Intelligence NPO
003.M	Researcher NPO
004.M	Site manager Radio 1 NPO
005.F	Designer NPO
006.F	Digital coordinator marketing
007.M	Data scientist
008.M	Editor NPO Radio 2
009.M	DJ NPO 3FM



*Figure 7. Participants – first Google design sprint for Audio on Demand.*

**Day 1** of the sprint was spent by participants delineating the goal and (expected) customer journey(s).

The goal was defined as follows: in a few years more people should listen to NPO content, over a longer period of time, and with a more personal listening experience linked to on demand content of the NPO brands and their existing distribution platforms.



## D4.1 Stakeholder feedback on exploratory mock-ups | Public

The most important (f)actors of the customer journey:

- Active (digital) listeners
- Choices based on needs
- Listening to a personalized program
- The system learns to know its individual listeners

The two main questions for the sprint were formulated as follows:

- How do we get to know our listeners and convince them to listen to more content?
- How can we create a personal experience for the listener?

**Day 2** consisted of gathering a lot of ideas (see Figure 8), hereby inspiring each other and identifying possible solutions to our main questions.



Figure 8. Many different ideas evolving at the end of the second day of the Google design sprint.

On **day 3** of the Google design sprint, everyone in the team judged the different ideas produced during day 2. In the end, one idea was selected as winner: **My radio app**, a smartphone app that combines easy access to live radio with an option to create your own personal program based on your preferences. This idea was materialized in the form of a storyboard (based on the best elements out of the day 2 ideas), that served as input for a prototype that has been built on day 4 of the sprint.

On **day 4** the complete mock-up was developed. The mock-up offered a button to directly 'listen live' but also gave the users the option to create their own radio station or program, based on a set of preferences. After setting his/her preferences, the user could consume an automatically generated playlist containing items that matched those preferences. There was also an option for users to register and save their preferences for future use, and also to consume "related content".

The following is a brief description of the composing screens of the mock-up (see Figure 9), along with a discussion about how users could navigate between these screens (such navigation is called “customer journey” in the Google design sprint terminology).

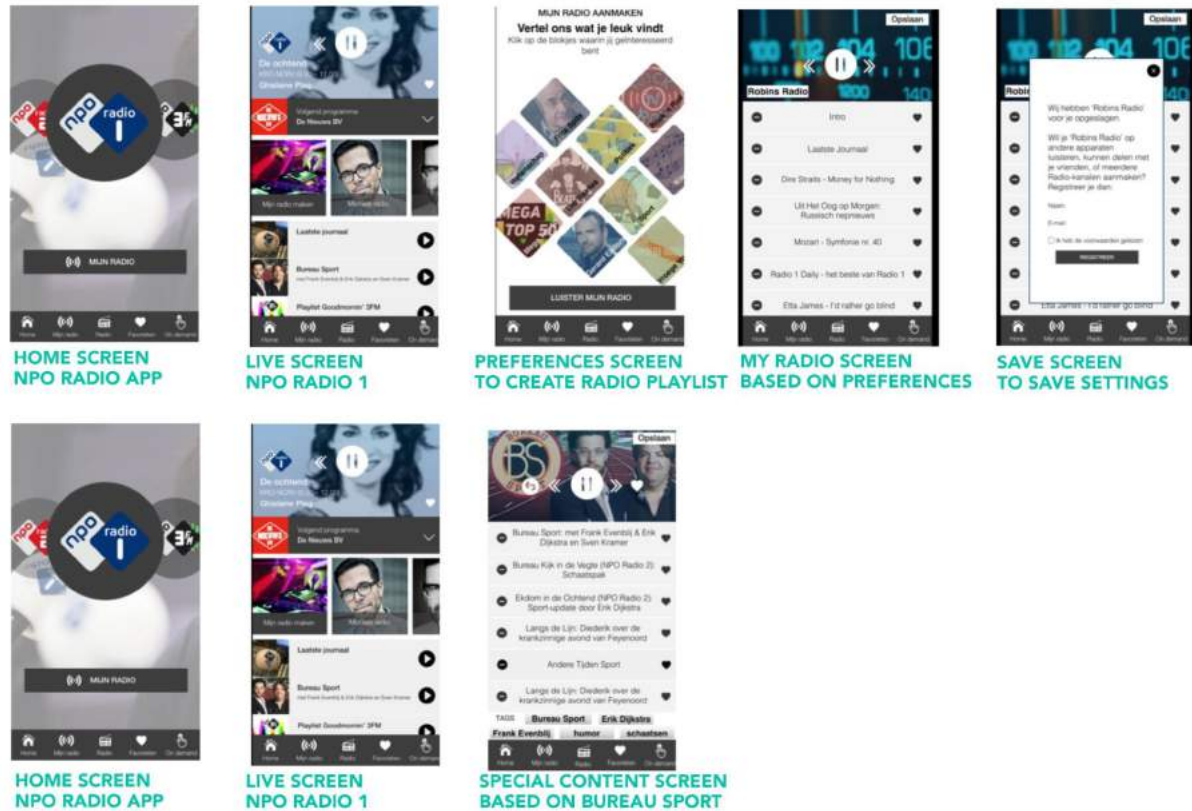


Figure 9. Flow of customer journeys: from listening live to the creation of a personalized station.

**Listen live:** In the home screen of the ‘My radio app’, the listener could select a radio station (leftmost screen in Figure 9 titled ‘Home screen NPO Radio app’) and then that station would immediately start playing (second screen to the left in Figure 9, titled ‘Live screen NPO Radio 1’). Also, supplementary information would be given to the user (i.e. what is playing now) so that he/she gets to know more about the program on air. Also more content is displayed, as can be seen by the items below in the ‘Live screen NPO Radio 1’-section, like e.g. ‘Latest news’ and ‘Bureau Sport’ (a program of NPO Radio 1) to provide the user more listening possibilities when he or she loses interest in the broadcast and would otherwise switch to another station. The user could in the test click on ‘Latest news’ and ‘Bureau Sport’ and then those sections would start playing ‘on demand’. An example can be found in Figure 9 in the section ‘Special content screen based on Bureau Sport’.

**Preferences:** By clicking the ‘mijn radio’ or ‘mijn radio maken’ button, users could create their own playlist. The buttons can be found in Figure 9 in the sections ‘Home screen NPO Radio app’ and ‘Live screen NPO Radio 1’. In order to create a personalized radio playlist with the ‘my radio’ option the user could tab certain preferences based on the station he or she just listened to. In Figure 9 the user listened to NPO Radio 1, so the depicted preferences (as shown in Figure 9 above the title ‘Preferences screen to create radio playlist’) were based on topics like science and sports, or musical genres like rock ‘n roll or older artist like the Beatles. This selection is kind of broad, but here could be tested which genres or topics would appeal to users. After a selection is made, the user could start listening to his/her own channel (‘My radio screen based on preferences’ in Figure 9).

**Register:** If the user likes what he/she created, the personalized list/station could be saved by registering ('Save screen' in Figure 9).

**Other content:** Other than the live radio broadcast, the "listen live" screen would feature links to other radio content. By clicking these links, users could get access to relevant on demand content that they would find appealing, as can be seen by the items below in the 'Live screen NPO Radio 1'-section in Figure 9, like e.g. 'Latest news' and 'Bureau Sport'. Selected content would be rendered in a dedicated screen, along with its metadata (as is the case in the "listen live" screen); this dedicated screen would also show suggestions for related content (see 'Special content screen' in Figure 9). Selectable "other content" could be another radio program than the one the user is currently listening to on demand (in this case: Bureau Sport), but also a recommended playlist with songs.

### 3.2.2 Phase 2: "Audio to Go" NPO Radio 1

**Disclaimer:** Content has been removed from the public deliverable. This section is only accessible to members of the MARCONI consortium.

## 3.3 Chatbot as a Service for the Listeners

NPO has created in total three versions of a chatbot mock-up, starting with a rudimentary version which was then refined into two follow-up mock-ups, based on the intermediate test results and on new developments in the MARCONI technical work packages (i.e. WP2 and WP3).

The goal of the chatbot functionality is two-fold. On the one hand, it aspires to facilitate the editorial team and relieve their workload by answering FAQ automatically. On the other hand, this tool can help service listeners better, in a more personal fashion; this in turn is expected to stimulate interaction between the DJ/editorial team and the listeners, so that the audience is getting more engaged with the radio station.

### 3.3.1 Phase 1

The first test consisted of quite a simple version. This mock-up spanned a button to 'Contact the studio', a login screen, the option to set preferences (in a few categories like dossiers, world, culture & media, sports, science and tech, research and consumer) and a chat screen with questions and answers. The mock-up is illustrated in Figure 10.



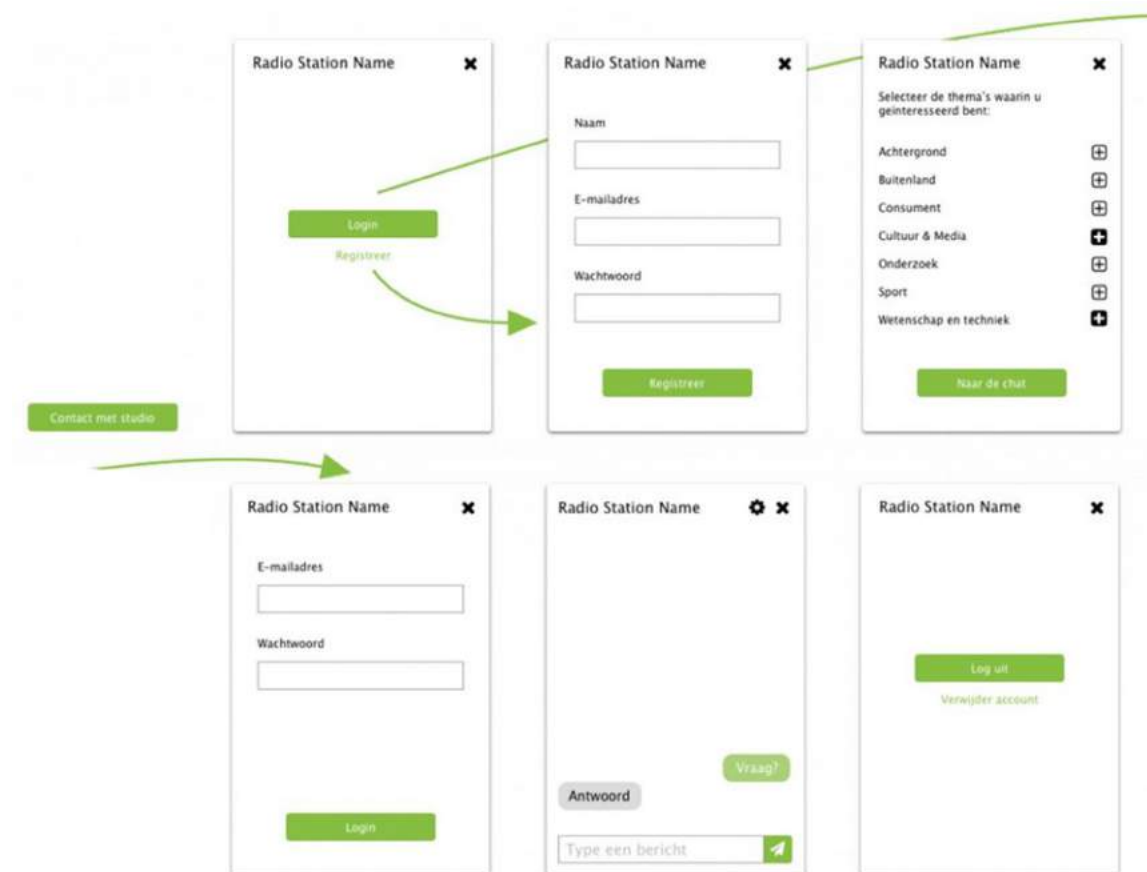


Figure 10. First mock-up of the chatbot (Phase 1).

### 3.3.2 Phase 2

Based on the evaluation results of the first chatbot mock-up (see [Section 3.4.2](#)) and given evolutions related to (semi-)automatic listener interaction in the MARCONI technical WPs, we created a refined version of the chatbot mock-up. Because we are intending to develop a pilot for NPO Radio 5 at a later stage in the MARCONI lifecycle, the second chatbot mock-up simulated a situation where the chatbot is integrated in the NPO Radio 5 website (<https://www.nporadio5.nl/>). As such, the graphical design of this mock-up aligned with the design of the NPO Radio 5 website.

Multiple mock-up versions were prepared, which differed in the way the chatbot functionality could be accessed in the NPO Radio 5 website. Figure 12, Figure 13, and Figure 16 show alternative versions that grant chatbot access via respectively a round icon in the right corner at the bottom of the page (as seen in Figure 11, second image), and as an option in the footer menu of the website (see Figure 12). In Figure 13, the chatbot could be accessed via the 'praat mee' button in the header menu. Finally, the mock-up in Figure 16 leverages a content block in the news feed of the website as a portal to the chatbot functionality.

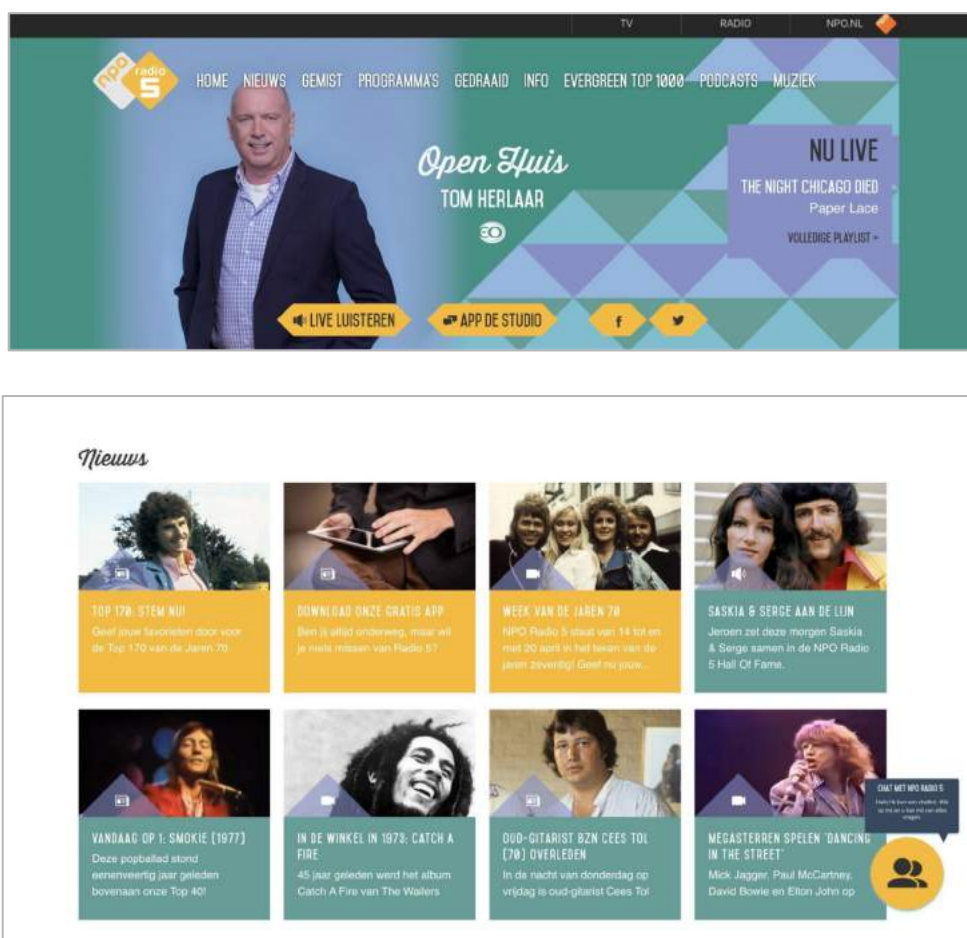
Interacting with any of the alternative chatbot access methods described above always led to a chat widget being visualized. Two alternative options were tested here: either first a short introduction screen was shown where the chatbot would present itself (see Figure 12, Figure 13, and Figure 16), or the user was directly taken to the screen where he/she could immediately start chatting (see Figure 11 and Figure 14). Please note that in the latter case the chat screen also included a short welcome message, encoded in the form of a chat message being sent from the chatbot to the user.



Regarding the actual chat window, again two different mock-ups were developed. In the first variant, the chat widget would show a rather generic welcome message (stating, basically, that users could ask the chatbot anything, ranging from the currently playing song to the program schedule of the radio station), see Figure 11 and Figure 12. In this version, users needed to pose their questions via free-form text input. The second variant (see Figure 14) utilized a different welcome message (“How can I help you”) and offered the user the choice between four predefined chat topics (“program schedule”, “on air now”, “get in touch”, and “give feedback”). In this mock-up instantiation, users could start a conversation with the chatbot either by selecting one of the predefined topics or by inputting free-form text. As an example, with just 3 clicks, users in this instantiation could get more information on the programs on air in the midday (depicted in Figure 14).

The phase 2 mock-up also covered the option to give feedback on the chatbot functionality (see Figure 14, first image). Users could either simply click on ‘Yes’ or ‘No’ when the bot asked ‘Are you satisfied with the answers I provided you with’, or they could exploit free-form text input to provide more detailed feedback.

Finally, the phase 2 mock-up included a registration option. The idea here is that registration (Figure 15) would allow the chatbot to give listeners a warmer welcome or provide them with personalized news updates regarding their artist(s) of choice during future visits to the NPO Radio 5 website.



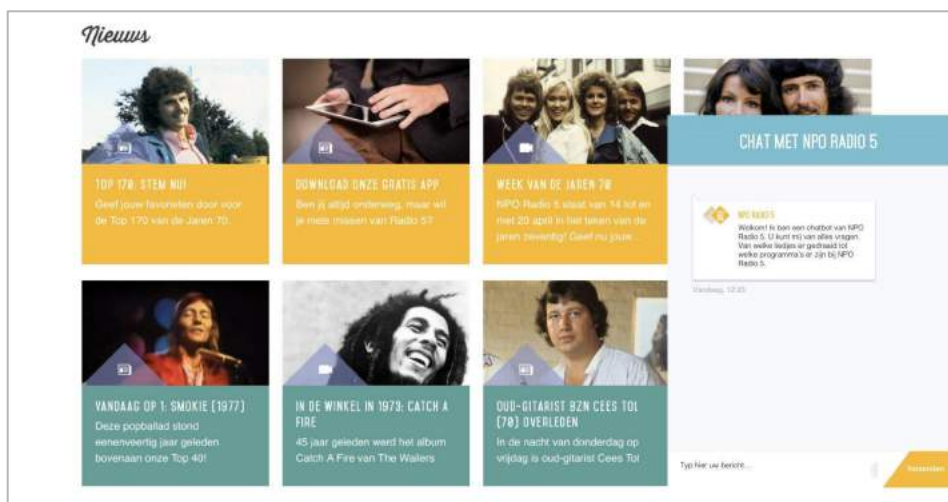


Figure 11. Overview of possible layout positions for fitting the chatbot functionality into the NPO Radio 5 website, here depicted right by the mustard yellow circle button. By clicking the button the chat screen would pop-up.

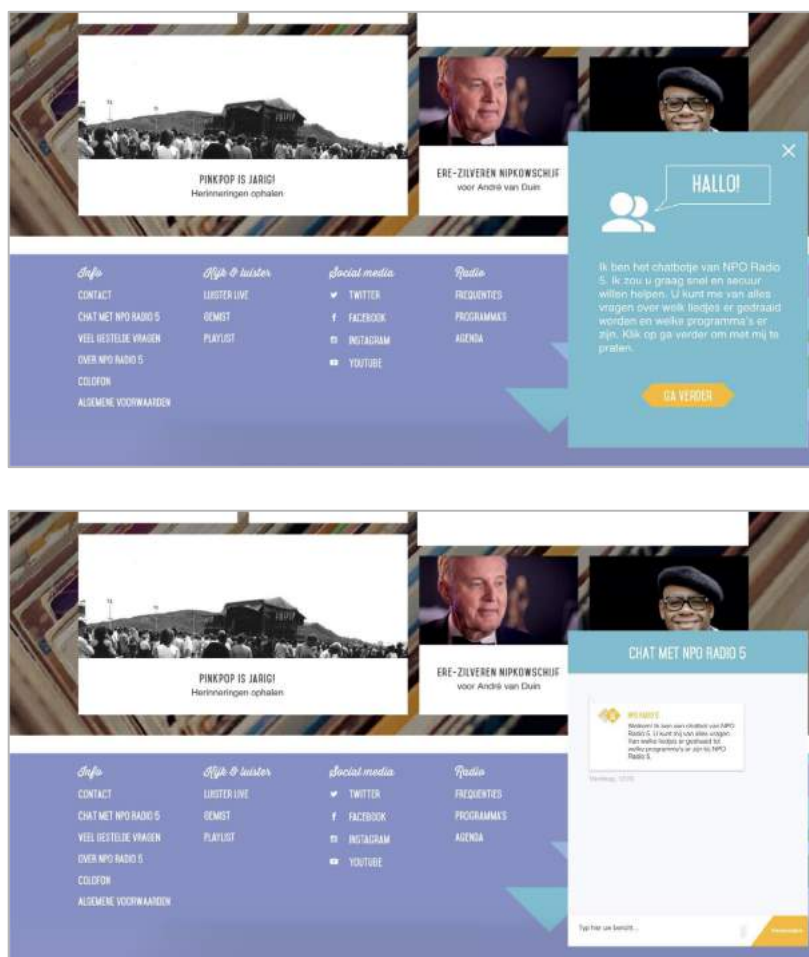


Figure 12. Overview of possible layout positions for fitting the chatbot functionality into the NPO Radio 5 website, here depicted in the footer by clicking 'chat met NPO Radio 5.'

