



Project HnnH

Deliverable D1.1

Matchmaking Parameterset and User Survey

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1 Deliverable Overview

The objective of WP1 is to involve relevant ecosystem stakeholders and primary end-users (older people) in co-creating the platform requirements in an iterative fashion, based on their needs. Selected topics will be discussed on expert levels and connected to the co-creation results. WP1 will be related to all relevant technological parts of the HannaH system (hardware [smart speaker, smartphone app], AI-based matchmaking, user experience) as well as ethical principles and proof of concept scenarios as a base for future anchoring processes. The tasks are underpinned by principles of iterative User-Centred Design approaches and ethical guidance related to good practice in user involvement (two-fold informed consenting process, transparent user information concerning relevant results, data privacy, research exit strategy). In all tasks a clear process of informing (2 step) and consenting is implemented. Informed consent documents are based on standards in related AAL projects and ethical committee guidelines.

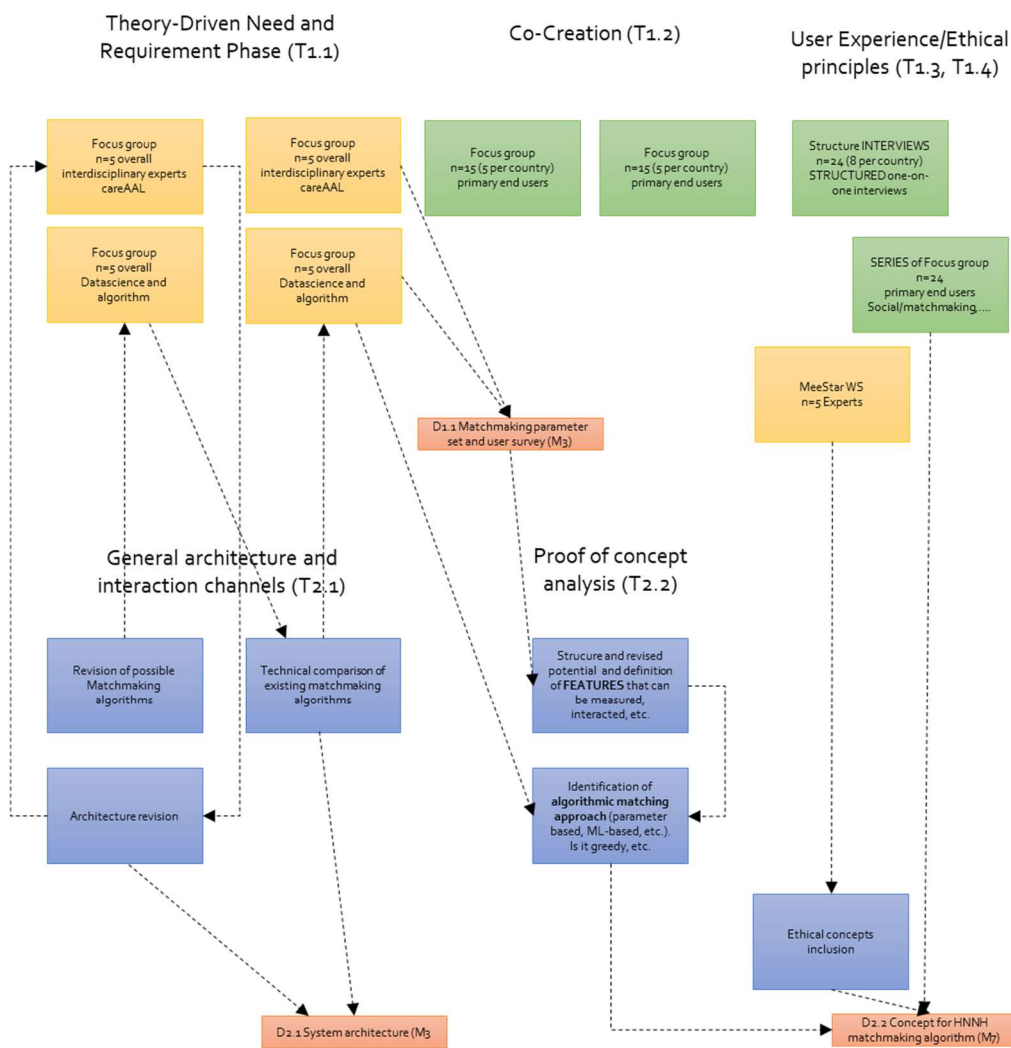


Figure 1: Overview on HnnH D2.2 relation to content creation

The deliverable D1.1 mirrors the results of HnnH tasks T1.1. In addition it realizes the identification of features and estimation of decision potential as well as a revised estimation of data structures. The analysis will always be guided by an ethical revision and iterative discussion related to privacy, security and democratic challenges related to automated decision making in T1.4. It is related to the HnnH deliverable D1.1 and D2.1 (see also Figure 1)

