



SIGNON

## **Sign Language Translation Mobile Application and Open Communications Framework**

**Deliverable 1.5: Interim Community Building Report**



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**Overview:** This report will provide a current overview of our initiatives to build out our community with co-creation events, detailing the co-creation events we carry out. Other avenues of community building are also explored, such as the use of our social media channels and the building of a scientific community.

**Revision History**

Version #	Implemented by	Revision Date	Description of changes
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V0.2	EUD	04/05/2022	Second draft with input from partners
V0.3	EUD	10/06/2022	Draft for final reviewing
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### Approval Procedure

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## Acronyms

The following table provides definitions for acronyms and terms relevant to this document.

Acronym	Definition
DoA	Description of the Action (Annex 1 to the Grant Agreement)
ISL	Irish Sign Language
LSE	Lengua de Signos Española (Spanish Sign Language)
MEP	Member of the European Parliament
NGT	Nederlandse Gebarentaal (Sign Language of the Netherlands)
UI/UX	User Interface/User Experience
VGT	Vlaamse Gebarentaal (Flemish Sign Language)

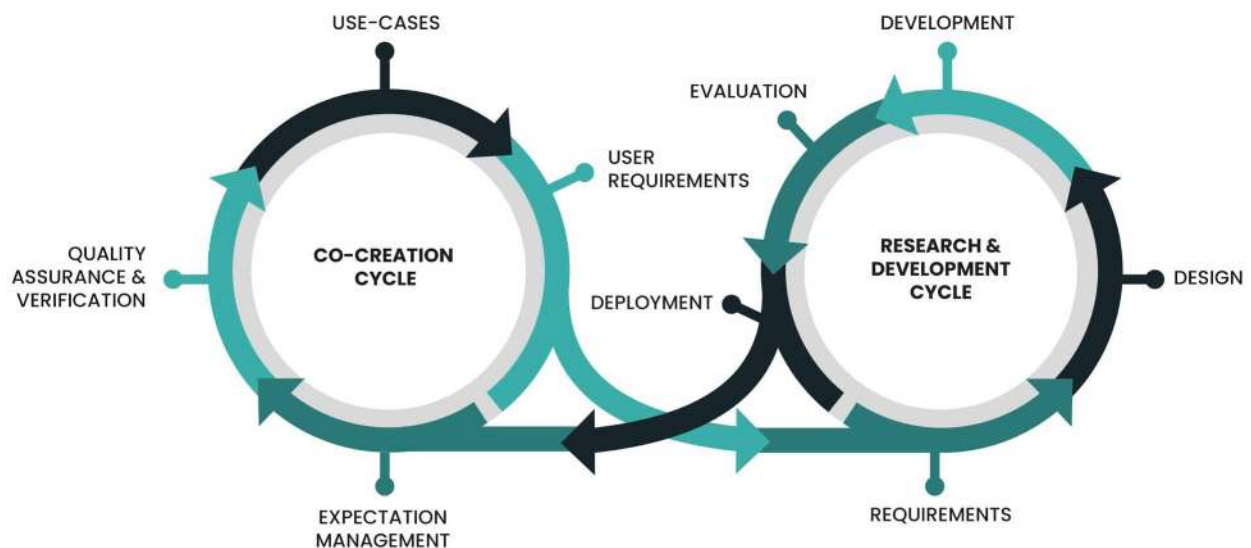
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## 1. A community to co-create

SignON aims to reduce the gap between the stakeholder communities through a user-centred and community-driven research and development approach, involving stakeholder-led user profiles from its inception. Our methodology revolves around a co-creation workflow – a constant exchange of information and ideas between the user community and technical experts – which is guided by (sign) language and/or deaf community experts.



Within this co-creation strategy, we collaborate tightly with European deaf and hard of hearing communities to iteratively (re)define use cases, co-design and co-develop the SignON service and application, assess the quality and validate user acceptance. Elements of the research and development cycle that will heavily be influenced by the co-creation workflow are the user requirements, the UI/UX design, the use cases and the user evaluations.