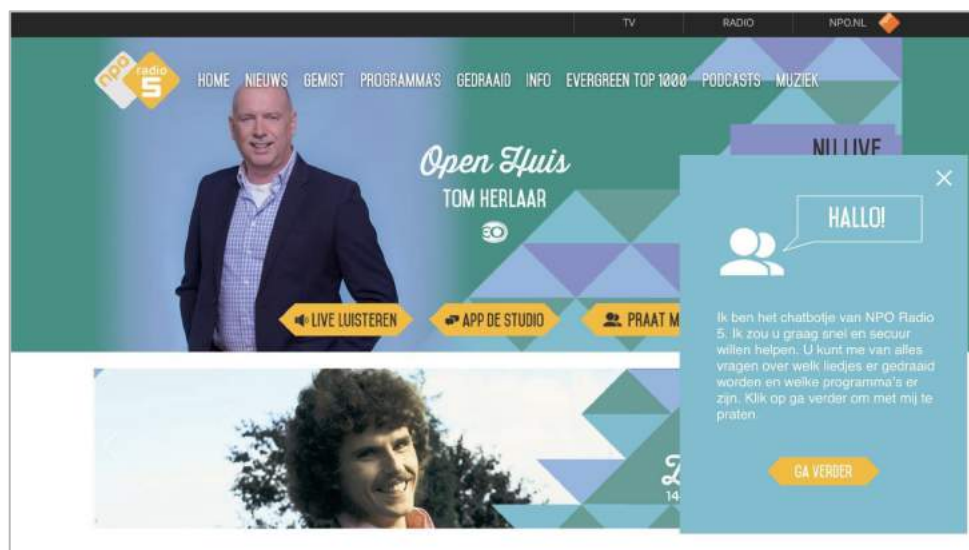


Figure 13. Overview of possible layout positions for fitting the chatbot functionality into the NPO Radio 5 website, here depicted in the menu button 'praat mee.'

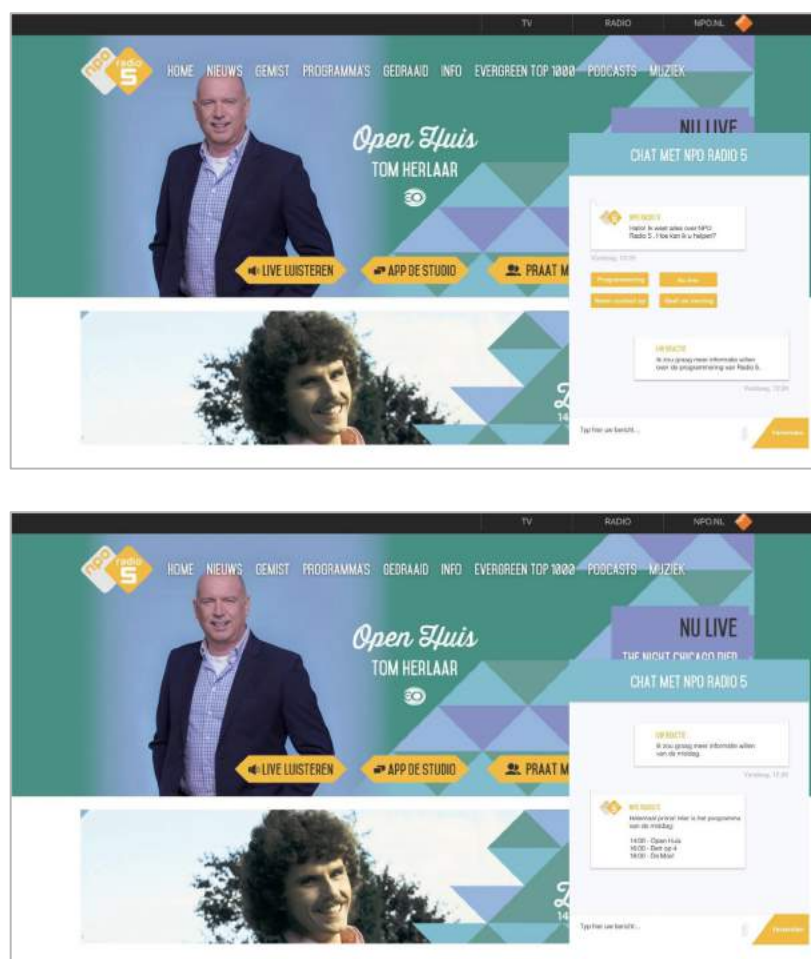


Figure 14. Example of pre-defined routes in chat.

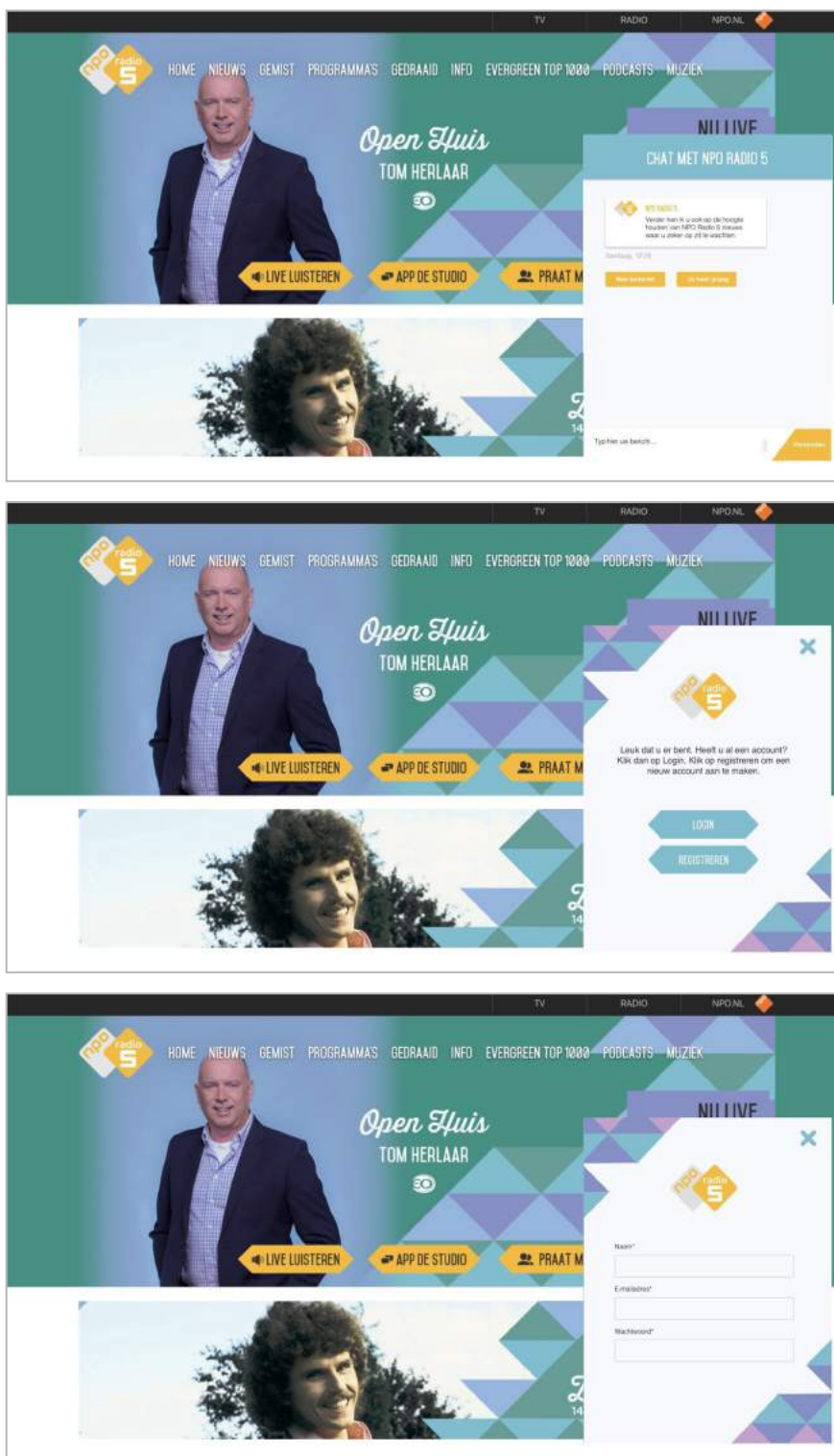


Figure 15. Design of the login and register feature.



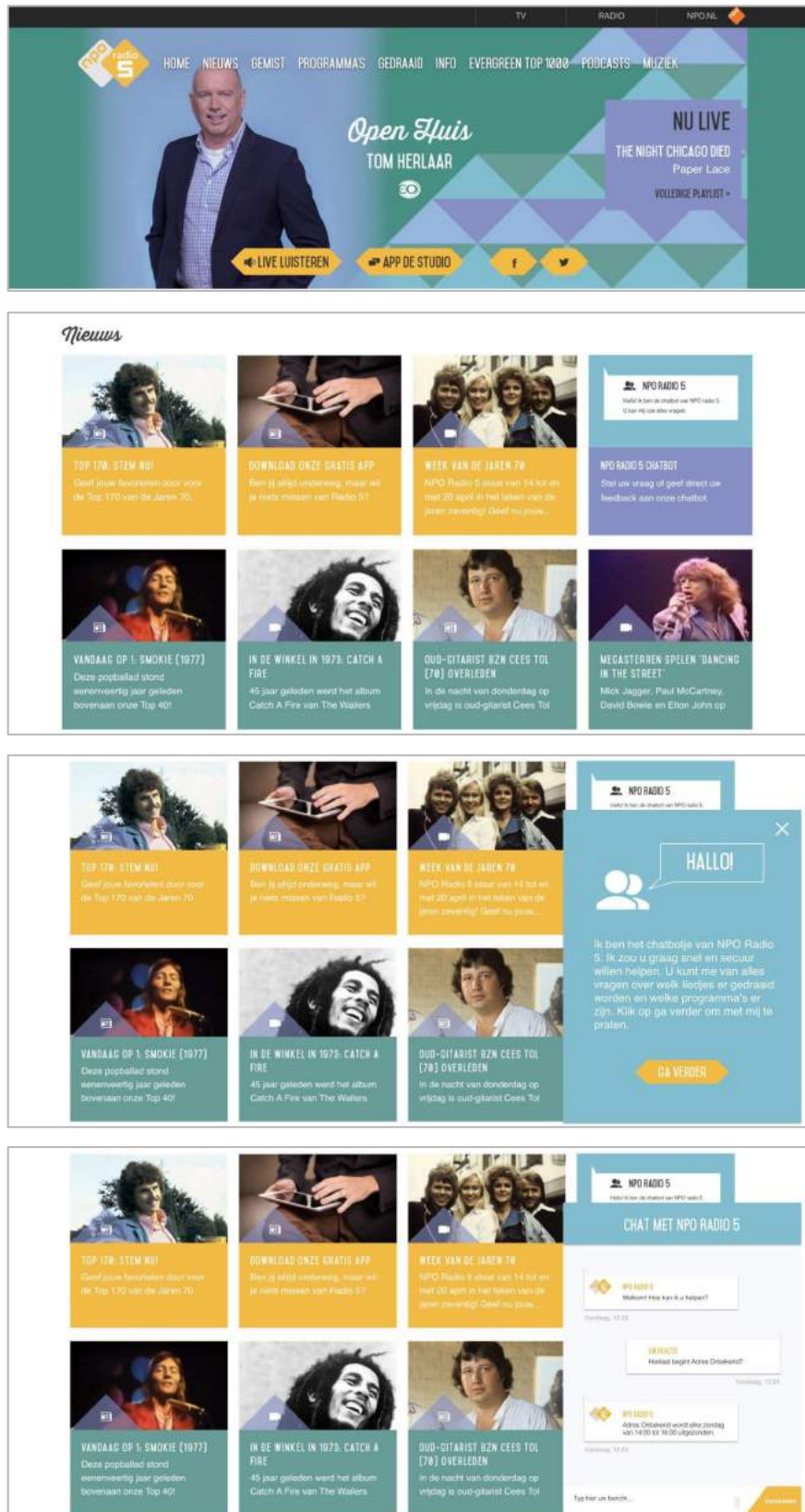


Figure 16. Example of the “click to chat” option displayed in the News section.

### 3.3.3 Phase 3

As a third iteration, a chatbot mock-up was developed for the smartphone app of NPO Radio 1 (a news focused radio station that often asks listeners for input). This mock-up was specifically intended to experiment with conversation focusing via the display of predefined chat topics which correspond to news subjects that will be discussed by NPO Radio 1.

This mock-up included a “live display” of the current radio show where the user could see which topics will be addressed by the show and when (see Figure 17, left and center). The chat interface then included predefined conversation options, one for each of the current radio show’s discussion topics (see center of Figure 17), to make it easier for listeners to participate in the radio show and to contribute input to it.

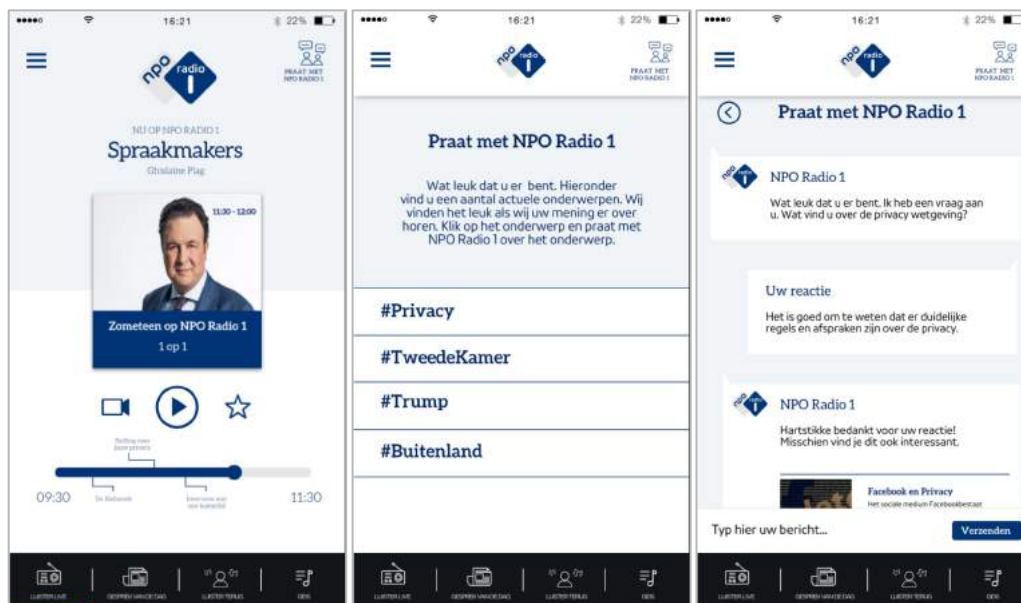


Figure 17. Example of the topic focused chat flow.

## 3.4 Mock-Up Evaluation

The sections below present the evaluation of the different instantiations of the Audio on Demand and chatbot mock-ups.

### 3.4.1 Audio on Demand

#### 3.4.1.1 AUDIO ON DEMAND VERSUS LINEAR

Recall that our goal with the “Audio on Demand” mock-up was to get insights in: (1) *how we can learn more about the listeners and persuade them to listen to more content?* and (2) *how we can make their audio experience more personal?* For this mock-up, the unified evaluation methodology discussed in [Section 2.2.2](#) was not applied. Instead, the customer journeys that were supported by the mock-up were evaluated by 5 users on the last day of the Google design sprint (see [Section 3.2.1](#)). Details of the participants are presented in Table 6.

Table 6. Overview of participants for the Google design sprint evaluation – Audio on Demand.

Participant	Job	Age
001.F	Office manager	45
002.M	Operations Manager	42
003.F	Waitress	20
004.F	Penalist	49
005.M	Editor	31

## Findings

The main evaluation finding was that the concept of personalized audio seems to have potential among listeners. Other important lessons learned were:

- The combination of live radio and on demand radio was insufficiently clear to test users.
- Test users did not see the need for a combined live / on demand radio solution.
- Being able to create a personal playlist was deemed a nice feature by test users, as long as this task was easy to achieve.
- The combination of news/relevant content on demand and live music offers more value.

### 3.4.1.2 AUDIO ON DEMAND TO GO

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### 3.4.1.3 NEXT STEPS: AUDIO TO GO PILOT APP

Inspired by the promising preliminary evaluation results, a new and bigger pilot for the “Audio to Go” functionality is currently being organized. This pilot aims to investigate both organizational and listener-related aspects:

#### Organization:

- Is there enough content available to fuel an app that will give listeners 30 minutes worth of news content daily, or is new content (like podcasts) needed?
- How many editors would be needed to make this content ready for use in the app (audio editing and data entry)?

#### Listeners:

- What are the most popular subjects users choose for personalization (latest news, culture, science etc.)?
- What is the average amount of time users want to spend on listening to a personalized audio stream?
- What percentage of users will use the app daily/weekly/monthly?

The envisioned functional prototype will be distributed to 1.000 users and their app-behavior will be monitored during 4-6 weeks. The end goal is to accumulate sufficient (quantitative) insights to launch a personalized audio app for NPO in 2019.

The target audience will primarily be the younger end of the spectrum of the listeners of our news channel NPO Radio 1 (i.e. 35-55 age range), who own a smartphone and are already registered users

of the NPO radio app. We want to find out if this user category will be tempted to switch to our personal audio app instead of resorting to other news channels (e.g. podcasts or commercial broadcasters) and whether this will increase the amount of time spent listening to NPO content.

The results of this extended, in-the-wild pilot will be reported in future deliverable D4.2.

### 3.4.2 Chatbot as a Service for the Listener

#### 3.4.2.1 PHASE 1

The objectives of this preliminary evaluation were as follows:

- Investigate whether listeners know what to expect when they see a button to ‘contact the studio’.
- Assess whether users are willing to create an account in order to gain access to the chat functionality.
- Explore users’ expectations with respect to a chatbot for radio.
- Explore users’ interest in using chat functionality.

The phase 1 mock-up was assessed using the *early feedback sessions* component of the unified evaluation methodology (see [Section 2.2.2.1](#)). The evaluation participant list, including some basic demographic information, is to be found in Table 7. All these users evaluated the mock-up individually.

Table 7. Overview of participants: evaluation of the chatbot mock-up (Phase 1).

Participant	Job	Age
001.F	Digital Coordinator	33
002.F	Intern Corporate Communications	22
003.M	Media Manager	54
004.M	Product Coordinator	34
005.F	Communication Manager	40

#### 1 | Introduction to concept

We started the evaluation by introducing ourselves and the MARCONI concept. We then collected general information about the participant and specifically inquired about his/her radio habits. These inquiries yielded the following information (cross-participant):

- Mentioned stations: NPO FunX, NPO Radio 1, NPO 3FM, BNR, Radio 10, Skyradio, Radio 538, SLAM!, Q-music, SublimeFM.
- Listening time: in car, during travel to and from work.
- Listening habits: switchers, depending on time of day and mood.
- Ways of listening: via (digital/car)radio and apps like Tune-in and Spotify.

#### 2 | Introduction to mock-up

We showed our listeners the mock-up (Figure 10), walking them through every screen except the ‘Contact the studio’ button (leftmost in Figure 10). We first asked our interviewees what they expect would happen when pressing this button (without showing the other screens yet). This yielded diverse answers. Some users were expecting the button to link to a customer service or help desk-like

experience. However, most people did expect to connect with the radio studio or DJ. The feedback we received was that the button should be bigger to be more easily actionable (“I wish” feedback).