The extended purpose of this deliverable is to examine existing matching algorithms and the fields of application to find suitable ones for social matching of seniors depending on different parameters. Definition of parameters important for social connection of elderly people is another goal of this project.

2 Overview on the requirements related to Primary end users (seniors)

In order to collect information about primary end users' needs and preferences, the HnnH project team planned to conduct two rounds of focus groups in each of the participating countries. The target group size for every discussion was n=5 and thus, in total, 30 primary end users were to be interviewed in the scope of two rounds of focus groups in three countries. In the end, the project team was able to recruit 33 seniors to participate in the focus groups. [Figure 2](#) shows a detailed breakdown of end user focus groups per country.

As an addition to the focus group discussions, each country team was also tasked with conducting 8 one-on-one interviews with primary end users. Here the aim was to talk to 8 seniors per country, i.e., 24 people overall. Because all focus group participants were very eager to continue contributing to the project, they were included in the pool of potential interview candidates and additional candidates were recruited. Unfortunately, recruitment and subsequent interview scheduling proved exceedingly difficult because of people's unavailability due to the summer holidays. As a result, the country teams of the Netherlands and Austria were only able to conduct a total of 12 interviews, but these already brought research very close to the point of theoretical saturation, as the last few interviews yielded no vital new information. [Figure 2](#) shows a detailed breakdown of end user interviews per country.

Included in the [appendix](#) are the two focus group protocols as well as the interview guideline, with the inclusion and exclusion criteria for potential participants.



Figure 2: Breakdown of HannaH end user focus groups and interviews

3 General requirements related to the input of AAL and care experts

In addition to focus groups and interviews with primary end users, the project team also sought out the expertise and opinions of people with professional experience in both the field of AAL and the field of care. The plan was to carry out 2 focus groups with 5 experts from various countries (the same experts in both groups) with CUAS from Austria conducting the discussions. The project consortium put together a list of potential candidates: 2 experts from Austria, 2 experts from the Netherlands and 1 expert from Norway. Due to great difficulties with people's availability, the first focus group was attended by only 3 of the experts. In several follow-ups, the remaining experts were asked to provide written answers to the questions that had been discussed in the focus group, but none replied. In order to make it easier for experts to participate, the second focus group was then changed in format from a discussion meeting to a written interview. Even after several friendly reminders, only 2 experts were able to provide written statements. [Figure 3](#) shows a breakdown of the focus groups with AAL and care experts.

Included in the appendix are the focus group protocol and the written interview questions, with the inclusion and exclusion criteria for potential participants.



Figure 3: Breakdown of HannaH expert focus groups

4 Proposed HnnH parameter set

A detailed overview on the whole Co-creation process as well as the basic results on general approach of HnnH, security and privacy aspects as well as use-case ideas and ethical analysis results can be found in HnnH deliverable D1.2. The parameters in the following are derived from these results. Concerning the HnnH approach and the described algorithmic approaches (confident deliverable D1.2) a first preselection of algorithms in relation to implement-ability, proposed usage scenarios and social matching abilities is given in the following. An implicit matching approach is favored, whereas user-item matching as well as entity relation matching scenarios would be useable. In relation to this the following general parameter definition was derived as well as a prioritized and analysis-based set.