To maximise the potential of the co-creation workflow, we need to expand our community of stakeholders. The SignON community building strategy consists of three major areas: (1) co-creation events within the SignON project, (2) community building through social media, and (3) scientific community building. With an ongoing feedback loop from deaf, hard of hearing, and hearing



stakeholders back to the consortium, we ensure that user responses are woven into the ongoing plans for the project, that expectations are met and that issues related to diversity and bias are explicitly addressed. Together with the users, we explore new and redefine old use-cases supported by the SignON service. Thus, the user is proactively involved in the evolution of the SignON project.

In this deliverable we elaborate further on each one of the three areas of community building within this project.

## 2. Co-creation events within the SignON project

Through a series of co-creation events, we engage with stakeholders and showcase the progress of the SignON project to reach the specific objectives of each WP, aiming to enlarge the active-user community. Within Task 1.5 (Building a bias-free community within and outside the SignON project), we steer the communities towards the execution of T1.2 to define the end-user scenarios and use-cases and towards T1.3 to obtain the end-user requirements. Within this task, we also get the user groups for the UX design process and user testing (T1.4). We focus on eliminating bias and gathering representatives from stakeholder communities regardless of gender, ethnicity, religion, etc.

We identify several categories of co-creation events to be carried out within the SignON project: (1) interviews (either individually or in focus groups), (2) round tables, (3) workshops and (4) surveys. For all of these events, research ethics approval is secured in advance under the auspices of DCU, our project coordinator with supplementary ethics approvals secured in partner institutions as required.

### 2.1. Interviews

#### 2.1.1. *Definition of interview*

According to the SignON project proposal, the definition of an interview is the following:

*An online or a face-to-face semi-structured dialog with individuals or groups of users. Duration no longer than two hours.*

#### 2.1.2. *Data collection during interviews*

The SignON researchers focus specifically on sampling deaf, signing participants for these focus groups (or, with deafblind participants, one-on-one meetings if needed). Potential participants are invited to the focus groups, with an invitation letter containing an informed consent form that provides information about a) the project and the focus group, b) possible benefits and disadvantages, c) confidentiality and d) their rights.

With the question grid prepared beforehand, the SignON researchers engage freely with the participants in a video meeting for no more than two hours, through Zoom if social distancing requirements apply,

where the opinions of the participants are asked. If there are no social distancing requirements, the meeting can take place physically. It is important to keep the discussion flowing; as such, the SignON researchers use a semi-structured focus group approach, instead of a ‘formal’ interview. Focus group participants are invited to a group using a sign language that they are most comfortable with: Irish Sign Language, British Sign Language, *Nederlandse Gebarentaal*, *Vlaamse Gebarentaal* and *Lengua de Signos Española*, or using International Sign. This opens up opportunities for participants from Ireland, the United Kingdom, the Netherlands, Flanders (Belgium), Spain and across Europe to engage in a sign language led discussion about key concerns, views, and beliefs about machine translation as it pertains to sign language users.

The moderator makes sure that all participants are able to share their ideas on an equal level. Due to the informed consent form, all participants know that the answers they give can be used anonymously further on in the project, removing any fears about possible identification and the possible consequences thereof. This way, we can ensure that they answer freely and give their honest opinions.

Sometimes participants are not able to join the focus groups as their schedules do not allow this or because of special needs, such as deafblindness or age. Older people may be ‘intimidated’ by the knowledge of younger generations and may hesitate to share their own opinions. For these people, we set up one-on-one interviews in a semi-structured way. That is, we use the same questions as in the focus groups and, like in the focus groups, we also allow ourselves to ask additional questions or allow the participant to elaborate a bit more on a certain idea and so on. This way, the answers become more detailed, which is very important in order to get a good overview of what the average future user of the app requires. The moderator always adds some views from other participants that were collected during the focus group interviews, to ask the opinion of the participant about these views, building iteratively on learning as we proceed. This way we are able to collect a wide range of answers and more detailed/outspoken reactions and opinions, even during the individual interviews.

These interviews are video recorded to facilitate post-hoc transcription, anonymisation, and thematic analysis. After the meetings, focus group leads prepare an anonymised transcript of the interviews in English. This anonymised dataset is then shared with colleagues from the SignON consortium for thematic analysis.

### **2.1.3. Flanders, Belgium**

The EUD researchers approached prospective participants to gauge their interest. The participants were then officially invited to the focus groups with an invitation letter containing an informed consent form. The interviews were held in *Vlaamse Gebarentaal* (VGT), as the EUD researchers were able to communicate directly in this language, minimising any possible communication barriers.