After collecting users’ expectations with respect to the meaning of the ‘Contact the studio’ button, we then continued to show the complete mock-up by also discussing the chat-related screens.

### 3.1 | Introduction to chatbots

As participants mentioned ‘helpdesk’ or ‘customer service’ in the previous step of the evaluation, we then asked if they had ever used (online) chat function to collect information. We also inquired about their familiarity with and opinion about the concept of chatbots or digital assistants. This yielded the following qualitative information (cross-participant):

- Experience with chatbot platforms: e-commerce environment (AliExpress), insurance companies, banks (ING, Rabobank).
- Chatbot usage: three out of five participants had interacted with a chatbot, but to a rather limited extent. The other two participants preferred to resort to a telephone call or accumulate necessary information in another way (e.g. by doing research on their own).
- Chat expectations: chat as a service (to help a customer faster and better) or live chat with editorial team.

The overall feeling among interviewees was that a chatbot would work fine for specific types of questions. On the other hand, when thinking about radio stations and providing listener input to a radio program, some of the participants specified that they would feel better talking to a person (instead of to a chatbot).

Two participants showed exceptional interest in a chatbot for broadcast radio. They felt that it would help them to interact more easily with the program (i.e. to submit a reaction to a program item, to provide input for a panel discussion, to give feedback or to participate in a contest). Two participants were more hesitant; these users declared that it would help if it would be clearer what the added value of adopting chatbot functionality would be for them.

### 3.2 | Chatbots for a specific program or radio overall

The overall feeling was that the chatbot should be made accessible for the entire broadcaster, so not targeted to a specific show. Furthermore, participants agreed that the chatbot should be 24/7 accessible.

### 3.3 | Chatbot usage for radio

We then asked for which purposes the listeners would interact with the radio stations via a chatbot. The answers were in feedback and participation direction:

- Feedback: give a shout out.
- Participate: ask questions, talk with program maker, and get to know more about what’s playing now.

Given the above answers, we asked which platform should be used best for chatbot integration. The answers were divers; participant age turned out to be a deciding factor here:

- 20-35 age range: preferred FB messenger (mobile first);
- 35-55 age range: preferred in-app or on site.

### 4.1 | Account creation: immediate login

Imposing the requirement of signing in before being granted access to chatbot functionality was ill received by participants. The one test participant below the age of 30 was most willing to register if there was a social login option (e.g. Facebook, Spotify). The four other participants explained that they





would click away/leave the chat. These users declared that they understood the need to leave a name (feeling of personalization). On the other hand, creating a login upfront felt like a step too far for these users; they wanted to try out the chatbot service first before deciding to register.

The overall conclusion (4/5 participants) was that it would be better to grant users immediate access to the chat and then to exploit the chat to muster user information. That way, users can try out the chat service and decide what's in it for them. If the service would be appreciated by the user, he/she could then decide to create an account to benefit from personalized chat responses tailored to the user's profile information. Note that our listeners felt that they were most willing to chat with a radio station they felt connected to.

#### 4.2 | Account creation: personalization

We asked respondents if they were willing to create an account and to set personal preferences. Most listeners felt that radio helped them break out of their bubble. So the broadness was appreciated and preferences will narrow their world. A reason to be more personal was to be able to get e.g. relevant news faster than others, or be able to be the first to get relevant music/concert updates/festival news (again: what's in it for them).

The second question was what kind of preferences would people want. To help the chatbot to achieve more personal interactions with individual listeners, the choice of conversation topics should be station specific. For listeners of news-driven radio broadcasts, topics like culture, education, programs, podcasts etc. are likely to be the most interesting conversation items. On the other hand, listeners of music-driven radio shows will mostly focus their interactions on artists, festivals and music genres.

#### 4.3 | Account creation: anonymous

When being confronted with a chatbot service, almost all test participants expected the initial communication to be anonymous. Like said before, our user panel typically wanted to test the chatbot functionality first to get an idea of 'what's in it for them' (e.g. win concert tickets, get discount). If the initial chatbot experience would be rated positively, test users indicated that they could likely be persuaded to create a login. Stated differently, the upsell (i.e. registering an account) should come later in the process.

That being said, our test panel understood the need for providing personal details in order to make the chatbot interaction more tailored to their profile. The interviewees also felt that they only wanted to login to those radio stations they're a fan of.

### 5 | Interaction

When asked what sort of questions participants were most likely to submit to the chatbot, the responses could be broadly divided into two categories:

- To participate and engage with the radio station (e.g. give feedback, share opinion on topic);
- To get information (e.g. what song is currently playing?).

Four out of five test users specified that they would be willing to provide feedback to the radio station if this could be done in an easy manner. In this context, users mentioned the use of a simple thumbs up or thumbs down, or a rating scale. At the same time, most users also preferred to have the option to provide elaborate feedback (i.e. via unconstrained text input) in case necessary.

#### 6.1 | More than just chats?

Our interviewees found it hard to think of chatbot functionalities other than plain textual communication but mentioned a few. Our test participants felt that first the chatting process should work perfectly. In this context, they also mentioned the necessity of being given the option to talk to



a real person. Chatbots should be the first line responders; if listeners' questions/remarks are not met with satisfying answers, 'real people' should still be involved in the communication process.

Other identified functionalities:

- Sharing of images/screenshots (same functionalities as WhatsApp);
- Use of voice should be possible;
- Polls.

## 6.2 | More than just interaction?

Our test users mentioned that, if the 'what's in it for us' part would be clear, a decently working chatbot could foster the listener's feeling of connectedness with the radio/program/DJ and would hold opportunities for increased listener engagement. Respondents also indicated that they would like to know how their reactions/responses/feedback is being processed by the radio station (e.g. integration in a radio show). In this context, it was explained that interacting with the radio station (sharing information, providing feedback, ...) requires time and effort; test participants felt that the least the radio station could do in return, is to inform them about what happened with their input.

### 3.4.2.2 PHASE 2

The primary questions we aimed to address with the second iteration of the chatbot mock-up were the following:

- What is the best way to present the chatbot on the NPO Radio 5 website? Where in the website should the chatbot be inserted?
- Are people more interested in a direct chat possibility or do they prefer a more guided dialogue?
- Are people willing to create an account after having experienced a satisfying conversation with the chatbot or after they got a suitable answer from the chatbot? (compare this with the requirement to create an account upfront, which is what we tested in the first chatbot mock-up)
- What kind of preferences they would prefer to get more personalized services? (how would they like to make a selection? i.e. based on topics or based on music genre, artists etc.)

The Phase 2 mock-up was assessed using some components of the *formative user evaluation* described in the unified evaluation methodology (see [Section 2.2.2.2](#)). The evaluation participant list, including some basic demographic information, is to be found in Table 8. All these users evaluated the mock-up individually.

Table 8. Overview of participants: evaluation of the chatbot mock-up (Phase 2)

Participant	Job	Age
001.F	Head of Webcare	30
002.F	Marketing Coordinator	45
003.M	Employer Purchase department	55
004.F	Digital Coordinator	35
005.M	Spokesman	47

## 1 | Introduction

We again started the evaluation by introducing ourselves and the MARCONI concept. We then explained the purpose of the mock-up and showed our test users how to scroll through the digital mock-up. Next, users were asked to browse the mock-up and find ways to get in contact with the radio station. Some users (2 out of 5) only looked at the navigation items in the top and gave 'info' as answer (see e.g. Figure 11, at the top, 'HOME, NIEUWS, GEMIST, PROGRAMMA'S, GEDRAID, **INFO**, EVERGREEN TOP 1000, PODCASTS, MUZIEK'). After inquiring about other contact possibilities in the website, these users came up with the chat icon in the right corner at the bottom of the page. Other people mentioned this icon directly as obvious means to contact the radio station.

## 2 | Chatbot accessibility

Most people favored the chat icon at the bottom of the page as method to access the chatbot. These users said the bottom-right positioning felt natural (i.e. it is a place where you expect a chat option to occur) and also that most websites offer it there. Users expressed the desire to have the chat icon 'scroll along the page' so that it is directly visible (instead of having to scroll to the bottom of the page).

Integrating the chatbot access interface as a content block in the website's news feed (see Figure 16) failed to attract people's attention, because it felt and looked too much like 'content'. An option to access the chatbot in the webpage footer (see Figure 12) was found to be acceptable, but only if it was complementary to the use of a chat icon at the bottom of the page.

## 3 | Visual appearance of the chatbot access widget

The 'praat mee' button (which can be translated to "talk along" in English, depicted in Figure 13) turned out to be insufficiently clear; participants expected it to grant access to a forum, group chat or discussion group. The icon at the bottom of the page on the other hand was for most people very clear. When seeing this icon, 4 participants expected the presence of interactive conversation options, where they would get instant feedback. Regarding the 'app the studio' button, our test panel expected it would rather lead to one-way instead of full-duplex communication (i.e. you send a message to the radio station but you are not sure if and when you will get an answer).

## 4 | Introduction screen versus direct chat

Most people liked the introduction screen (see Figure 12, Figure 13, and Figure 16), because it helped them to infer what to expect from the chat service. The introduction screen also made it clearly to these test participants that they would be communicating with a computer instead of a human being. Other test participants stated that, although they did not find the introduction screen annoying, they didn't need it to be present.

## 5 | Guided dialogue versus direct chat

Recall that we tested two communication strategies: either typing questions straightaway (Figure 11 and Figure 12), or following a predefined communication route (as shown in Figure 14) via the selection of topics (in this case: "program schedule", "on air now", "get in touch", "give feedback"). Most people preferred the direct input option, because they typically already have a specific question or opinion in mind at the time they decide to contact a radio station. Envisioned questions by test participants were 'what was the name of the previous song', 'when is the week of the '80s' or 'give me information about a certain artist'.

The topic options we offered in the guided dialogue approach were deemed too obvious by test users; in their opinion, information pertaining to program schedules or song playlists is easily findable on the website already. Users strongly felt that predefined communication topics should always be complemented with an option to type custom messages.



## 6 | Willingness to create an account

We asked our test users if they would be willing to create an account if the chatbot would have served them well. Some users did not want to create an account at all (indicating that they already have to manage too many accounts, or that they do not want to provide personal information). Other test participants were only willing to create an account if it was absolutely clear beforehand what extra value they would gain from registering. This finding is consistent with the evaluation results of the Phase 1 chatbot mock-up. When asked what the value proposition of account registration should ideally be, most people mentioned either increased personalization of the communication or the automatic delivery of updates, tailored to their interests.

## 7 | Preferences

When creating an account it is possible to save personal preferences so the chatbot can service people better. Most of the users made a distinction in what kind of preferences would be interesting, depending on the kind of radio station. For NPO Radio 2 and 3FM it should be based on music genres or programs, for NPO Radio 1 it should be based on topics (actual news, background, culture, sports etc.). Nobody mentioned DJ's or presenters.

## 8 | User experience

One of the most important things people mentioned during the mock-up evaluation was that the quality of chatbot-mediated conversations should be sufficiently high. Most participants mentioned that they would be very annoyed if the chatbot would not understand their question or would give an incorrect answer, which in turn would incite them to stop using the service.

When asked what additional features could be integrated to make the chatbot functionality more attractive, users mentioned the use of polls and notifications.

Finally, all users found the chat interface very user friendly, clear and easy in use. They also said the tested chatbot service would connect them more to the radio station, provide more engagement and that it would enrich their listener experience.

### 3.4.2.3 PHASE 3

This evaluation focused on answering the question whether the approach of statically typing chat options to the discussion topics of the current radio show would entice people to interact more with NPO Radio 1. The evaluation methodology for this mock-up was quite informal: test participants were asked to fill in an open questionnaire, consisting of 10 questions. Five participants (all male) participated in our study. All these users evaluated the mock-up individually.

### Findings

The visualization of static chat topics based on the discussion items of the radio show was received positively by test participants. All participants indicated an increased probability of participating in the discussion. The predefined discussion topics were deemed really helpful and also made participants feel more connected to the radio station. Finally, participants were enthusiastic that they could react to specific topics of their interest.

### 3.4.2.4 NEXT STEPS

To deepen the exploration of chatbot functionality, we are planning to organize two different pilots. For NPO Radio 2, we want to embed a Facebook Messenger chatbot to help answer frequently asked questions automatically. This should reduce the workload of the editorial team and it should service listeners in a better way. This pilot can also help us to test and improve the quality of automatically generated answers along the way.



The second pilot will revolve around the ‘Theater van het Sentiment’ radio show of NPO Radio 5. In this show, listeners can vote for a top 5 of songs twice per weekend. Additionally, listeners are asked to contribute input pertaining to specific topics of interest that happened at certain dates in the past. As an example, on May 20th, the radio show could ask its listeners to share their most spectacular hitchhiking stories because a new hitchhiking law turned into effect on May 20th, 1965.

We plan to integrate poll functionality in the chatbot, which in turn would allow us to collect a listener’s preferences based on his or her poll responses. The resulting user profiles will allow us to notify users when a song or topic of their interest is on air. Suppose, as a simple example, that a listener voted multiple times for The Beatles in the ‘Theater van het Sentiment’ top 5 song list. If then, at some later point in time, NPO Radio 5 would host a special week about The Beatles, we could inform this listener about this event via a push notification, which in turn could contribute positively to the listener’s engagement with the radio station.

## 3.5 Conclusion

### Audio on Demand

We got useful learnings from the different mock-up evaluations. One of the main outcomes of the first sprint was that the concept of personalized audio seems to have potential among listeners. An important learning of the second, more elaborated mock-up, was that the concept was self-explanatory. Always starting with the most recent news bulletin, accounting for items from programs to which people normally wouldn’t listen, and adding local news were all well appreciated.

The two evaluations gave us enough confidence to continue with the Audio to Go concept and create a bigger pilot as a next step. A new prototype will be distributed to 1000 users and their app behavior will be monitored during 4-6 weeks. The objective of this pilot is to collect sufficient insights to launch a personalized audio app for NPO in 2019.

### Chatbot as a service for the listener

Main learnings regarding the chatbot concern the quality of the chat. It is really important to sufficiently train the chatbot to guarantee that the answers and feedback given by the bot are of good quality. Furthermore, it must be clear to listeners that the chatbot is a computer-mediated service. It was also found that it will help users to properly frame their expectations if the chatbot is explained in an introduction screen. Regarding chatbot access location, users found the right bottom of the screen to be a logic position. People also preferred to chat directly by typing a message instead of being guided via proposed chat topics.

Regarding account creation, it was established that listeners are more willing to create an account after being well serviced first, instead of creating an account upfront. In both cases though, it is of paramount importance to clearly communicate what value users would gain from registering. Stated differently, creating an account must offer real added value to the listener, and this added value must be clear from the start. The most frequently cited example of added value gained from registering an account was the delivery of personalized information and updates, tuned to the interests of the recipient. The kind of preferences people are willing to specify as part of their profile information (after registering) was found to strongly depend on the kind of radio station.

In the NPO Radio 1 experiment, participants were really enthusiastic that they could react to specific topics of their interest. This mock-up evaluation also revealed that polls and notifications could offer added listener value to a chatbot service.



In general, most sampled users expect that a chatbot could create more engagement and a better listener experience. We will explore the chatbot possibilities, do's and don'ts further with different small pilots in the coming months.

## 4 VRT: Unified Editorial Interface, Smart Bots, and Lively Environment Mock-Ups

### 4.1 Introduction

At VRT, we designed 4 initial mock-ups (see Figure 18):

1. smart and unified editorial interface (scenario 2 of D1.2),
2. smart bot for editorial teams (scenario 1a of D1.2),
3. smart bot for listeners (scenario 1b of D1.2) and,
4. lively environment (scenario 1 of D1.2).

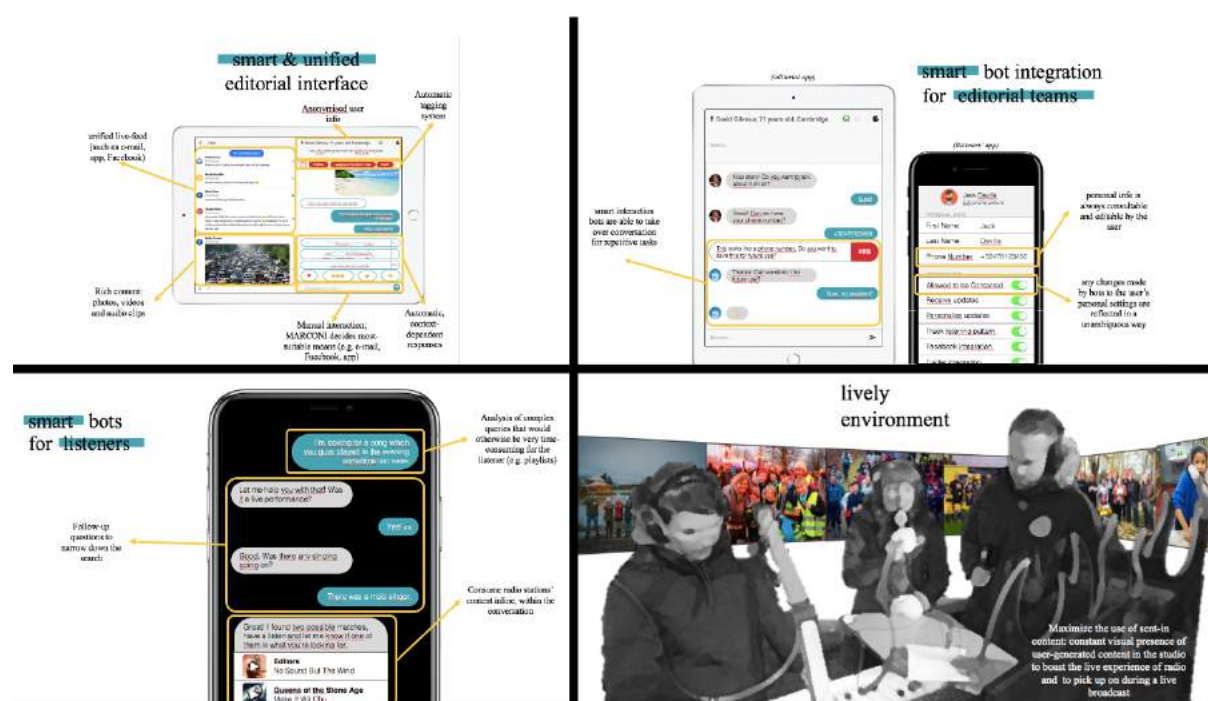


Figure 18. Four initial mock-ups as designed by VRT.

In the following, we will present how we engaged radio makers in a preliminary mock-up prioritization process in order to establish an order for conducting detailed mock-up evaluations. As mock-ups 1, 2 and 4 focus on radio makers, we concentrated our efforts on the needs of this MARCONI stakeholder group.

### 4.2 Preliminary Mock-ups and Informal Feedback

We presented the MARCONI scenarios (as reported in D1.2) to our business stakeholders, including one digital radio strategist and two project managers of online radio (see Figure 19). For this, we followed the same approach as in the intra-consortium mock-up workshop presented in the [Section Intra-Consortium Mock-up Workshop](#). Here, the second scenario, in which radio makers co-create content with listeners, was considered to be most relevant at this moment, as it connects to other applications that are currently being developed at VRT such as a tool for editors to consult how their listeners vote on songs in music lists, or an application that enables automatic annotation of radio

content. Then, we presented them the 4 mock-ups (as shown in Figure 18), and questioned whether the visual translation of the scenario connects to their expectations as raised by the scenarios. We will discuss their comments in the following.



Figure 19. Two participants of the preliminary mock-up evaluation session stand around a poster that presents Scenario 1.