4.1 General definition of parameters

Definition of parameters plays important role in correct interpretation of the results of algorithm. Based on the demand of the HnnH project two categories of parameters should be chosen. In the following examples for the four categories are given – which also correspond to the discussions in the user involvement process of HnnH WP1:

Table 1: Overview on different relevant parameter for the HnnH matchmaking process

Fixed parameters	Demographic parameters and fixed descriptive and objective parameters, mainly direct input in the registration process
Dynamic subjective parameters	Personal, subjective interest, Short-term and Mid-term interests, input via different UI channels possible, keyboard, speech recognition, user specific UIs
Dynamic and automated derived parameters	Personal parameters derived automatically from UI sources (e.g. emotional state, health state, interest analysis, etc.)
Escalation parameters	Extended form of subjective direct input as well as automatically derived parameters, that are related to an emergency or escalation situation and trigger direct contact to professional support (medical or psychological)

4.2 Examples for the corresponding parameters:

Fixed parameters

- Age,sex, marital status, Religion, Living location
- Education level, Living arrangement(alone, with partner, adult child), Car ownership, Time living in neighborhood
- Phone/Social Media, Pet
- Hobby

Dynamic subjective parameters

- Actual interests

- Discussion topics
- Migration, House working, Income
- Diet, Physical activity,
- Detailed hobby interests

Dynamic and automated derived parameters

- Emotional states
- Mental Health
- Physical Health

In the HnnH project extended and holistic user participation was performed in order to figure out on the hand how social matching could work for the proposed user groups and which parameters could be used to identify matches. In general a mixed set of parameters (variables in terms of algorithmic implementation) were identified, which fit to the definition of fixed and dynamic variables. These parameters are all related to inputs performed via the HnnH UI. Some (especially the static ones) can be defined via classical inputs (keyboard). On the other hand dynamic parameters will be included mainly via the novel HnnH Speaker User Interface. In the following we present a set of discussed and agreed parameters for the social matchmaking algorithm in the HnnH project subdivided into fixed, dynamic and additional parameters for emotional state detection and matching.

4.3 Fixed parameters

Fixed parameters do not change very often or even at all. They are entered by users maybe just once, e.g., when first joining HannaH, but can be modified later on if need be. Focus groups and interviews with primary end users as well as AAL and care experts resulted in the following list of parameter requirements (in no particular order):

- **Name:** Full name or first name only
- **Age:** Maybe in broader age groups, and maybe HannaH could ask users if other people's age is important to them when matching conversation partners.
- **Gender**
- **Region of residence:** More detailed information (e.g. town, city) should be optional only.
- **Interests/hobbies:** e.g. reading, travelling, knitting, cooking, sports
- **Language skills:** This is relevant if connections to people from other countries are an option. If this is not an option, asking for users' language skills is not necessary.
- **(Former) occupation:** This should be optional or can be omitted completely.
- **Family:** This should be optional or can be omitted completely.
- **Living situation:** This should be optional or can be omitted completely.
- **Mobility restrictions:** This should be optional or can be omitted completely.

4.4 Dynamic parameters

Dynamic parameters represent users' current interests and can be updated daily. They signal what users want to talk about in the conversation that is about to be initiated by HannaH. Focus groups and interviews with primary end users as well as AAL and care experts resulted in the following list of parameter requirements (in no particular order):

- **Activities:** e.g. cooking, gardening, DIY
- **Current events:** e.g. local events, international sports events
- **Current news:** e.g. newspaper stories
- **Arts and culture:** e.g. movies, exhibitions
- **Life events:** e.g. retirement, birth of a grandchild
- **Travels**
- **New in town:** People who have recently moved to a new region/town/city may want to talk to people who have been living there for longer.
- **Meet-ups:** Some people may want to arrange meetings, e.g., to go for a walk or visit a museum.

4.5 Parameters to detect emotional states

Parameters to detect emotional states aim to recognise users' emotional state or health status by analysing, e.g., people's tone of voice or speaking tempo. Focus groups and interviews with primary end users as well as AAL and care experts revealed that this function is not welcome at all. The following list of statements in response to the question if people would want to share their emotional state with HannaH or would want HannaH to recognise their emotional state on its own emphasises, in particular, primary end users' disapproval:

- No, I want to share my emotional state with humans.
- No, because HannaH should never try to replace a human.
- No, this is overstepping boundaries.
- No, because HannaH can misunderstand me and draw the wrong conclusions, which would make me feel hurt.

Two further statements also explore the topic of sharing your emotions with HannaH:

- Boredom or anger could be shared with HannaH because it is important to communicate. HannaH then takes on the role of mediator and could suggest who to talk to, so people would not share their emotional state with HannaH but with another person.
- But sadness, for example, is another story. What if HannaH doesn't find anyone the person could talk to? Are they then connected to a professional helpline, especially in extreme cases? HannaH is not a first aider. A clear explanation is needed right at the start – by a real person – what HannaH can and cannot provide.

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