Five deaf participants were invited to participate in the focus groups, based on the following criteria:

1. Being able to communicate fluently in VGT, the sign language that would be used in the interview
2. Attention to gender and age balance<sup>1</sup>

We organised several interviews through Zoom, either with multiple participants or with just a single participant, in order to accommodate special needs. In total we held four interviews in VGT, with a total duration of just under five hours of recorded material.

### **2.1.4. Spain**

The EUD researchers approached prospective participants to gauge their interest. The participants were then officially invited to the focus groups with an invitation letter containing an informed consent form. The interviews were held in *Lengua de Signos Española* (LSE), as the EUD researchers were able to communicate directly in this language, minimising any possible communication barriers.

Five deaf participants were invited to participate in the focus groups, based on the following criteria:

1. Being able to communicate fluently in LSE, the sign language that would be used in the interview
2. Attention to gender and age balance

We organised several interviews through Zoom, either with multiple participants or with just a single participant. In total we held three interviews in LSE, with a total duration of a little over three hours of recorded material.

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<sup>1</sup> See Section 2.1.8 for discussion of special attention to participant diversity planned for future focus groups.

### **2.1.5. Ireland**

The TCD researchers approached prospective hard-of-hearing and deaf participants to gauge their interest in participating in a focus group for their respective cohort. The participants were then officially invited to the focus groups with an invitation letter containing an informed consent form.

The focus group interview with the deaf participants was held in Irish Sign Language (ISL). This focus group was not interpreted as the TCD researchers were able to communicate directly in this language (one deaf native signer and one hearing fluent signer). The focus group interview with the hard-of-hearing participants was held through English.

Four deaf participants were successfully invited to the focus group, based on the following criteria:

1. Being able to communicate fluently in ISL, the sign language that would be used in the interview.
2. Attention to gender and age balance.

Three hard-of-hearing participants were successfully invited to the focus group. While there was a balance of ages, all of the participants in this focus group were women. The TCD researchers have strong ties to the Irish Deaf Community, however it was more challenging to source hard-of-hearing participants, and the lack of gender variation in this focus group is due to this.

We organised focus groups through Zoom, both with multiple participants, with the hard-of-hearing and deaf cohorts respectively. In total we held two focus groups, one through English and one through ISL, with a total duration of just over two hours of recorded material and with 7 participants in total: four participants in the deaf focus group and three participants in the hard-of-hearing focus group.

### **2.1.6. The Netherlands**

There are no deaf NGT signers in the Consortium, so in the interest of minimising communication barriers, it was decided within WP1 that we needed to collaborate with an external deaf organisation for the focus group interviews in the Netherlands. The organisation we collaborated with is the *Nederlands Gebarententrum* (the Dutch Sign Language Centre), through their contacts with our partners, the VGTC (the Flemish Sign Language Centre) and TaalUnie. This collaboration bore fruit with a focus group that

physically took place on 26 April 2022.

Six deaf participants were invited to participate in the focus groups, based on the following criteria:

1. Being able to communicate fluently in NGT, the sign language that would be used in the interview
2. Attention to gender and age balance

### **2.1.7. About the participants**

To ensure a diverse and heterogeneous group of participants, we invited people from different ages and genders, which resulted in a group of twenty-three participants. To give an idea of the profile of the different participants:

- The participants were primarily deaf sign language users from Spain, Flanders (Belgium), Ireland, and the Netherlands. One focus group was held through English with Irish hard-of-hearing individuals.
- The youngest participant was 23 years old, the oldest 75.
- The average age of the participants is 41 years old.
- Of the twenty-three participants, twelve are women, and eleven are men. No one identified as non-binary.
- One more interview with another female (24th) participant was not conducted due to scheduling conflicts.
- Two participants were deafblind.
- Three participants were hard of hearing.

This group ensured a large variety of different opinions and ideas from the deaf community concerning the use of a new avatar-based translation app, which makes sure that we get a good view of what the user requirements should consist of.

### **2.1.8. Current status of planned focus groups**

In order to explicitly address issues around diversity and bias, we also need to look at diversity in the deaf community and include the perspectives of everyone, regardless of gender, ethnicity, age, religion, etc. We have to pursue efforts towards reaching the minorities within the deaf community.