#### 4.2.1 Smart and Unified Editorial Interface

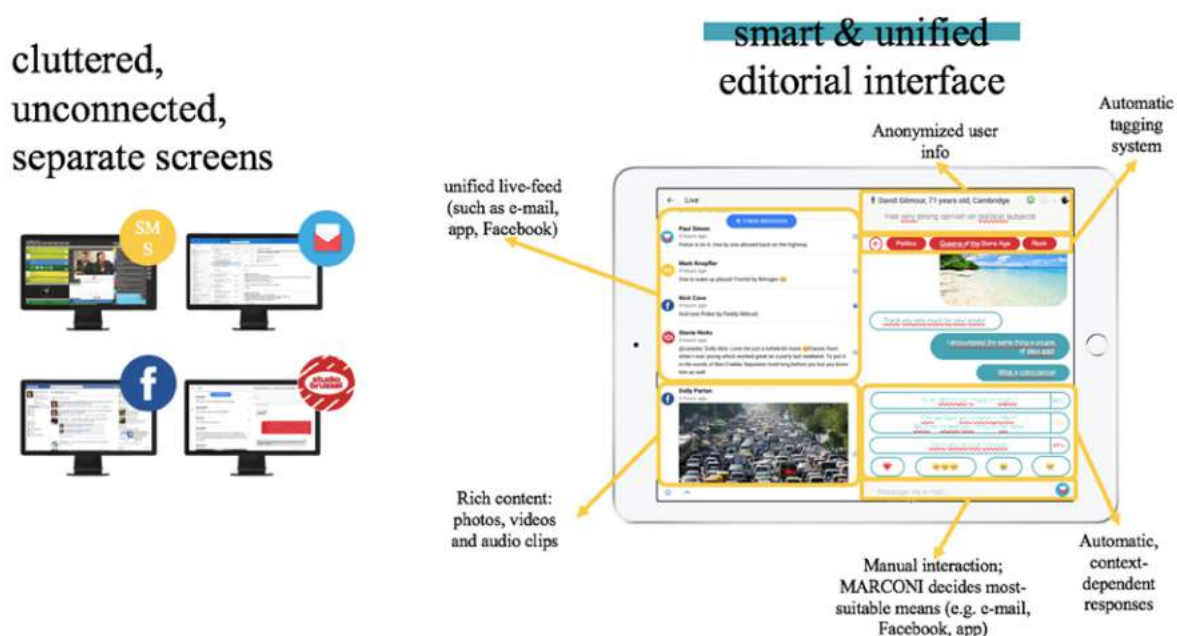


Figure 20. Mock-up and explanation of the smart and unified editorial interface.

The mock-up in Figure 20 explores the unification of different editorial tools in one interface, which connects to scenario 2 of D1.2. The interface shows a window with a live-feed of incoming messages that allows search functions, a window with a selected listener profile, and a window with the possibility to chat with this listener with manually or automatically generated messages. In the profile



window, a function allows to tag listener profiles, e.g. to indicate whether this person is a good speaker or not.

Participants were not immediately convinced, which was mainly due to the title that promises a 'unified' interface. Our participants were hesitant whether the unification of all possible editing tools would be an improvement to radio making. However, we explained this was not the goal of this mock-up as it does not unify every imaginable editing tool, yet only focuses on connecting listener profiles with conversation functions. Still, as this mock-up includes several research challenges (e.g. privacy regulations concerning the tagging of listener profiles), we decided to focus on one particular aspect of the envisioned application: the ability to search in listener conversations (see [Section 4.2.3](#)).

## 4.2.2 Smart Bot Integration for Editorial Teams

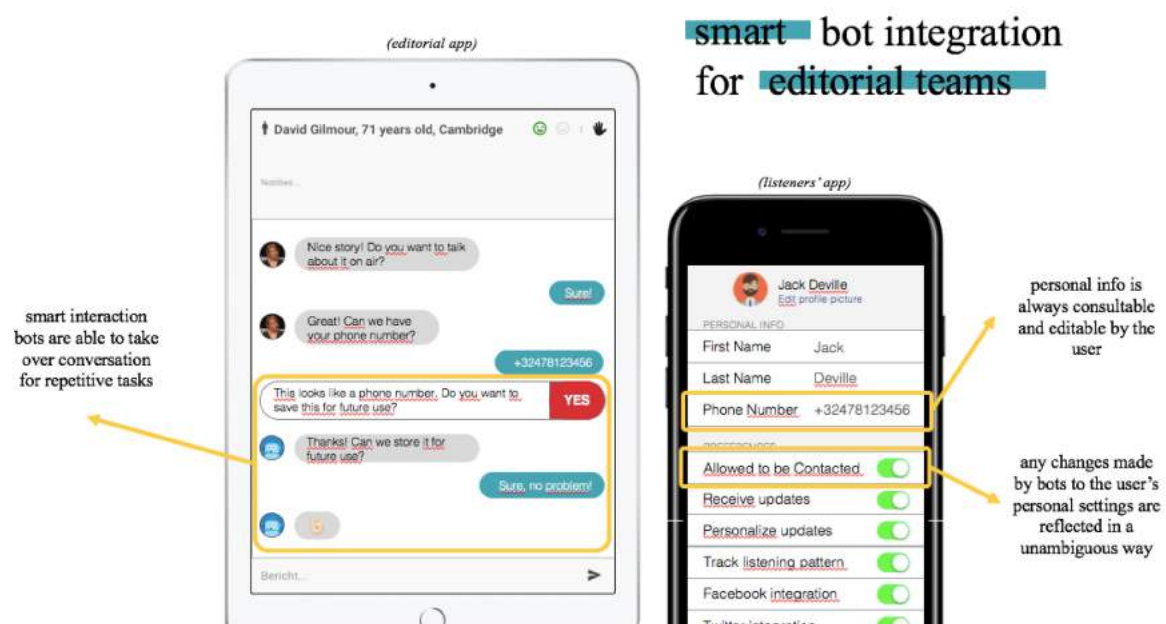


Figure 21. Mock-up of a smart bot integration for editorial teams.

Mock-up 2 (see Figure 21) further explores the idea of automated messages to assist editors in repetitive tasks. For instance, when a listener sends in an interesting story and the editor wants to contact this listener by phone, the editor does not have to ask this explicitly yet can easily look at her settings in her profile. As such, the editor can phone the listener in order to check whether she would be a good speaker on live radio.

Participants were enthusiastic about this feature as it would alleviate the workload of the editorial team. The preliminary mock-up was assessed to be a good starting point, yet participants felt it was still unclear how the access to listener profiles could occur.

### 4.2.3 Smart Bot Integration of Listeners

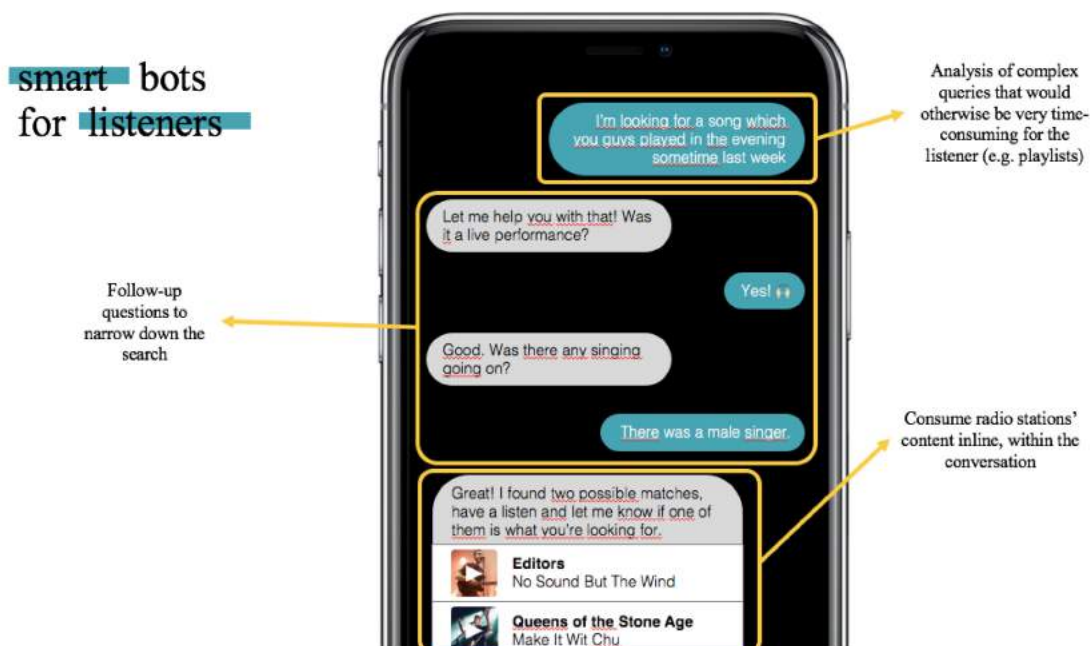


Figure 22. Preliminary mock-up of smart bots for listeners.

The mock-up in Figure 22 presents the view of the listeners in the context of the smart bot application (which was already discussed in [Section 4.2.2](#) from the perspective of editorial teams). It includes making it transparent to listeners whether they are talking to a bot or not. It also demonstrates music search possibilities for listeners, as listeners can reason with the bot which song they are searching for. When the answer is found, the bot can suggest in the application to consume the song immediately.

Participants were also enthusiastic about this preliminary mock-up, no further comments were made.

## 4.2.4 Lively Environment



Figure 23. Conceptual sketch of lively environment.

Lively environment (see Figure 23) is still limited to a conceptual sketch as the actual development and testing of this application is planned in a later stage of the project. However, we already wanted to present this to our participants as a way of showing the next steps in the MARCONI project.

## 4.3 Mock-Up Evaluation

We designed and developed a working search tool for listener interactions, which is part of the unified editorial interface (see Figure 24). We studied the mock-up of this tool in two iterations.

### 4.3.1 First Iteration and Mock-Up Evaluation

The first screen of this mock-up contained a Google-like search bar (on a white interface). When searching for a particular word, results are shown below the search bar. The user can filter based on type of content: text, pictures or video. Users can also search only on pictures. When clicking on one of the results, the text is automatically copied.

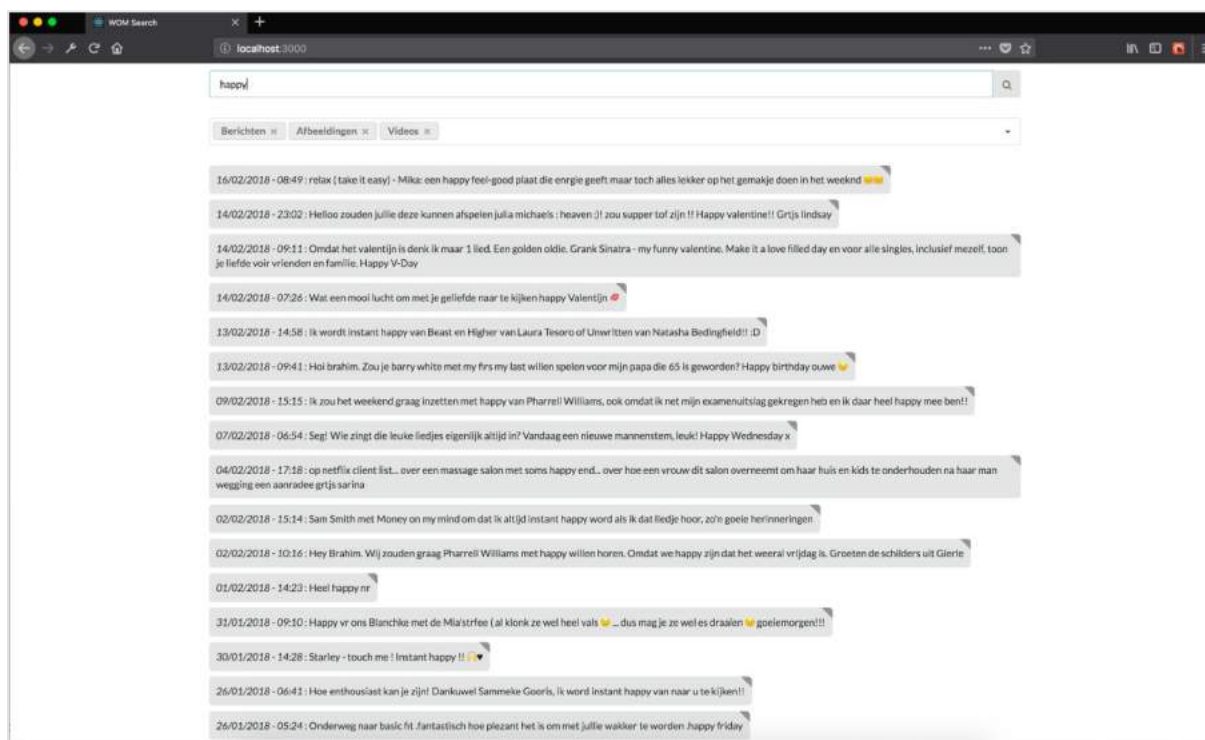


Figure 24. Screenshot of the working mock-up of the search tool for listener conversations, with a search bar on top of the page, and the results below.

The working mock-up was presented by the creative developer to an editor and the digital strategist of VRT's Studio Brussels radio station (see Figure 25). To warm up the conversation, we asked them to think of possible, real-life uses for this prototype. As shown in Figure 26, about 13 uses were collected. Most uses were very practical, such as using it to star messages, to find out date or location of the message, to see whether a message is already answered or not, to add the name of the editor who read and responded to the message, etc. Such uses were not supported by this iteration of the mock-up. The participants also imagined applications in specific radio shows, such as how they would search for a particular listener profile in the context of the 'Zwaarste Lijst', which is a music list of the 66 best heavy metal songs curated by Studio Brussels listeners. This use connects to previous remarks in the preliminary mock-up session (see [Section 4.2](#)). Participants envisioned that, with the help of this working mock-up, editors could search for listeners who voted on AC/DC and ask them to be called when one of the AC/DC songs comes up in the 'Zwaarste Lijst'. Another application could be to organize polls on the national football competition, to quickly find listeners who cheer for a particular team. Other uses deviated from the initial use, such as connecting it to beacons at concerts to personally welcome listeners based on their profile.





Figure 25. Participants in the mock-up evaluation of the first iteration: editor (left), user researcher (second to left), digital strategist (in red) and creative developer (right).



Figure 26. Possible uses as expressed by participants in the first iteration round.

Then, we evaluated the prototype by following the 'I like, I wish, What if' method (see [Section 2.2.2.1](#)). The participants liked the inclusion of pictures and videos in the search results but desired new functionalities (see Figure 27). For instance, they imagined an advanced search filter, which would



include location, date of publication, and media source (e.g. Twitter, text message, Facebook message). The participants asked for checkboxes in order to be able to reply to several messages at once. Keywords should be highlighted, and pictures and videos should be downloadable. They also wondered whether they could search on sentiment.



Figure 27. Participants mostly expressed wishes of future functionalities.

### 4.3.2 Second Iteration and Mock-Up Evaluation

The results of the initial mock-up evaluation were translated in an iterated version of the mock-up (see Figure 28). The mock-up contains 7 slides, which can integrally be found in [Appendix A](#). The first slide presents the same Google-like interface as in the first iteration yet adds 4 filters in dedicated drop-down menus and a word-cloud visualization of trending topics. The second slide shows a search word, highlighted in blue. The third slide shows which filters are selected. The fourth slide shows how search results are presented to the user. The fifth slide displays options that are visible when a message is selected (e.g. delete, mark as unread, and download attachments). The sixth slide is what the user sees when he clicks on a message: the previous conversations with this listener and his/her profile. The last slide presents the options that are visible when a message is selected.



Happy				Q
Content	Date	Tags	Location	
<input checked="" type="checkbox"/> Messages	<input checked="" type="checkbox"/> Good speaker	<input checked="" type="checkbox"/> Flemish Brabant	<a href="#">Remove filters</a>	
Source	Name	Message	Date and time	
<input type="checkbox"/> f	Nicolas De Smet	Relax (take it easy) - Mika: een <b>happy</b> feel-good plaat die energie geeft maar toch alles lekker op het gemakje doen in het weekend ☺☺☺	16/02/2018   08:49	
<input type="checkbox"/> f	Julie Peeters	Helloo zouden jullie deze kunnen afspelen julia michaels: heaven ☺! Zou supper tof zijn !! <b>Happy</b> valentine!! Grtjs lindsay	14/02/2018   23:02	
<input type="checkbox"/> SMS	Lisa Maes	Hoi brahim. Zou je barry white met my first and last willen spelen voor mijn papa die 65 is geworden? <b>Happy</b> birthday ouwe :-)	14/02/2018   9:11	
<input type="checkbox"/> Twitter	Robin Vermeulen	Wat en mooi lucht om met je geliefde naar te kijken <b>happy</b> Valentijn	13/02/2018   14:58	
<input type="checkbox"/> SMS	Simon Dubois	Ik word instant <b>happy</b> van Beast en Higher van Laura Tesoro of Unwritten van Natasha Bedingfield!! :D	09/02/2018   15:15	

Figure 28. One of the slides of the second iteration of the mock-up for searching listener conversations.

We organized a cognitive walkthrough session of the mock-up with two digital profiles of the MNM radio station (see Figure 29). After this walkthrough, we elaborated on each composing screen separately, asking the participants for their feedback. Feedback was collected on a 7 point Likert scale, and through two open-ended questions. This evaluation methodology adhered to the unified approach discussed in [Section 2.2.2.2](#).



Figure 29. Two participants (on the left), creative developer (middle) and innovation manager (right).

Participants formulated questions, concerns and clear recommendations for each slide:

**Slide 1:**

- Word cloud: what happens with spam messages: are they also part of the word cloud? How can we make sure they will not be included?
- Also, participants were critical whether this word cloud would really give them insight in trending topics, as it will mainly be populated based on responses to topics treated on the radio.
- Advanced filters: maybe it would help if the terminology used pre-defined examples, such as text, Brussels, yesterday and “good speaker” instead of generic words such as content, location, date and tags?

**Slide 2:**

- Autocomplete: would it also autocomplete words? And would it also search for words that are written wrong? Or words that have similar meaning, e.g., happy and excited?

**Slide 3:**

- Advanced filters: can they all be opened at once? Can there be another tag on whether a listener is active online or not?

**Slide 4:**

- Filter: can messages be filtered live when adjusting filters?
- Colors: should be replaced with icons to make clear that it refers to unanswered or answered messages.

**Slide 5:**

- Delete function: is this really necessary? Messages were presumed to always be archived, so rather call it archive than delete? Also, the tool should allow to give rights to particular users, an intern should not be able to delete or archive messages.
- The feature to mark a message as read is missing.
- The feature that allowed immediate export to the radio management tool *Pluxbox* was deemed good as it would be used in practice.
- Thumbnails for pictures would be a good addition.
- The feature *Reply to all*: was deemed good.
- Would the results pop-up in a new tab? Participants would prefer not to lose their search results.

**Slide 6:**

- Incorporating different messaging sources in one overview can be very dangerous as it has already been empirically noticed by the participants how listeners do not like the mix of what they say in Facebook versus what they say via text messages.
- Participants liked the fact that the name of the replying editor is included.
- The interests in particular campaigns was deemed a good feature.

**Slide 7:**

- The possibility to download was judged to be a good feature, yet when there are no videos or pictures, this option should be hidden.

In general, these two participants reported this tool to be convenient and clear to work with, as it gave them the feeling of being “a Google for radio production”. They would use it but they warned us it would take time to convince all radio makers to use such a tool as they experienced this “*is always the case with all new software or working routines, also Pluxbox took a long time*”. They also drew parallels



with existing software that allows to analyze social media messages, yet they found these tools cumbersome in use and would prefer this approach, as it is an extension of their existing chatbot tool.

## 4.4 Conclusion

This mock-up evaluations provided us a new perspective on the daily working context of radio makers. Through spontaneous examples of the participants, we learned how they would have deployed this tool in previous occasions. For example, when famous DJ Avicii died, listeners had sent in a lot of messages, but it was hard to keep an overview of these messages. Such examples make the prototype more tangible for the designers and developers.

More concretely, the next steps will be to further iterate upon this search tool and add autocomplete functions to the search bar, providing other relevant search results and the ability to filter messages live.



## 5 Radio Stadtfiler: Radio App and Legal Screens Mock-Ups

### 5.1 Introduction

As a first step in the design process, SFilter created a mock-up to combine a basic mobile radio app with the “Hedwig” chatbot. This chatbot was deployed for a short period of time on the SFilter website, enabling users to ask basic questions. The answers were extracted from a dedicated but limited database.

Our mock-up exploration for D4.1 was inspired by the ideas behind Hedwig and the MARCONI scenarios described in D1.2. We aimed to create a mock-up to represent a mobile app for listeners with an integrated chatbot. This chatbot could extract answers out of the Pluxbox RadioManager database. We were particularly interested in exploring features for enabling listeners to express their interests and to overview the stored data that is associated with their account.

After conducting an early evaluation of this mobile app and chat mock-up with target users, we detected the need of addressing data privacy aspects. We engaged in substantial discussion with domain experts about how legal demands could be fitted into the user-centered design process, keeping the GDPR in mind. Thus, we integrated the legal aspect into our mock-up explorations. More specifically, we focused on the workflow that users must follow to provide legal consent before using MARCONI services via the mobile app (see Figure 30).

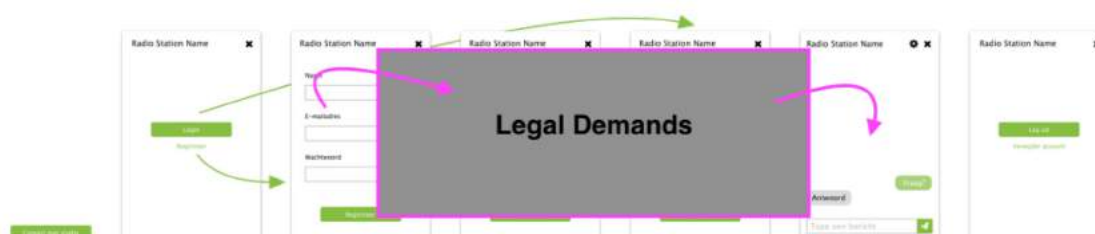


Figure 30. Example of a MARCONI mock-up including a high-level workflow considering legal demands.

In the sections below we detail the iterative process we followed for designing and evaluating the mobile app and chat mock-up, and for addressing data privacy considerations.

## 5.2 Preliminary Mock-Up and its Design Process

### 5.2.1 Exploring the “Radio App” Mock-Up

The starting points of our design process were the outcomes of the listeners and radio-makers workshops (as reported in D1.2), the intra-consortium mock-up workshop (see [Section 2.1](#)), and internal discussions with SFilter board members, radio managers and radio makers. Our mock-up exploration focused on creating a mobile application that is easy to use and is not overloaded with information. We wanted to offer our listeners simple but clever solutions. We focused on the scenarios described in D1.2 which are relevant for this purpose and could be integrated into existing resources.



Figure 31 details the existing resources that we used as inspiration for our mock-up explorations: *Pluxbox Radio Manager* and *Hedwig chatbot*.

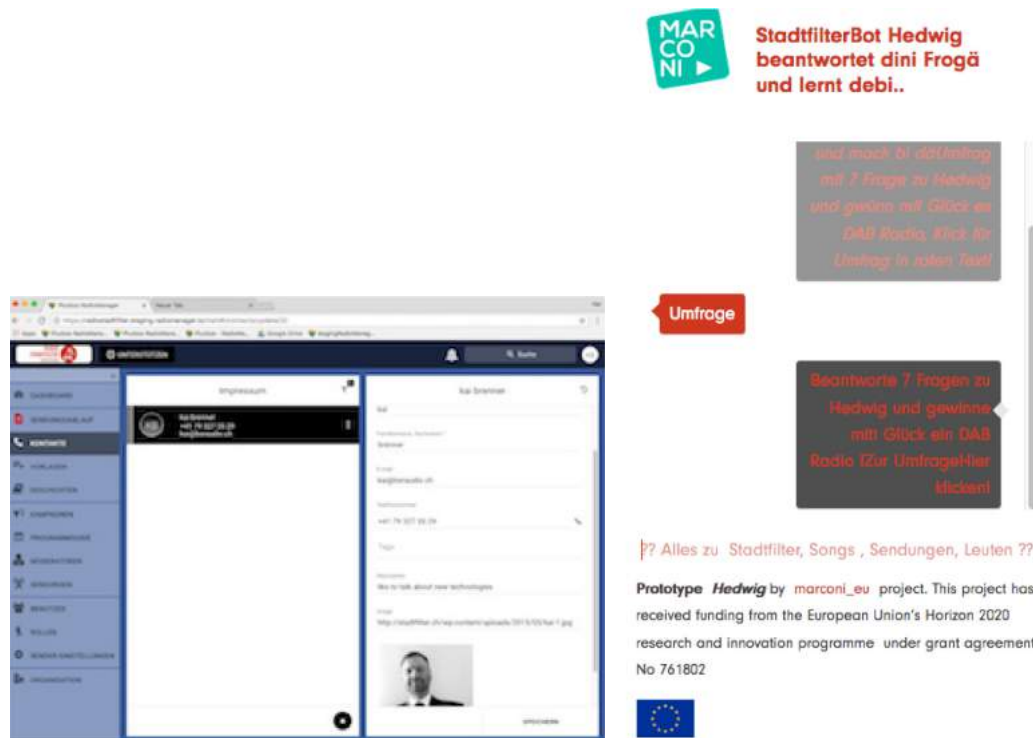


Figure 31. *Pluxbox Radio Manager (Studio)* (left); *Chatbot "Hedwig"* (right).

Figure 32 presents the basic screens for the Radio app mock-up. We propose a simple workflow, where users can log in to the app, select their interests, and access the chatbot service.



Figure 32. *SFilter mobile screens for the Radio app mock-up*.

As we follow a UCD approach, we organized early feedback sessions with relevant domain experts in order to assess our mock-up. For this study, we used a paper version of the mock-up (grayscale print-out) for eliciting feedback more on the functionalities of the mock-up than on its graphic design. Conform to the “early feedback session” methodology described in [Section 2.2.2.1](#), we gathered user

feedback in a structured way using the ‘I like, I wish, What if’ method, followed by an open discussion. Table 9 provides details of the participants involved in this study:

*Table 9. List of participants of the Radio app mock-up evaluation workshop.*

Participant	Occupation and role	Gender	Age
P1	Radio maker	male	35
P2	Radio maker	female	29
P3	Managing director	male	40+

The results of the early feedback session indicated that the simplicity in use and the possibility to directly chat with the studio were the most liked features (i.e. “I like” statements). The “what if” statements showed that also podcasts should be available through the app. The “wish list” of participants, extracted from the “I wish” statements, included:

- A polling tool
- Connecting the app with the guestbook (no login required)
- Post to social media from the app

The following questions came up during the open discussion:

- Do we really need a “log in” instead of an open guestbook or chatbot?
- Personal data about end users should be collected and processed in a safe, legal and transparent manner. What does that mean for in terms of usability?
- Why are legal considerations not integrated in this mock-up?

The input gathered from users, especially that concerning legal considerations, was used as the basis for framing our next mock-up exploration, which is described in the section below.

### 5.2.2 Enabling MARCONI Services with the “Legal Screens” Mock-Up

As a next step in our UCD process, we designed and evaluated a mock-up which covers the GDPR legal aspects, and its implications for the user experience of the MARCONI services. The envisioned workflow, shown in Figure 33, considers that users have to register to our mobile app and have to explicitly consent with a service involving data processing, like a chat. The design problems that we wanted to explore with this mock-up were the following:

- Is there a user friendly way to register and enable a service on a mobile app, presenting users with legal text that is complete, but also brief and easily readable?
- How many steps and “readable” screens will users need to review in order to access a simple service like a chatbot?
- What would be a good way to present legal information?

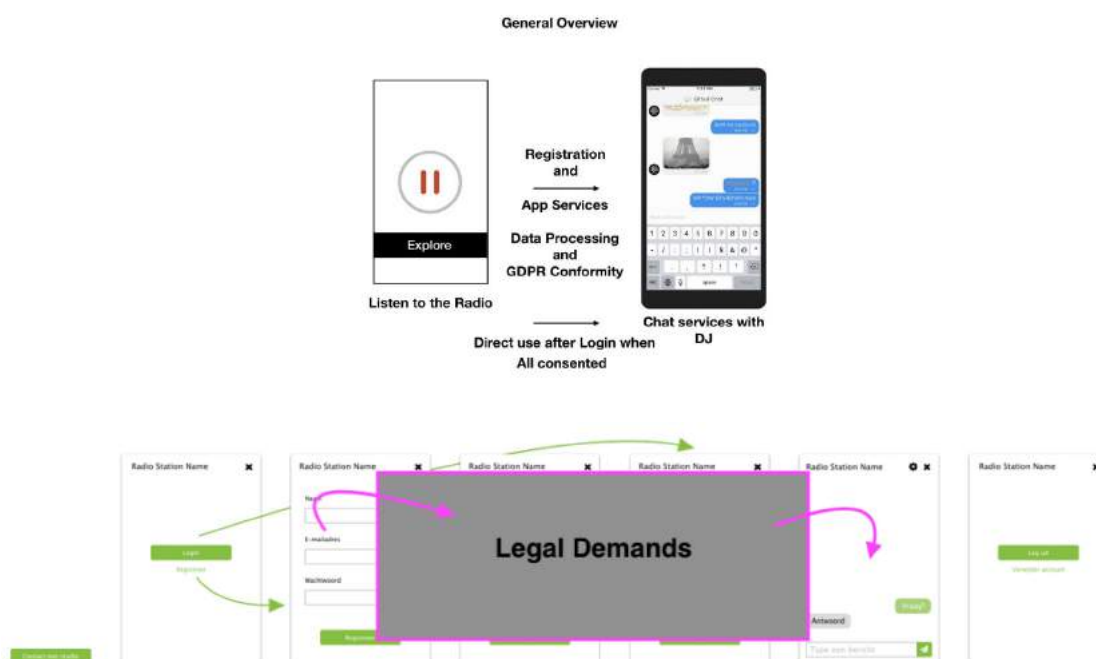
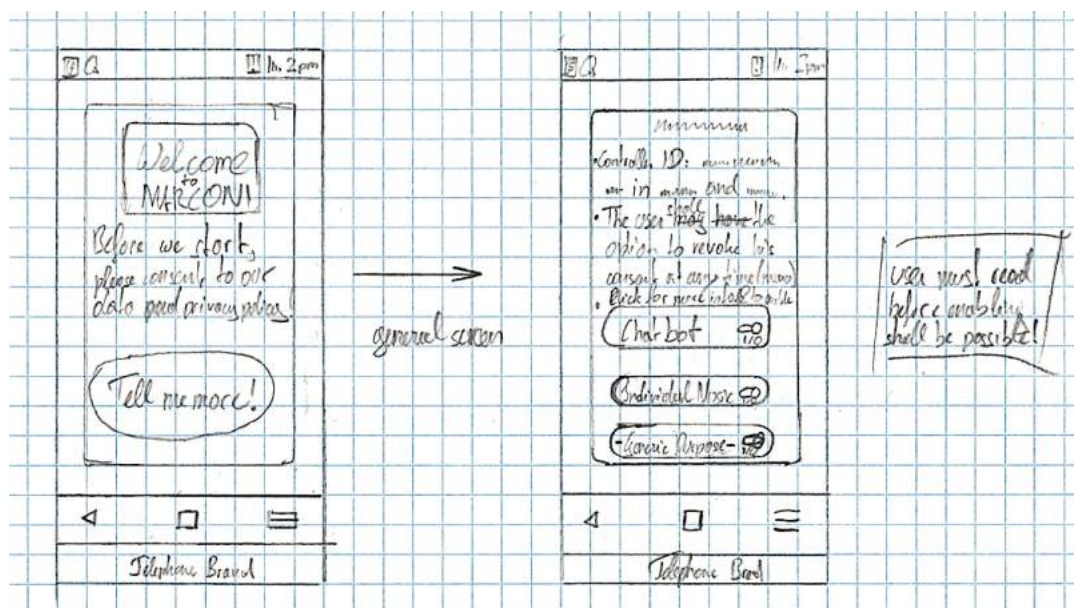


Figure 33. Workflow for exploring legal demands in our mock-up.

We collaborated closely with MARCONI partner University of Vienna to ensure the correctness of the legal information and requirements included in our mock-up. UNIVIE created sketches with a basic structure for the screens, as well as prototypical drafts of legal texts. These texts covered most of the actual services and data processing involved. In particular, UNIVIE shared a global *privacy statement* and a *declaration of consent* describing the used services and the personal data processing they encompass (see [Appendix B, Sections 1 and 2](#)); these gave us a solid basis for designing the mock-up. Figure 34 presents the UNIVIE sketch of user consent acquisition to enabling a service like a chat/chatbot.





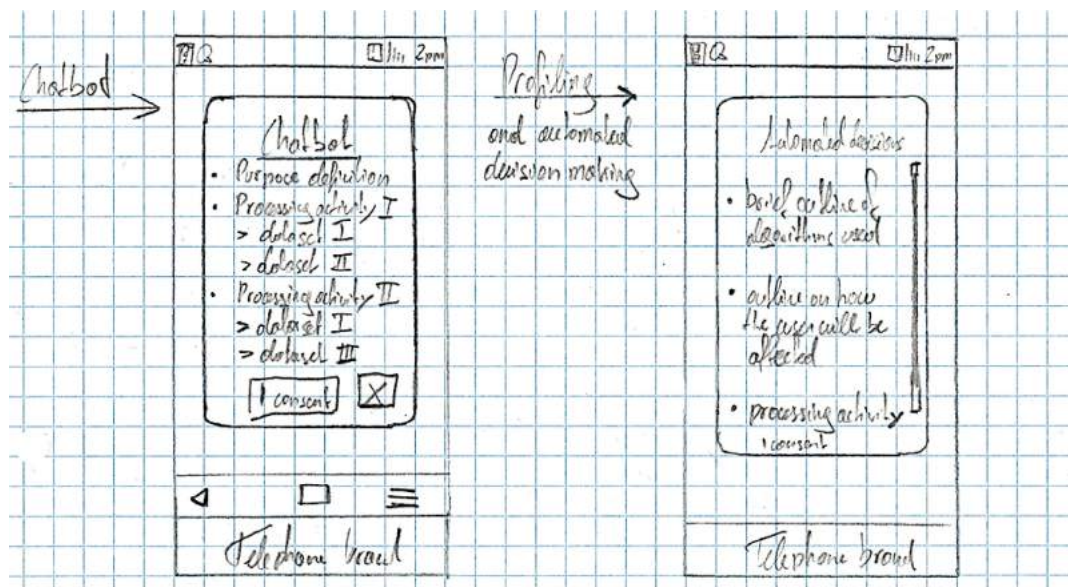


Figure 34. Acquiring consent from listeners (sketches by UNIVIE)

Our design exploration for the legal screens mock-up allowed us to get a first “look and feel”. From these first sketches, it was clear that legal texts could not be fitted into one screen if the content should be readable at a glance (see Figure 35, left). As a deliberate (and provocative) design choice, we used a small, just readable font (see Figure 35, right). Text is scrollable and presented in monolithic form (instead of text being split into two or more screens). The intention is for the users to scroll down to reach the end of the text, and then press the “Read and Understood” button at the end of the screen.

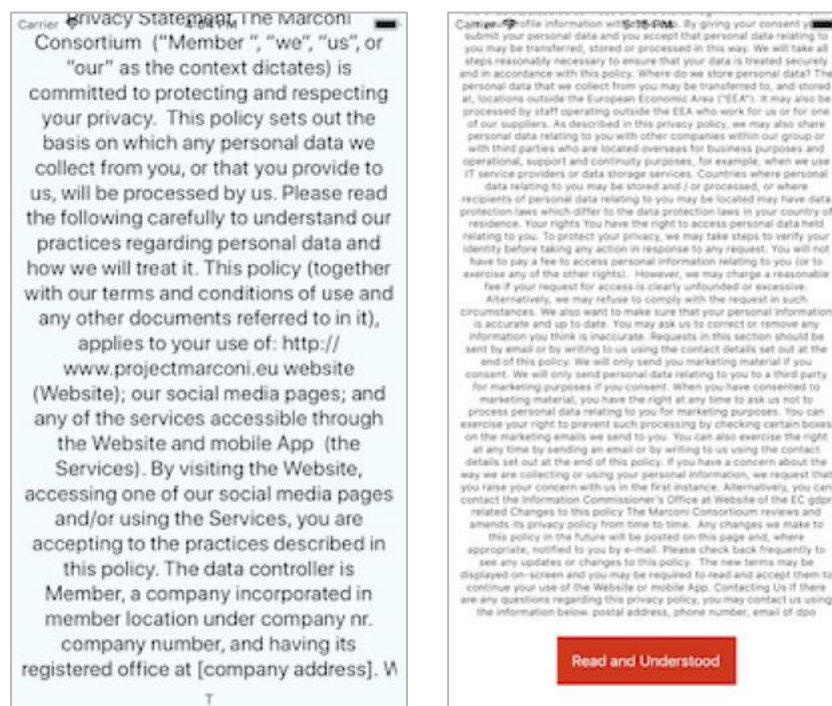


Figure 35. Font size for better readable screen (left); Smaller font taken for mock-up (right).

Figure 36 presents an elaboration of the sketches created by UNIVIE, giving an overview of the workflow for registering for the app, reviewing legal text, and giving consent to use a service.

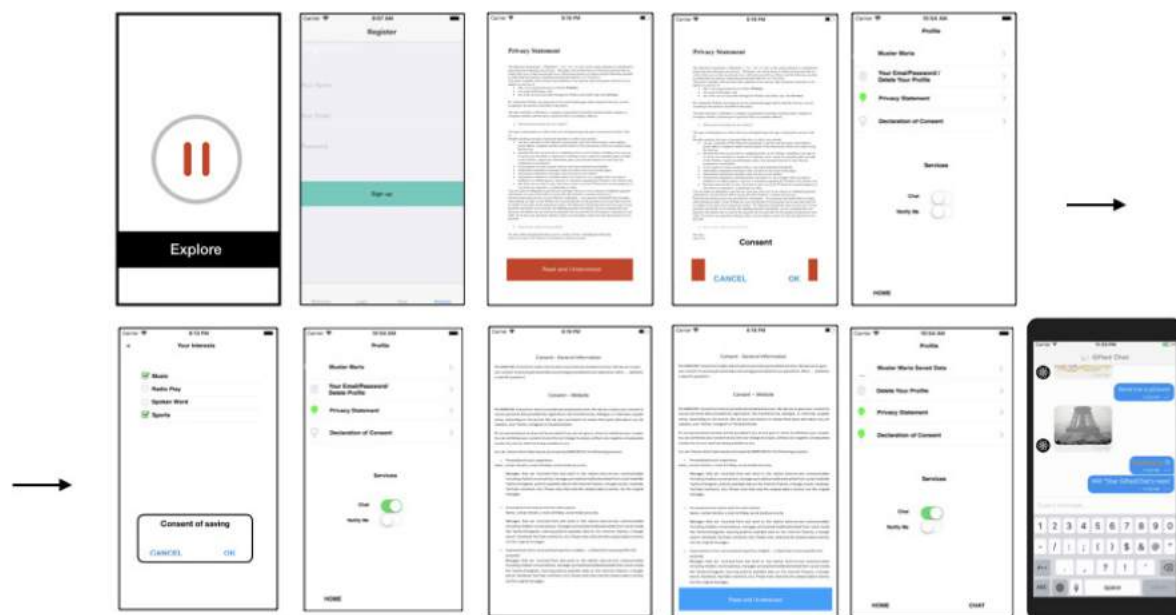


Figure 36. Screen flow of the “legal screens” mock-up.

We complement the screen flow presented in Figure 36 with a scenario about “Maria”, a listener that logs in to the MARCONI mobile app for the first time. We use this scenario to illustrate the process for obtaining legal conformity when using basic app services:

*“Maria Muster listens to her favorite radio station and wants to explore more. She wants to chat with the studio if that is possible, but she has never logged in before with the MARCONI app. Maria presses the Explore button, and the register screen is displayed. After filling in her nickname, email address, and password, a screen containing the privacy statement appears. She reads the text because she wants to be informed about what happens with her personal data, and scrolls down where the button “Read and Understood” gives her the opportunity to register.*

*A pop-up window is displayed, asking for consent to save her personal data. The profile screen opens, showing her name, together with a “green light” indicator on the link to the Privacy Statement. She wonders what data is saved under her name and swipes to the next screen.*

*The subsequent screen presents checkboxes with categories of interests, such as music or sports, which she can enable or disable. These categories are used to personalize the app according to her interests. When Maria tries to go back, a system dialog pops up asking consent to save her interests. She accepts, and returns to the profile screen.*

*Maria notices a toggle switch under the “Services” section of her profile. This toggle switch can be used to enable or disable the chat. She enables the chat and a new screen opens with a declaration of consent where all services including the chat are explained in easy words. This screen also contains information about what data will be processed.*

*Maria clicks on the “Read and Understood” button to proceed. She is returned to the profile screen where a “green light” indicator in the declaration of consent link signals her that she has given her consent to a chat service and its associated data processing. The chat is now active, so Maria can finally*



chat with the studio. All her saved data from the registering process is visible under an email/password/delete profile, where Maria could also delete her profile and all saved data.”