Thus far, focus group participants have been selected to achieve balance in gender and age, however there are various other dimensions of diversity that have not yet been systematically included in participant recruitment. In previous focus groups, participants pointed out that avatars should be customisable with respect to skin colour, facial features, and clothing to better reflect preferences of a diverse user base. To ensure that these dimensions are well explored, EUD is in the process of setting up focus groups that specifically target minority populations within European deaf communities. This will allow us to create an application and service that is more inclusive and adaptable to users of different backgrounds.

Another minority in the deaf community that should not be forgotten about are the deafblind. Deafblind is a term used to refer to individuals with a combination of hearing and vision loss. The term includes a wide spectrum and often encompasses individuals who are not both totally deaf and totally blind. Individual preferences for communication are diverse and vary based on degree of sensory loss and other individual circumstances. They can include visual sign language (in this case the SignON application could be of use to them as well), tactile sign language, speech, and Braille. A deafblind person was involved in the focus group interviews, but the way the SignON app and service can specifically be accessible to deafblind persons was not very deeply discussed. How do we optimise the visibility of the avatar for deafblind people, considering that their needs can also be very different from individual to individual? What customisation options should there be? EUD will be organising interviews with deafblind persons to discuss accessibility within the SignON project, app and service.

## **2.2. Round tables**

### ***2.2.1. Definition of round table***

According to the SignON project proposal, the definition of a round table is the following:

*A one-day event focused on a specific technical, scientific or social feature of SignON (e.g. the user interface). The event will include demonstrations and discussions.*

### ***2.2.2. Data collection during round tables***

With the topics and/or use-cases prepared beforehand, the SignON researchers engage with the participants during a physical event. The objective of this co-creation event is to enlighten the participants about the finer details behind the scenes of sign language machine translation and to collect their opinions and perspectives on the discussed topics.

Roundtables are video-recorded to facilitate post-hoc transcription, anonymisation, and analysis. After the meetings, roundtable organisers prepare an anonymised summary of the data in English. This anonymised dataset is then shared with SignON colleagues for analysis, reports and deliverables.

### ***2.2.3. EUD General Assembly***

The General Assembly of the European Union of the Deaf is an annual event for EUD's member countries where deaf representatives from the national associations of the deaf from all the 27 EU countries, 3 EFTA countries (Iceland, Norway, and Switzerland), and the United Kingdom are present. This General Assembly also goes paired with workshops and presentations for the deaf representatives.

SignON was planning to hold one of those events on 26th May 2022, during the EUD General Assembly in Marseille, France, in cooperation with its sister project EASIER, to present, demonstrate and discuss different aspects of sign language machine translation projects and the challenges to overcome. The objective of this event was to share information about these two Horizon 2020 funded projects with the representatives of EUD's member countries about the finer details behind the scenes of sign language machine translation projects. Topics such as sign language annotation, the challenges with data for



low-resource languages, co-creation and the technical aspects for getting a good-quality sign language output through an avatar were to be discussed and opinions from the deaf representatives were to be gathered.

Unfortunately, due to some unforeseen circumstances around the availability of International Sign interpreters to interpret the presentations of some of the hearing non-signing project partners, we were forced to postpone the planned roundtable to the next EUD General Assembly (Sweden, 2023). Instead of the planned roundtable, the EUD staff working on the project held a presentation to explain a bit more about the project we are working on, without many interactive elements. This presentation was well received by the audience of 71 delegates to the General Assembly.

#### ***2.2.4. Current status of planned round tables***

As specified in the project proposal, we plan to carry out four in-person roundtable events. Given the recent loosening of COVID restrictions across Europe, we are currently in the organising stage of these roundtables. Three roundtables are planned to take place with local partners (one in the Netherlands, one in Spain and one in Ireland) and one is planned to take place during the next EUD General Assembly in Sweden in 2023. At present, preparations have begun for the first roundtable, due to take place in The Hague, the Netherlands in the autumn of 2022.

### **2.3. Workshops**

#### ***2.3.1. Definition of workshop***

According to the SignON project proposal, the definition of a workshop is the following:

*A two-day event presenting the current development of SignON and discussing the next research & development cycle. The event will include presentations and panel discussions.*

### **2.3.2. Data collection during workshops**

Workshops are video-recorded to facilitate post-hoc transcription, anonymisation, and analysis. After the meetings, the workshop organisers prepare an anonymised summary of the data in English. This anonymised dataset is then shared with SignON colleagues for analysis, reports, and deliverables.