## 5.3 Mock-Up Evaluation Workshop with Radio Professionals and Listeners

### 5.3.1 Methodology

We organized an evaluation workshop on the March 23rd, 2018 at SFilter. The objective of this workshop was evaluating our “Legal screens” mock-up with a mixed team of radio professionals and listeners. Our workshop included a total of six participants. Two listeners (marked \* in Table 10) could not physically join the session, but were connected via video call simultaneously in a second session on the same day. Table 10 gives an overview of the workshop participants.

Table 10. Details of the participants of the mock-up evaluation workshop.

Participant	Occupation	MARCONI stakeholder group	Gender	Age
P1*	Journalist	radio maker	female	28
P2	Journalist	listener	female	26
P3*	Designer	listener	male	25
P4	Social Worker	listener	male	51
P5	Rap Singer, Journalist	radio maker	male	30
P6	Editor	radio maker	female	31

We used the evaluation methodology described in [Section 2.2.2.2](#). The mock-up was presented to participants in a digital form. We created a Keynote slide presentation including all the screens. This presentation was used to facilitate introducing the screens and the scenarios to the participants. The tasks that guided this evaluation workshop are summarized in Table 11.

Table 11. Tasks evaluated during the mock-up evaluation workshop.

Task	Description
Task 1	Register a profile and save personal interests
Task 2	Enable a service
Task 3	Overview for enabling a service (Task 1 + Task 2)
Task 4	Present the idea of “green lights” as indicators
Task 5	Present legal texts – focusing on finding out if participants could read the text easily

### 5.3.2 Results of the Evaluation Workshop

The results of the evaluation workshop are summarized according to the different tasks performed (see Table 11).

**Task 1:** All participants were able to explain what steps they had to follow for registering. They were able to read the privacy statement by scrolling to the “Read and Understood” button. However, four participants were not satisfied since they had to consent for saving their personal login data, but were not used to doing so in the past. The obligation of declaration of consent for using their personal data for personalization purposes did not convince participants P1 - P5.

**Task 2:** Younger participants (P1, P2, and P3) would just scroll down and press the “Read and Understood” button without reading the legal text. The older age group (P4, P5, and P6) just read the first lines and scrolled down to the button. Only P4 tried to read the text. Scrolling was simulated by clicking to the next Keynote slide. These participants found it efficient to enable (or disable) each service separately.

**Task 3:** We showed an overview of the workflow from welcome screen to the chat screen (Task 1 + 2). All participants pointed out that they had to click, swipe, or scroll quite a lot to get to a result. However, the process seemed to be clear and efficient enough for them.

**Task 4:** All participants liked the idea of visualizing their consent to use specific services by a “green light” indicator, and also the possibility of reading the associated consent forms afterwards as they linked in the profile screen (see [Appendix B, section B3](#)). All participants appreciated the clear structure of the profile screen, with all the relevant data presented separately.

**Task 5:** None of the participants complained about the font size of the legal texts. We used a very small font size in our mock-up in order to provoke a reaction and enable discussion on this topic. Interestingly, only P4 mentioned that it would be helpful if the “important” parts in the legal text could be marked in bold or in a different color.

## 5.4 Conclusion

The mock-up evaluation showed that it is not trivial to consider the legal demands within our user-centered design process. In our opinion, the costs of adjusting an existing non-GDPR-compliant solution should not be underestimated. Legal texts should be written in an easily readable way, and be kept as brief as possible while fulfilling the law. The consent processes should be guided in a user-friendly manner. The goal of the next iteration of our mock-up is to create a high-fidelity prototype, improving the “look and feel” and the ease of use of the consent process while complying with legal demands.

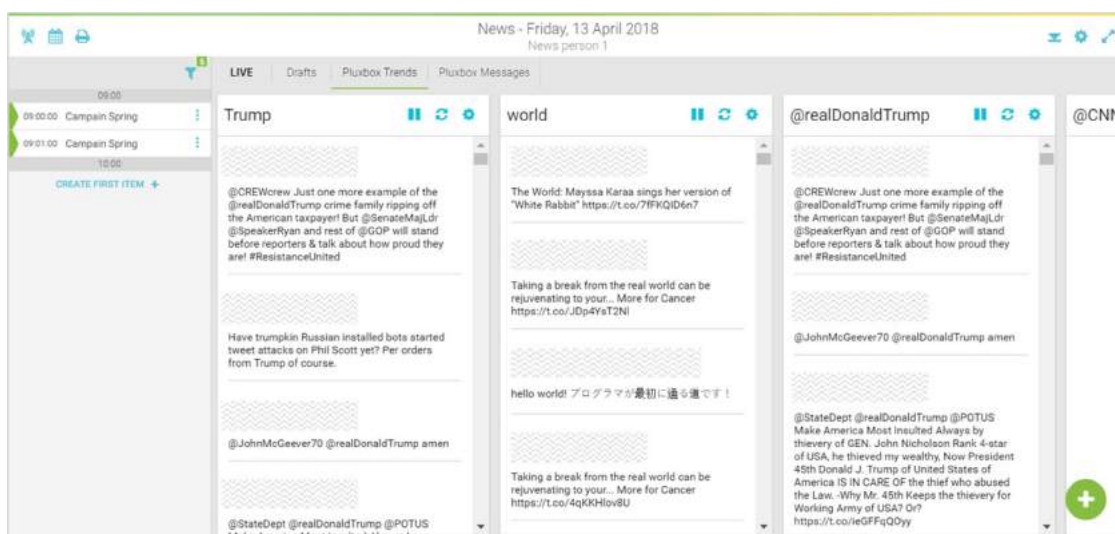


## 6 UHasselt: Trends, Pinboard, and Messages Mock-Ups

### 6.1 Introduction

The starting point of our design exploration were two beta features to be deployed in the Pluxbox RadioManager software: *Trends* and *Messages* (as shown in Figure 37).

(a)



(b)

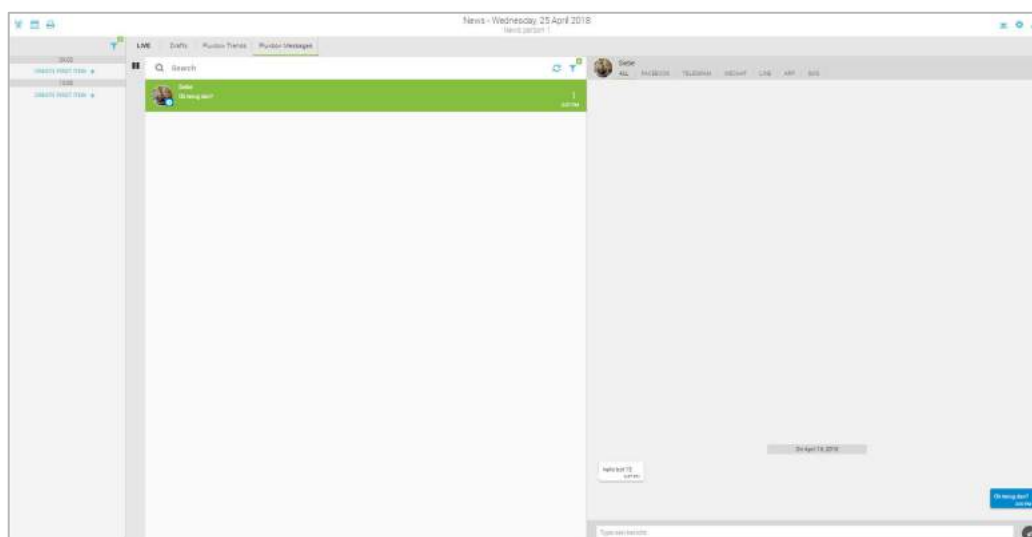


Figure 37. Beta features to be deployed in the Pluxbox RadioManager software: (a) Trends and (b) Messages. Please note that we anonymized personal information included in the Trends feature (Twitter accounts and profile pictures) with a gray pattern.

The Trends feature (see Figure 37a) connects RadioManager with social media accounts, allowing users to create lists of content (or “trends”) extracted from these accounts. For example, a user creates a trend named “Rock Werchter”. The Rock Werchter trend will contain all the posts in Twitter (or

Instagram) that include this keyword. The radio maker will then be able to overview the tweets associated to Rock Werchter in RadioManager. The Messages feature (see Figure 37b) is a space to receive and reply to messages from the audience. This feature integrates a variety of communication channels (e.g. Facebook, WhatsApp, Telegram), facilitating for radio makers to keep track of audience interactions. We collaborated with Pluxbox in order to evaluate and expand these features, exploring how they could be integrated into the MARCONI mock-ups.

## 6.2 Preliminary Mock-Up and its Design Process

### 6.2.1 Inspiration – Reviewing Pluxbox Beta Features

We organized an *expert review* to evaluate the usability and user experience aspects of the Trends and Messages features of Pluxbox RadioManager. Expert reviews are structured explorations to uncover the most noticeable usability issues of a system. Results of an expert review might improve the experience of potential users when realizing task-based evaluations [6]. The main focus of this study was to evaluate the beta implementation of the Messages and Trends features, exploring how these features could better support the work practices of radio makers. The expert review was the starting point for exploring the concepts behind the Trends and Messages beta features in the scope of MARCONI mock-up activities.

The expert review was conducted by a usability expert of Hasselt University. This expert has a background in psychology, with a doctoral degree and 8 years of experience in Human-Computer Interaction (HCI), currently working as a post-doc researcher. The reviewer had basic knowledge about the work practices of radio makers, and was involved beforehand in the MARCONI project. The expert review took place in April 2018 and had a duration of one full working day. The *Usability Heuristics* defined by Nielsen<sup>1</sup> were used as evaluation guidelines. These heuristics are widely accepted as relevant principles for evaluating the interactive aspects of interfaces. An internal report was created to capture identified usability issues via screen captures, highlighting the problem, and including a detailed explanation and proposed solution whenever it applied. A remote meeting was organized to share and discuss this internal report with Pluxbox.

The results of the expert review revealed that the Trends and Messages beta features already included most of the necessary technical functionalities. However, we noticed a critical need to reflect on how these features could be adapted to fit the work practices of radio makers. As a summary, we detail four challenges and opportunities that were uncovered by the expert review:

1. Facilitate the learnability of the features by including contextual information about their functionalities. This could be achieved, for instance, by rephrasing dialog messages to make them more precise and informative.
2. Improve the ways for organizing content in the Trends and Messages features. Cluttered interfaces with overwhelming amounts of information should be avoided. A clear navigation structure should be provided.
3. Elaborate on the flow of actions for interacting with the content included in the Trends and Message features. For instance, improving the mechanisms for showing updates, filtering messages, and finding novel ways in which users could interact with the content (e.g. share a tweet to a colleague or download a conversation).

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<sup>1</sup> <https://www.nngroup.com/articles/ten-usability-heuristics/>



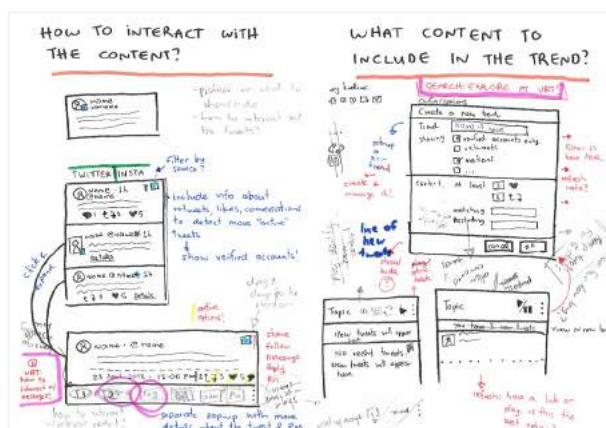
4. Reduce the amount of irrelevant options, since it diminishes visibility of important information. Features that are the most attractive to radio makers should be moved to the most visible places.

These four principles were used as a basis for a subsequent design exploration of how these beta features could be fitted into the MARCONI platform. The section below describes the design solutions we explored and evaluated together with relevant users and stakeholders.

## 6.2.2 First Version – Initial Sketches and Paper Mock-Up

The first sketches of the “Trends, Pinboard, and Messages” mock-up were created using the beta features of Pluxbox RadioManager and their expert review as sources of inspiration. In the initial sketches, we envisioned to have a “pinboard” that radio makers could use as a bulletin board to pin down content from both the Trends and the Messages features. The Pinboard feature was deemed important to support the integration of the RadioManager beta features into the MARCONI workflow. The first version of this mock-up evolved from “messy” initial sketches (see Figure 38a) into a simple, paper mock-up (see Figure 38b). The paper mock-up was used to elicit feedback from prospective users. Paper prototypes are useful for gathering early feedback since people perceive them as “unfinished” and therefore open for discussion and improvement [7].

(a)



(b)

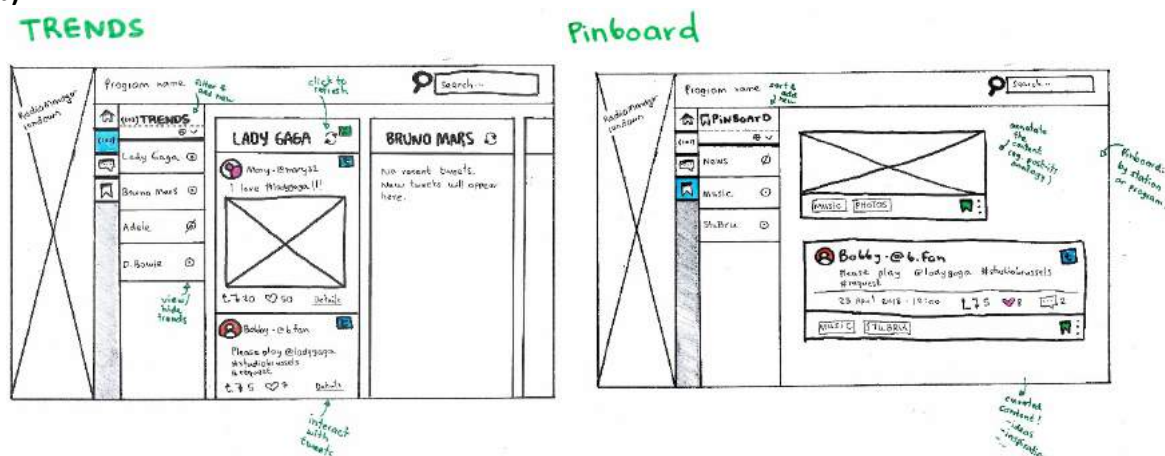


Figure 38. First versions of the “Trends, Pinboard, and Messages” mock-up: evolving from (a) “messy” sketches into an (b) initial paper mock-up.



The initial sketches were discussed and iterated internally by a multidisciplinary team at UHasselt, including disciplines such as design and software engineering. We arranged a remote meeting with Pluxbox in order to gather their opinion as domain experts. Keeping with the RadioManager environment, all messages can be drag-and-dropped to the rundown, and this rundown is always visible to facilitate creating content with the messages from the audience.

To evaluate the initial paper mock-up, we organized informal, early feedback sessions with two HCI researchers (one male, one female) in order to detect critical usability issues. These feedback sessions applied the unified evaluation methodology described in [Section 2.2.2.1](#). The facilitator of the session narrated to participants the potential tasks that users could realize with the mock-up. Afterwards, participants were asked for their opinions in terms of what they liked about the mock-up and what they would change about it.

The results of this informal, early feedback session indicated that the mock-up could benefit from more flexibility on how to show content (e.g. multiple boards in the Pinboard feature, each dedicated to a specific topic). Additionally, the importance of drawing a line between “user generated” and “system generated” content was detected (e.g. categories in the Trends feature are envisioned to be system generated).

The collected feedback was applied to iteratively produce a second version of the mock-up, which is presented in the section below.

### 6.2.3 Second Version – Digital Mock-Up

The second mock-up was created based on the input received by domain experts (i.e. Pluxbox and HCI researchers). We aimed to create a low-fidelity prototype that was polished enough to communicate its functionalities, but still be “unfinished” and exploratory in order to elicit feedback. Next, we describe the rationale for the core features of this prototype.

#### (A) Trends

Figure 39 depicts the Trends feature, which connects with social media accounts, such as Twitter, allowing users to create a “trend”, which is a list of social media content related on a specific, user-defined keyword (e.g. Lady Gaga). This feature allows radio makers to overview all (social) content associated to that keyword (e.g. all tweets mentioning Lady Gaga). Users can group trends in order to facilitate navigating between them (e.g. Lady Gaga is found under the music category). These categories have the intention of helping users to manage a large number of trends. Individual trends could be shown or hidden (eye icon). We added contextual information to keep users informed when there is no content to display.



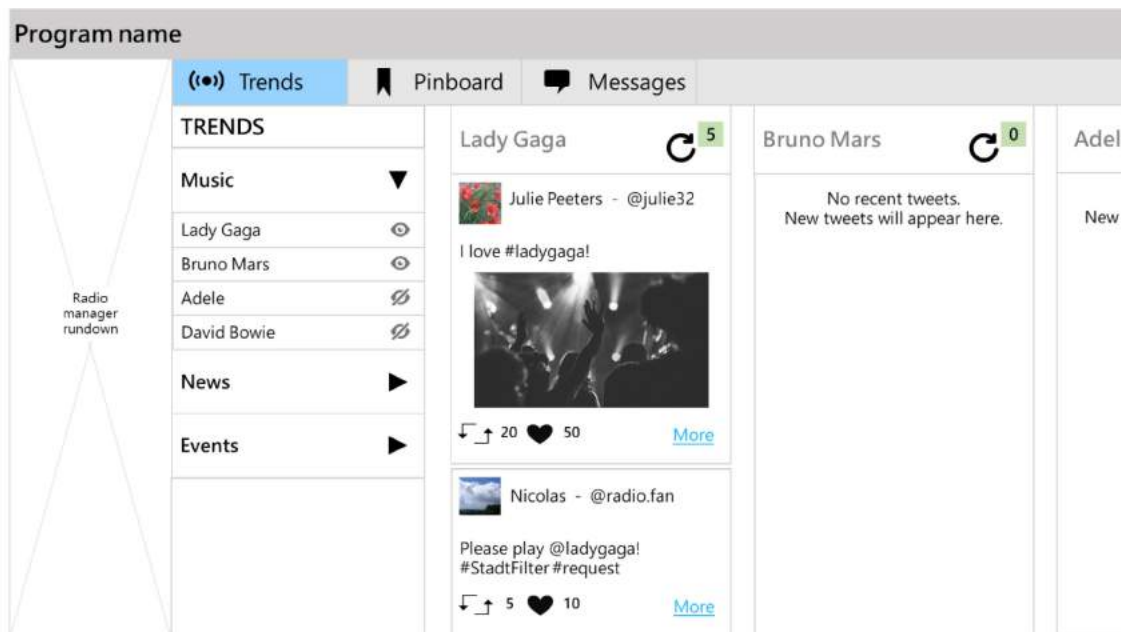


Figure 39. Mock-up screen depicting the Trends feature.

Each message in the trend includes the content, including images, and information about the retweets and likes. This information can help to identify the most relevant posts. Clicking on the “More” link will expand the tweet, giving more details and affording the option to pin, archive, delete, download, or share the tweet. An expanded message visualization is illustrated in Figure 40. Tags can be added as a way to further categorize the message. Additional options, such as archive or share, are accessed by clicking on the menu icon (three vertical dots on Figure 40). All individual messages can be dragged and dropped into the RadioManager rundown.

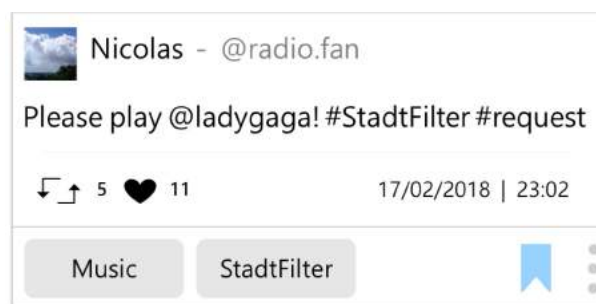


Figure 40. After clicking the “More” button, trends messages are expanded, and users can tag or bookmark them.

## (B) Messages

The Messages feature, depicted in Figure 41 was organized using an inbox, in which individual messages can be marked as “pending” (e.g. to reply later) and “assigned” (e.g. to ask a colleague for a reply). The status of each message is indicated by the star icon (e.g. pending messages are assigned with a blue star icon). This feature was inspired by the outcomes of the co-design workshop described in [Section 4.3](#). When a message in the inbox is clicked, it opens the conversation contextualized to the profile of the user. The radio maker could then also explore other messages from the same listener but shared via different communication channels. Individual messages can be added to the Pinboard. Attached images are previewed in the conversation.

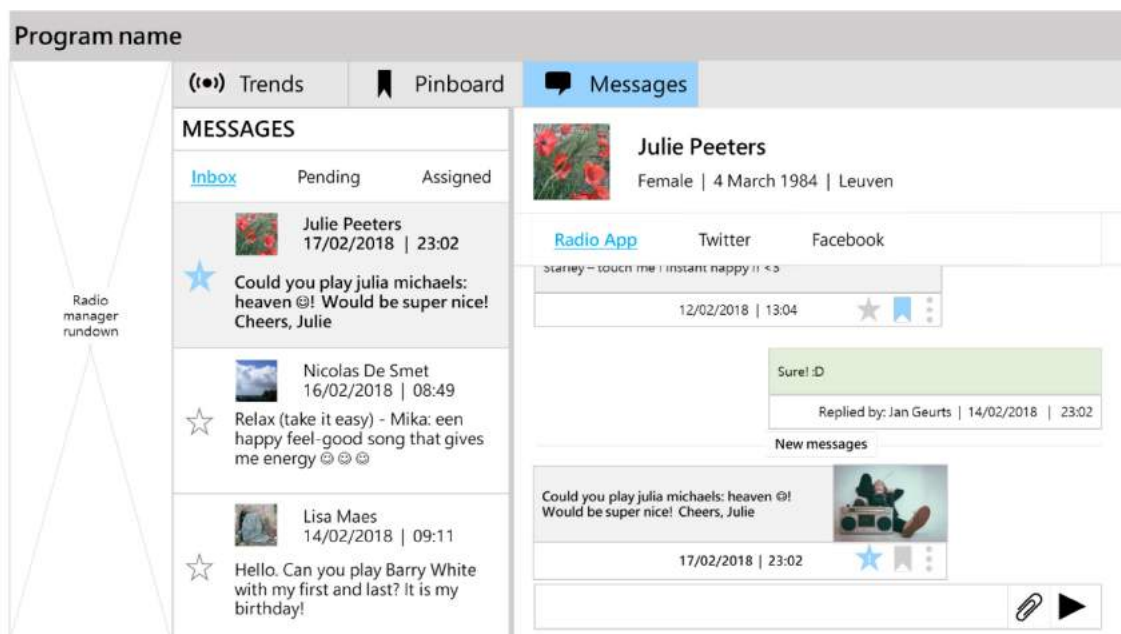


Figure 41. Mock-up screen depicting the Messages feature.

### (C) Pinboard

The Pinboard feature (see Figure 42) includes all the content that was marked with the “bookmark” icon (e.g. a Tweet appearing on Trends, or a message sent by a listener via Messages). Pinboards are organized by categories. These categories could be system-defined, based on tags, or user-defined in order to facilitate organizing data. Each board (e.g. music, news, art) can contain any number of articles, photos, messages, etc. These boards can be curated collaboratively, as different team members can contribute to them.

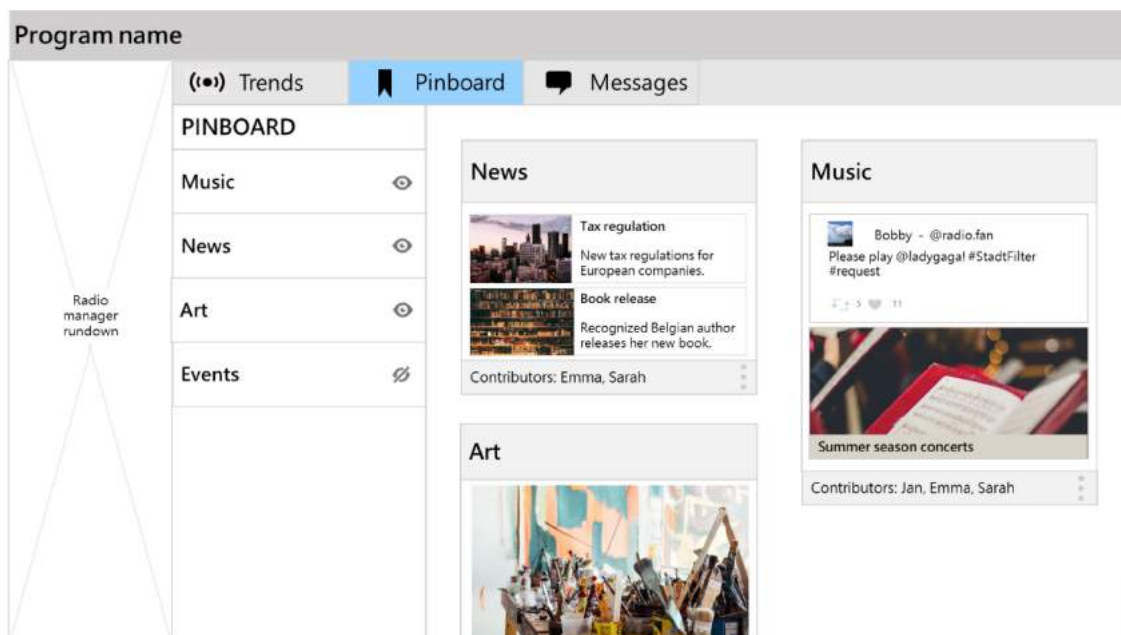


Figure 42. Mock-up screen depicting the Pinboard feature.

## 6.3 Mock-Up Evaluation

### 6.3.1 Methodology

A small-scale, formative usability study was conducted to gather feedback from end-users. Three radio makers (2 female, 1 male) participated in this user test in May 2018. The participants had experience in radio making, either as editor (P1 and P3) or musical director (P2), and all tested the mock-up individually. Each session was conducted remotely, and lasted around 30 minutes. This formative user study was conducted using a semi-structured protocol including a walkthrough, similar to the cognitive walkthrough technique [6]. The methodology was akin to the one presented in [Section 2.2.2.2](#). A facilitator conducted each test using Google Hangouts, sharing video and audio. Each participant received a link to access a Google Slides document at the onset of the test. This document held the material for the test, such as informed consent document, mock-up screens, and ASQ questionnaires. This shared document facilitated common ground among the participant and the facilitator.

At the beginning of each test, the participants were briefed about the objectives and practical details of the session, and were asked to sign an informed consent. Afterwards, the facilitator guided the participants through three scenarios, each of which concerned a set of features and interactions with the mock-up. The facilitator used the shared Google Slides document to introduce the mock-up screens to realize the scenarios. Each scenario contained around 4 simple tasks (e.g. add a message to the pinboard), and the ASQ was used after its exploration. Furthermore, participants were invited to reflect on how the mock-up was applicable to their work practices, and to give critical feedback on how it could be improved. After the walkthrough was finished, participants were briefly interviewed to gather their final impressions about the prototype.

The notes gathered during the sessions were analyzed to search for recurrent topics and comments. The data analysis led us to relevant findings on how to improve the mock-up. Given the small sample, no statistical analysis techniques were employed for the ASQ questionnaires. However, this technique was useful to gather feedback in a uniform way, and guided the discussion after each scenario.

### 6.3.2 Results

There was consensus that the “Trends, Pinboard, and Messages” mock-up was simple to understand, and proposed valuable features. For instance, all participants mentioned that the three features were interesting, and that the Messages feature was particularly attractive for radio makers. However, there was also general consensus that these features are not necessarily compatible with our participants’ current work processes. This was especially the case of the Trends feature, as all three participants had some doubts on how it could fit in their current workflow. A general conclusion from our evaluation is hence that the three tested features could represent novel ways for interacting with listeners, but we have to make sure that they can be properly adapted to the everyday workflows of radio makers.

#### Trends

All participants either agreed or strongly agreed on being satisfied with the ease of completing tasks with the Trends feature. However, its alignment with their current work practices was controversial. P1, an editor and radio maker, mentioned even that this feature felt unfamiliar to her, and that she would like to try it as a way to connect with her audience “on-air”. P2 and P3 were more skeptical about the Trends feature. Both participants felt that this feature was not very relevant to their current way of working. One of the central goals of the Trends feature was to aid radio makers to find and use relevant, “breaking” (social) content when preparing a radio show. However, two participants (P1 and P2) mentioned that they adopt a very spontaneous approach to show preparation, in that they seldom prepare material in advance or use nothing more than a very simple program schedule and tools (e.g.



paper or Excel sheet). For these participants, live interactions were more interesting, and they would prefer features that help them with that. Conversely, P3 focuses on pre-production, and invests time in preparing radio show content. P3 also pointed out that audience interaction is much more relevant than a script, and is anyway not very active on using social media as “input” for creating radio content.

### Messages

The Message feature was very well-received by all participants. They found it to be the most relevant feature of this mock-up, and would very much like to test it as part of their everyday work practices. The reason for its “success” was that it focuses on live interactions, and facilitates their current way of working. For instance, while on-air, P1 currently uses the digital “bulletin board” of the radio station, which is a simple, public board where the audience can add messages, to which she then replies “on-air”. For P1, having an inbox to manage the messages is a good idea, since she frequently loses overview of the conversations. P1 and P3 found it interesting to have several channels of communication (e.g. Facebook, Twitter, Radio App, etc.), as they would like to hear more from the listeners (and supporting multiple communication channels would definitely be a good step in this direction). P3 particularly liked the idea of “funneling messages into one inbox.” In contrast, P2 thought that there were “too many channels of communication”, and would prefer to make it flexible, so that each program or station could decide on which channels to support (and which not). Regardless of the amount of communication channels they preferred, all participants mentioned to keep different channels separated, instead of merging a long list of comments originating from multiple communication media into a single conversation thread.

### Pinboard

The Pinboard was considered as a novel feature that was worth exploring. Much like the Trends, this feature was “a big step away” from their current work practices, but radio makers imagined that it could be useful. P2 thought it was a great feature, both for preparing radio shows and for using collected information on-air. He believed that this feature could be used to create a roadmap for a program’s content. His current practice is to have several browser tabs open in parallel (e.g. with different news sources), and use them to guide the direction of the show. Thus, the Pinboard could be useful if he could add the content from different websites into one space. This implies that the Pinboard should be expanded beyond social media content (e.g. akin to the Pinterest approach). P3 found that a proper contextualization of the Pinboard feature with the *rundown* of RadioManager is critical, as she could guide the show using both of these features. P3 would also like to use it for collecting interesting content for pre-production tasks or to guide a show on-air by keeping track of “the things that I want to talk about”. However, she hoped for content to be broken into simpler ways, avoiding content overload. This comment by P3 indicates a need of exploring in detail how to organize the boards in order to facilitate information retrieval.

## 6.4 Conclusion

The design process of the Trends, Pinboard, and Messages features taught us valuable lessons that will guide the next iteration of this mock-up (or its translation into a functional prototype). The most critical point is to make a clearer distinction between “live features” (i.e. those to be used on-air) and “pre-production features”. Radio makers find the live features far more critical, as they want to have better ways to interact with their audience. The radio makers involved in our evaluations were positive and open to new ways of working, but invited us to focus on the features for interacting with a live audience. For them, live interaction was more attractive than social media connection or other features for preparing content.





## 7 Discussion and Concluding Remarks

In this section we reflect on the user-centered approach we followed to design and evaluate multiple MARCONI mock-ups. We will discuss the challenges for future prototypes, and the next steps in consideration of the user-centered design process.

A key objective of D4.1 was to build upon the MARCONI user requirements and scenarios. To ensure that we correctly transferred WP1 knowledge into exploratory mock-ups, we organized an *intra-consortium mock-up workshop*. Through the methodology set out in this workshop, the abstract and mostly textual user requirements and scenarios were turned into visual representations. Evolving from user requirements towards prototypes can be very challenging, since important pieces of knowledge can be forgotten or underexposed. By using co-design and contextual design techniques during this workshop, we enabled common ground between the MARCONI consortium partners. This common ground facilitated us to prioritize MARCONI requirements, ensuring that the critical concepts were then converted into mock-ups. Additionally, this common ground extended positively to the technical development work packages, where it helped to streamline technical development objectives.

Each of the partners involved in this deliverable (NPO, VRT, SFilter, and UHasselt) was in charge of evolving a mock-up (or set of mock-ups) according to their expertise, interests, and/or organizational vision. As a result, we have explored and reported on a diversity of features in this deliverable, including functionalities for searching, messaging, and sharing data. It is only natural that there is an overlap on some of the concepts (e.g. messaging features in VRT and UHasselt mock-ups; listener apps in SFilter and NPO mock-ups). Given the early stage of the UCD process, it was valuable to explore as much alternatives as possible, as this could serve to find the most optimal solutions for the MARCONI platform.

One of the core principles of UCD is the involvement of end-users throughout the design and development process. For this reason, we conducted early feedback sessions as well as formative, small-scale user tests for gathering input from our target users. By largely following a unified evaluation methodology, we gathered feedback in a uniform and consistent manner. This allowed us, up to a certain extent, to compare and contrast design solutions. Further iterations of these mock-ups (e.g. in the form of functional prototypes) will be informed by the results of these tests. For instance, the messaging features in the VRT and UHasselt mock-ups could be integrated by exploring the best of both approaches. Since the feedback was gathered with the same methodology, we can make inferences of “what worked best” in a more precise way.

Table 12 presents an overview of the most relevant feedback for those explorations that were done following the unified mock-up evaluation methodology reported in [Section 2.2.2](#):

Table 12. Summary of findings described in Sections 3 – 6 of this deliverable.

Mock-up	Core findings of the mock-up evaluation
<b>Chatbot</b> (See <a href="#">Section 3</a> )	<ul style="list-style-type: none"> <li>Quality and accuracy of the responses of the chatbot will largely determine its success.</li> <li>Users should be aware that the chatbot responds based on AI (e.g. explicitly mention that a system is answering their questions).</li> <li>Information about the capabilities of the chatbot should be explicit. Users want to know “what’s in” for them. “Log in” option should offer real added value to the listeners.</li> <li>Starting a conversation should be as straight-forward as possible. Users should be able to ask questions straight away (without a walkthrough).</li> </ul>
<b>Search functionality</b> (See <a href="#">Section 4</a> )	<ul style="list-style-type: none"> <li>Investigating search behaviors shed light on the work practices of radio makers, and how they interact with their audience.</li> <li>Keeping an overview of the messages is important to detect the sentiment of the audience.</li> <li>Features to facilitate searching, such as using auto complete, navigating results and filtering messages “live” are critical for this feature.</li> </ul>
<b>Radio app and legal screens</b> (See <a href="#">Section 5</a> )	<ul style="list-style-type: none"> <li>Legal and privacy considerations should be an integral part of the design process for the MARCONI platform. For this, a collaboration with UNIVIE proved very useful to fulfill the legal requirements.</li> <li>Users should be able to read the legal texts easily and quickly. Consent issuing should be designed to be as easy as possible. These are not trivial activities for listeners and should be explored in detail.</li> <li>Complying with both legal requirements and usability heuristics is quite a challenge!</li> </ul>
<b>Trends, Pinboard, and Messages</b> (See <a href="#">Section 6</a> )	<ul style="list-style-type: none"> <li>We should focus on supporting “live features” more than “pre-production” features. For the sampled radio makers, the priority is really to engage with their audience while on-air.</li> <li>Features should be adapted to existing working customs of radio makers; asking them to “take a big leap” and perform routine activities very differently could result in less adoption. However, radio makers were found to be open to experimentation with new features, so we can be innovative while still trying to cater to their current practices as much as possible.</li> </ul>

After analyzing the results of the user evaluations of the MARCONI mock-ups, we conclude that:

- For listeners, we should “earn their trust” by providing transparent information (e.g. privacy and usage of their data; what is the added value of adopting a specific feature). Furthermore, listener-facing services should be simple and smart enough to make them attractive.
- For radio makers, connecting with the audience is a core requirement. Supporting services should fit their current work practices and should be validated for “on air” usage.

While creating mock-ups is vital for the UCD process, these prototypes are intermediate steps in an iterative process and hence need to be refined further and then validated. As a next step, we suggest integrating the most suitable features of the explored mock-ups into a high-fidelity prototype (e.g. add

legal consent screens when creating a chat account). This integration is feasible, since each mock-up deals with related sub-problems that share a single overarching context, namely interactive radio.

It is also worth noting that WP4's iterative design and evaluation activities should inform and drive the technical development of the MARCONI platform. Therefore, close collaboration should exist between WP3 and WP4 partners. To this end, a second intra-consortium workshop will be organized during the plenary meeting to take place in Winterthur, Switzerland in June 2018. This second workshop will have the objectives of (1) aligning the WP4 piloting activities to the MARCONI mock-ups reported in deliverable D4.1, (2) defining how the MARCONI mock-ups will be incrementally iterated, and, (3) communicating these mock-ups to the rest of the consortium, ensuring that they will steer the technical development of the MARCONI platform and its composing services.



## Appendix A

Below, 7 slides present the flow of VRT's listener conversation search tool in a mock-up. This mock-up was presented to radio makers and discussed in [Section 4.3](#).

### Slide 1

The mock-up for Slide 1 shows a search tool interface. At the top is a search bar with the placeholder text "Enter your search" and a magnifying glass icon on the right. Below the search bar are four filter buttons: "Content", "Date", "Tags", and "Location", each with a downward arrow. In the center of the interface is a box titled "Today's trending topics" which contains a word cloud. The word cloud features the word "happy" in large, bold, black script. Other words in various sizes and orientations include "valentine", "mijn", "Valentijn", "Beast", "V-Day", "mooi", "geliefde", "instant", and "day".

### Slide 2

The mock-up for Slide 2 shows the same search tool interface as Slide 1, but with the word "Happy" entered into the search bar. The filter buttons and the "Today's trending topics" word cloud remain unchanged.

## Slide 3

Content
Messages
Video
Images

Date
Between:  
[enter date] and  
[enter date]

Tags
Good speaker
Morning listener
Evening listener

Location
Antwerp
Limburg
East Flanders
Flemish Brabant
West Flanders

Today's trending topics

instant day valentine  
happy  
mooi geliefde  
Valentijn  
Beast  
V-Day

## Slide 4




Content
Date
Tags
Location

☒ Messages
☒ Good speaker
☒ Flemish Brabant
[Remove filters](#)


Source	Name	Message	Date and time
<input type="checkbox"/>	Nicolas De Smet	Relax (take it easy) - Mika: een <b>happy</b> feel-good plaat die enrgie geeft maar toch alles lekker op het gemakje doen in het weekend ☺☺☺	16/02/2018   08:49
<input type="checkbox"/>	Julie Peeters	Helloo zouden jullie deze kunnen afspelen julia michaels: heaven ☺! Zou supper tof zijn !! <b>Happy valentine!</b> Grtjs lindsay	14/02/2018   23:02
<input type="checkbox"/>	Lisa Maes	Hoi brahim. Zou je barry white met my first and last willen spelen voor mijn papa die 65 is geworden? <b>Happy</b> birthday ouwe;-)	14/02/2018   9:11
<input type="checkbox"/>	Robin Vermeulen	Wat en mooi lucht om met je geliefde naar te kijken <b>happy</b> Valentijn	13/02/2018   14:58
<input type="checkbox"/>	Simon Dubois	Ik word instant <b>happy</b> van Beast en Higher van Laura Tesoro of Unwritten van Natasha Bedingfield!! :D	09/02/2018   15:15



## Slide 5


Happy				Q
Content	Date	Tags	Location	
<input checked="" type="checkbox"/> Messages	<input checked="" type="checkbox"/> Good speaker	<input checked="" type="checkbox"/> Flemish Brabant	Remove filters	
<input type="checkbox"/>	Delete	Mark as unread	Export to Pluxbox	Download attachments
			Reply to all selected	
Source	Name	Message	Date and time	
<input type="checkbox"/> f	Nicolas De Smet	Relax (take it easy) - Mika: een <b>happy</b> feel-good plaat die energie geeft maar toch alles lekker op het gemakje doen in het weekend ☺☺☺	16/02/2018   08:49	
<input checked="" type="checkbox"/> f 	Julie Peeters	Helloo zouden jullie deze kunnen afspelen julia michaela: heaven ☺! Zou supper tof zijn !! <b>Happy valentine</b> !! Grtjs lindsay	14/02/2018   23:02	
<input type="checkbox"/> SMS	Lisa Maes	Hoi brahim. Zou je barry white met my first and last willen spelen voor mijn papa die 65 is geworden? <b>Happy</b> birthday ouwe :-)	14/02/2018   9:11	
<input type="checkbox"/>  	Robin Vermeulen	Wat en mooi lucht om met je geliefde naar te kijken <b>happy</b> Valentijn	13/02/2018   14:58	

## Slide 6


**Julie Peeters**

**Conversations**

Starley - touch me ! Instant happy !! <3



 10/12/2017 | 13:42

Zeker! :D

Replied by: Jan Geurts | 14/02/2018 | 23:02

**New messages**

Helloo zouden jullie deze kunnen afspelen julia michaela: heaven ☺! Zou supper tof zijn !! **Happy valentine**!! Grtjs lindsay

  14/02/2018 23:02

**Profile**


**Basic information**


Gender: Female  
Date of birth: 14 March 1984  
Location: Leuven

**Tags**



Good speaker Morning listener

**Contact**


 ★ JuliePeeters84

 +32 485 26 015

**Interests**


 

## Slide 7

**Julie Peeters**

Conversations

Starley – touch me ! Instant happy !! <3



 10/12/2017 | 13:42

Zeker! :D

Replied by: Jan Geurts | 14/02/2018 | 23:02

New messages

Heloo zouden jullie deze kunnen afspelen julia michael: heaven ☺! Zou supper tof zijn !! **Happy valentine!!** Grtjs lindsay



  14/02/2018 23:02

Delete

Export to Pluxbox

Mark as unread

Download

Profile

Basic information


Gender: Female  
Date of birth: 14 March 1984  
Location: Leuven


Tags

Good speaker



Morning listener

Contact

 ★ JuliePeeters84

 +32 485 26 015

Interests

## Appendix B

### B1: Privacy Statement

The Marconi Consortium (“[Member]”, “we”, “us”, or “our” as the context dictates) is committed to protecting and respecting your privacy. This policy sets out the basis on which any personal data we collect from you, or that you provide to us, will be processed by us. Please read the following carefully to understand our practices regarding personal data and how we will treat it.

This policy (together with our terms and conditions of use and any other documents referred to in it), applies to your use of:

- <http://www.projectmarconi.eu> website (**Website**);
- our social media pages; and
- any of the services accessible through the Website and mobile App (the **Services**).

By visiting the Website, accessing one of our social media pages and/or using the Services, you are accepting to the practices described in this policy.

The data controller is [Member], a company incorporated in [member location] under company nr. [company number], and having its registered office at [company address].

#### 1. WHAT PERSONAL DATA DO WE COLLECT?

The type of information we collect from you will depend upon the type of interaction you have with us. Broadly speaking, the types of personal data that we collect may include:

- you are a customer of The Marconi Consortium: your first and last name, email address, postal address, telephone number and the details of the transactions like your IP address, timestamp, browser request, browser version, which you conduct using the Services;
- personal data that you provide by completing forms on our Website, including if you sign up to receive our newsletter or attend one of training events, search for a product, place an order on the Website, request any information, place your personal interests or enter into any competition or promotion;
- if you register or create account with us, your log-in and password details;
- information contained in messages when you post on our social media pages;
- information contained in messages when you post on our chatbot
- information contained in communications you send to us, for example when you report a problem or to submit queries, concerns or comments regarding the Website or its content; and
- data from surveys that we may, from time to time, run on the Website for research purposes, if you choose to respond to, or participate in, them.

You are under no obligation to provide any such data. However, if you choose to withhold requested information, you may not be able to access all of the Website’s contents and services.

Payment processing services are provided by a third party. Any payment card details that you input when placing an order via the Website are received directly by the payment service provider and will be subject to its terms of use and privacy policy. The Marconi Consortium does not store any of your payment card details on its systems. By inputting payment card details, you are accepting that your payment card details may be used by the payment services provider for the purpose of paying for your order. If you have any questions relating to these services please contact the relevant payment service provider.

## 2. HOW DO WE COLLECT PERSONAL DATA?

We may collect personal data from you in a variety of ways, including the following:

- when you create a The Marconi Consortium customer account;
- when you provide content and other information when you use the app services or post on our social media accounts;
- when you:
  - provide information in your account or manage/change your account information;
  - contact us by our app;
  - subscribe to receive our newsletter or promotional materials or sign up to a mailing list; and/or
  - participate in surveys, or competitions or other promotional activities.

We also collect information automatically when you navigate through the Website. Information collected automatically may include usage details, geo-location data, IP addresses and information collected through cookies, and other tracking technologies (which may not be information which identifies you). For more information on our use of these technologies, see our cookie policy.

## 3. HOW DO WE USE PERSONAL DATA?

We use information we collect relating to you for the purposes of our legitimate interests as follows:

- to carry out our obligations arising from any contracts entered into between you and us and to provide you with the information, products and services that you request from us;
- to provide you with our newsletters, where you have subscribed to receive our newsletters (please see paragraph 5 below);
- to provide you with information about other products we offer that are similar to those that you have already purchased or enquired about, where you have consented to be contacted for such purposes;
- to ensure that content from this Website is presented in the most effective manner for you and for your computer;
- to administer this Website and for internal operations, including troubleshooting, data analysis, testing, research, statistical and survey purposes;
- to improve this Website to ensure that content is presented in the most effective manner for you and for your computer;
- to allow you to participate in interactive features of our Services, when you choose to do so;
- to liaise with distributors and other partners in connection with your use of the Services;
- to deal with enquiries or complaints;
- as part of our efforts to keep this Website safe and secure;
- to measure or understand the effectiveness of advertising we serve to you and others, and to deliver relevant advertising to you;
- to conduct our internal business and management processes, for example accounting or auditing purposes;

We may combine this data with personal data you give to us and personal data we collect that relates to you. We may use this personal data and the combined data for the purposes set out above (depending on the type of data we receive).

We will anonymize personal data relating to you and consolidate such data. We may provide our distributors and other partners with aggregated anonymized data about the users of this Website and the Services, for example behavioral data.

## 4. DATA PROCESSING OF YOUR PERSONAL DATA

When processing your personal data your individual rights will be protected.

Personal data is collected and processed in a legal and fair manner.



Your personal data is processed only for the purpose that was defined before the data was collected. Subsequent changes to the purpose are only possible to a limited extent and require a substantiation. You will be informed in our global **Declaration of Consent** how your data is being handled.

When the data is collected by a service, you will be informed

- a) who is the data controller
- b) about the purpose of data processing
- c) Third parties or categories of third parties to whom the data might be transmitted

## 5. CONSENT TO DATA PROCESSING

Your personal data can be processed following your consent. Before you give a consent, you will be informed. The declaration of consent is obtained electronically within the app you are using and stored in our database for the purposes of documentation. Each service you will be using will need your consent. By switching a provided service ON, you consent in using the service and processing your personal data by the enabled service. A disabled service will not process your personal data and the service can't be used.

An overview of the enabled/disabled services and the stored login information is shown in your profile information within the app.

By giving your consent you submit your personal data and you accept that personal data relating to you may be transferred, stored or processed in this way. We will take all steps reasonably necessary to ensure that your data is treated securely and in accordance with this policy.

## 6. WHERE DO WE STORE PERSONAL DATA?

The personal data that we collect from you may be transferred to, and stored at, locations outside the European Economic Area ("EEA"). It may also be processed by staff operating outside the EEA who work for us or for one of our suppliers.

As described in this privacy policy, we may also share personal data relating to you with other companies within our group or with third parties who are located overseas for business purposes and operational, support and continuity purposes, for example, when we use IT service providers or data storage services. Countries where personal data relating to you may be stored and / or processed, or where recipients of personal data relating to you may be located may have data protection laws which differ to the data protection laws in your country of residence.

## 7. YOUR RIGHTS

You have the right to access personal data held relating to you. To protect your privacy, we may take steps to verify your identity before taking any action in response to any request. You will not have to pay a fee to access personal information relating to you (or to exercise any of the other rights). However, we may charge a reasonable fee if your request for access is clearly unfounded or excessive. Alternatively, we may refuse to comply with the request in such circumstances.

We also want to make sure that your personal information is accurate and up to date. You may ask us to correct or remove any information you think is inaccurate.

Requests in this section should be sent by email or by writing to us using the contact details set out at the end of this policy. We will only send you marketing material if you consent. We will only send personal data relating to you to a third party for marketing purposes if you consent. When you have consented to marketing material, you have the right at any time to ask us not to process personal data relating to you for marketing purposes. You can exercise your right to prevent such processing by checking certain boxes on the marketing emails we send to you. You can also exercise the right at any time by sending an email or by writing to us using the contact details set out at the end of this policy.





If you have a concern about the way we are collecting or using your personal information, we request that you raise your concern with us in the first instance. Alternatively, you can contact the Information Commissioner's Office at [Website of the EC GDPR related]

## 8. CHANGES TO THIS POLICY

The Marconi Consortium reviews and amends its privacy policy from time to time. Any changes we make to this policy in the future will be posted on this page and, where appropriate, notified to you by e-mail. Please check back frequently to see any updates or changes to this policy. The new terms may be displayed on-screen and you may be required to read and accept them to continue your use of the Website or mobile App.

## 9. CONTACTING US

If there are any questions regarding this privacy policy, you may contact us using the information below.

[postal address, phone number, email of DPO]

*Version 2.0 (SFilter)*

# B2: Declaration of Consent

The MARCONI Consortium [radio station] aims to provide personalized services. We ask you to give your consent to process personal data concerning personalized music experience. More .... [Website or specific question]

## Consent – Website

The MARCONI Consortium aims to provide personalized services. We ask you to give your consent to process personal data provided by registration, list of preferences, dialogue, or interview, as given below, depending on the service. We ask your permission to review third party data about you, for example, your Twitter, Instagram or Facebook feeds.

All non-personalized services will be provided if you do not give or chose to withdraw your consent. You can withdraw your consent at any time (or change its scope), without any negative consequences besides the service itself not being available to you.

You can choose which data may be processed by MARCONI for the following purposes:

- Personalized music experience:
  - Name, contact details, e-mail, birthday, social media accounts,
  - Messages that are received from and send to the station (one-on-one communication including chatbot conversation), messages pinned/starred/bookmarked from social media like Twitter/Instagram, publicly available data on the internet (Tweets, a Google search, Facebook, YouTube comment, etc.). Please note that only the analysis data is stored, not the original messages.
- Personalized interaction with the radio station:
  - Name, contact details, e-mail, birthday, social media accounts,
  - Messages that are received from and send to the station (one-on-one communication including chatbot conversations), messages pinned/starred/bookmarked from social media like Twitter/Instagram, learning publicly available data on the internet (Tweets,

a Google search, Facebook, YouTube comment, etc.). Please note, that only the analysis data is stored, not the original messages.

- Improvement of our services (training of our chatbot, ...): [Data that is processed for this purpose]
  - Messages that are received from and send to the station (one-on-one communication including chatbot conversations), messages pinned/starred/bookmarked from social media like Twitter/Instagram, learning publicly available data on the internet (Tweets, a Google search, Facebook, YouTube comment, etc.). Please note, that only the analysis data is stored, not the original messages.

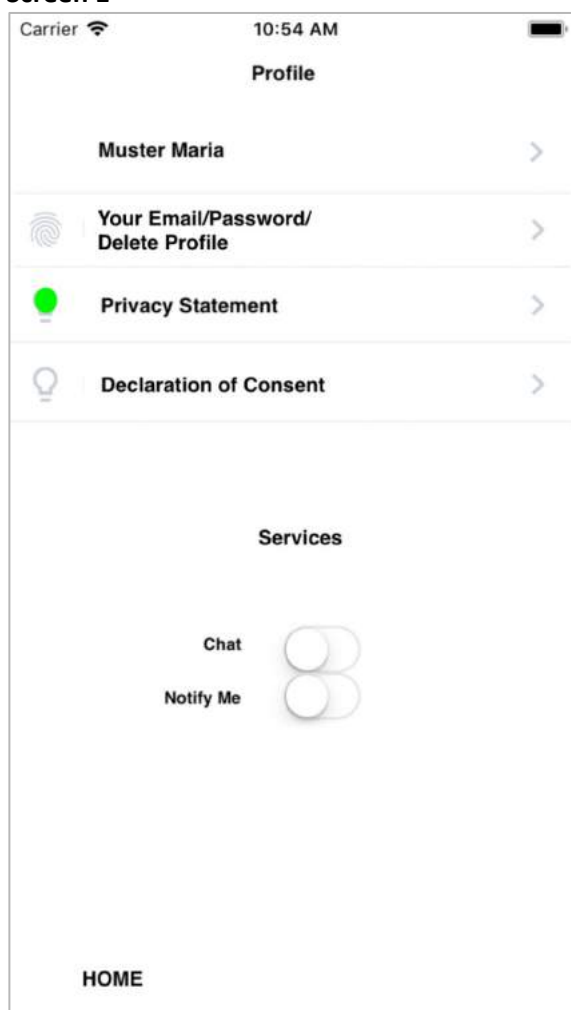
These data may be analyzed for automated profiling. Data protection principles will be respected. The results will be used for improving our services but also for marketing purposes.

Version 1.0 (UNIVIE)

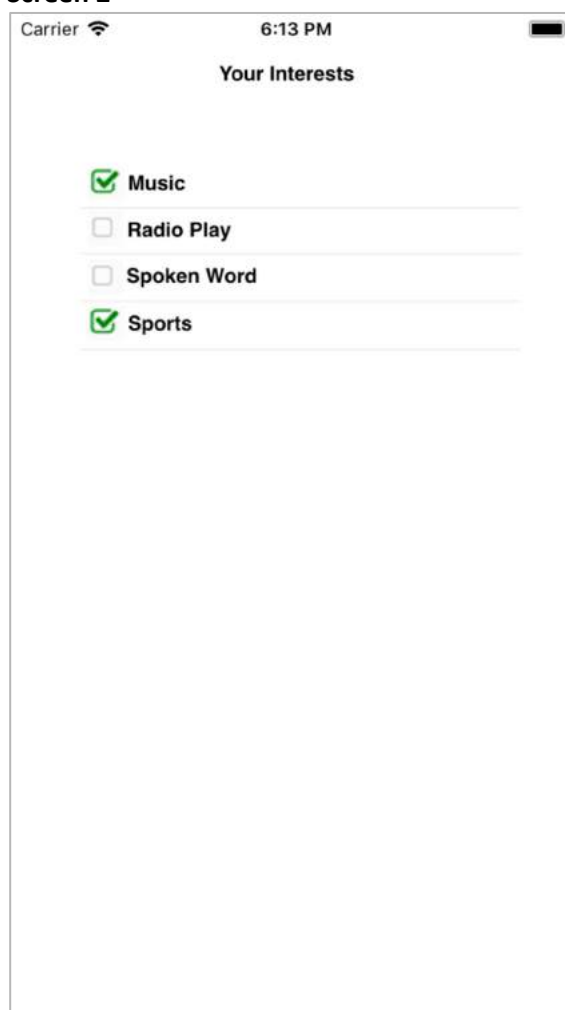
## B3: Legal Screens Mock-Up

Below, four mock-up screens designed by SFilter for the “legal screens” mock-up. This mock-up was presented to radio makers and listeners and discussed in [Section 5.3](#).

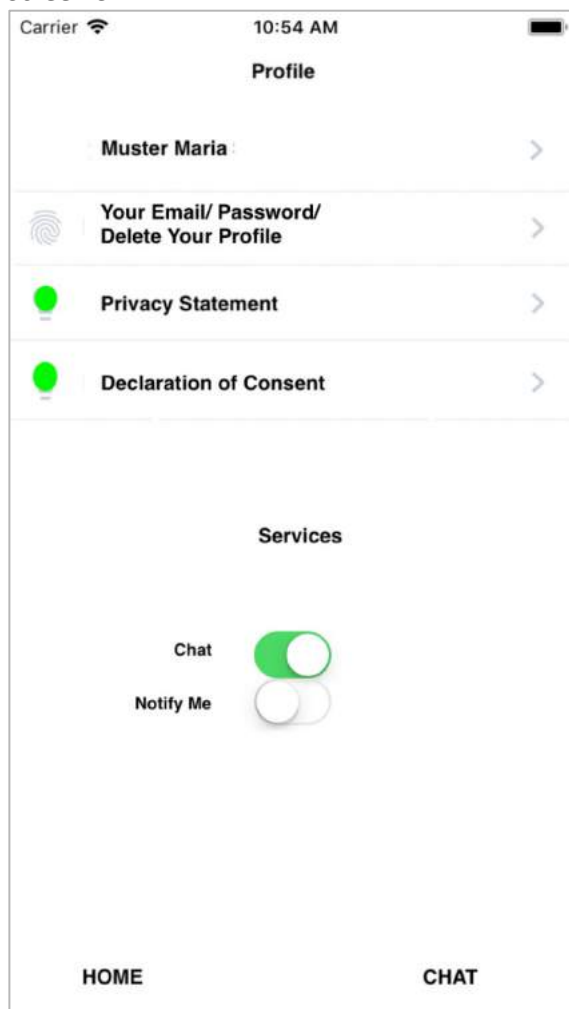
Screen 1



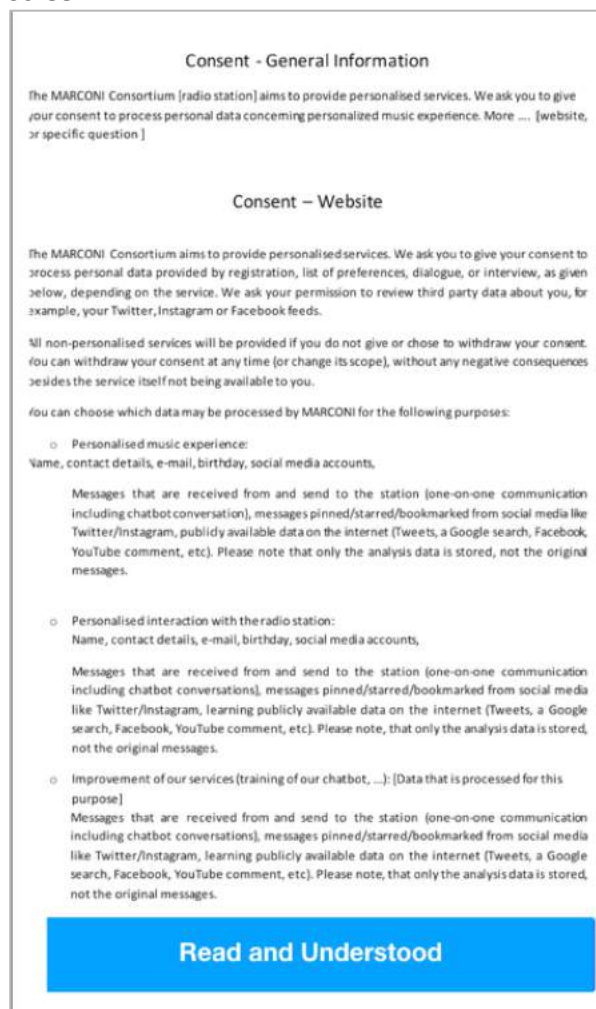
Screen 2



### Screen 3



### Screen 4



## References

1. Hugh Beyer and Karen Holtzblatt. 1998. *Contextual design: defining customer-centered systems*. Morgan Kaufmann, San Francisco, California.
2. Susanne Bødker. 2000. Scenarios in user-centred design - setting the stage for reflection and action. *Interacting with Computers* 13, 1: 61–75.  
[http://doi.org/10.1016/S0953-5438\(00\)00024-2](http://doi.org/10.1016/S0953-5438(00)00024-2)
3. John D. Gould and Clayton Lewis. 1985. Designing for usability: Key principles and what designers think. *Communications of the ACM* 28, 300–311.  
<http://doi.org/10.1145/3166.3170>
4. International Organization for Standardization. 2010. *Ergonomics of human-system interaction -- Human-centred design for interactive systems (ISO 9241-210:2010)*. Retrieved from <https://www.iso.org/standard/52075.html>
5. James R. Lewis. 1993. IBM computer usability satisfaction questionnaires: Psychometric evaluation and instructions for use. *International Journal of Human-Computer Interaction* 7, 1: 57–78. <http://doi.org/10.1080/10447319509526110>
6. Yvonne Rogers, Jenny Preece, and Helen Sharp. 2011. *Interaction design: Beyond human-computer interaction*. John Wiley & Sons Ltd, Chichester, England.
7. Todd Zaki Warfel. 2009. *Prototyping : A practitioner's guide*. Rosenfeld Media, Brooklyn, New York.
8. Method: I Like, I Wish, What if. *The Hasso Plattner Institute of Design at Stanford - d.school*. Retrieved May 27, 2018 from <https://dschool-old.stanford.edu/wp-content/themes/dschool/method-cards/i-like-i-wish-what-if.pdf%0A>
9. I Like, I Wish, What If. *Interaction Design Foundation*. Retrieved May 27, 2018 from <https://public-media.interaction-design.org/pdf/I-Like-I-Wish-What-If.pdf>