### **2.3.3. Current status of planned workshops**

Due to the restrictions in the context of the COVID-19 pandemic, we have not yet been able to organise workshops for the SignON project. However, we are in the process of preparing for our first workshop in Ireland in autumn 2022, together with our Irish partners. The second workshop is planned to take place in Belgium in 2023, in collaboration between the Flemish partners and EUD.

The preparations for the workshop in Dublin are ongoing, with the current idea being to follow the format of the ADAPT Centre’s “Citizen Think-In” events (<https://thinkins.adaptcentre.ie/what-is-a-think-in/>). This model has earlier proven successful in the ADAPT Centre, and we believe it provides a good opportunity to form a basis for the Irish co-creation workshop.

## **2.4. Surveys**

### **2.4.1. Definition of surveys**

According to the SignON project proposal, the definition of a survey is the following:

*An evaluation form containing a questionnaire about the quality of SignON, its performance and features (current and expected). The form will be presented and completed online. The anticipated duration is 15-20 minutes.*

### **2.4.2. Data collection during surveys**

In 2022, KU Leuven (KUL), with the assistance of the Flemish Sign Language Centre (VGTC), developed an online survey to collect feedback from deaf, hard of hearing and hearing potential end users of the

SignON App. This survey is currently in the process of being translated into all the sign languages which are involved in the project.

The main goal of this survey was to identify to what extent potential end users would be willing to use (or not use) the SignON app in 15 proposed use case settings. The results of this survey will help guide the SignON consortium to (re)define use case settings and adopt new ones, in order to meet the user's needs and requirements in the best possible way.

As everyone (i.e. every deaf, hard of hearing and hearing person) is a potential end user of the SignON App and as it is not for the researchers to determine the hearing status of someone, it was decided to create one single version of the survey instead of a separate survey for each of the different user communities as defined in the project proposal (i.e. deaf, hard of hearing and hearing people). In this single version, all the information and questions could be consulted both in sign language and written language. Guidance was sought from a student with expertise in UX design.

The survey consists of four parts which questioned people about their:

- linguistic background;
- experience with different translation tools and software;
- willingness to use the SignON App in the 15 proposed use case settings;
- gender, age and hearing status.

The 15 proposed use case settings of the SignON app were selected based on extensive literature research as well as discussions with the Flemish Sign Language Centre and other stakeholders. The set of 15 includes the four use cases suggested in the SignON project proposal and ranges across three thematic domains: professional, private, and educational.

For practical reasons and privacy issues, the software Qualtrics was used to construct and design the survey. Participants could choose to view the questions in sign language and/or read them in the written language.

Q2.



Welke taal (talen) gebruik je in werksituaties?  
Je kan meerdere antwoorden aanklikken.

<input type="checkbox"/> Vlaamse Gebarentaal (VGT)
<input type="checkbox"/> International Sign
<input type="checkbox"/> Nederlands
<input type="checkbox"/> Frans
<input type="checkbox"/> Engels
<input type="checkbox"/> niet van toepassing
andere: <input type="text"/>

Before participants could start to answer the survey questions, they were informed about the GDPR and the privacy policy for the respective institution and the SignON consortium. In case participants did not consent to this policy, the survey was terminated without further possibility to see and answer the questions. Apart from this one question related to the privacy policy which required a response, all other questions were optional.

### **2.4.3. VGT/Dutch (KU Leuven)**

The survey was launched at the beginning of April 2022 and closed at the end of that month. The link to the online survey and an accompanying informative video in Flemish Sign Language and text in written Dutch was distributed by e-mail amongst different stakeholder organisations and individuals and through

the social media channels of the SignON project, the Flemish Sign Language Centre (VGTC) and *Doof Vlaanderen* (the Flemish National Association of the Deaf).

In total, 259 respondents reacted to the online survey. These 259 reactions included complete as well as incomplete reactions. Of all participants, 119 of them filled in the question relating to hearing status. 68 participants identified themselves as hearing, 36 as deaf, 8 as hard of hearing, 4 as 'other', 2 as deafblind and 1 person indicated the option of preferring not to answer this question.

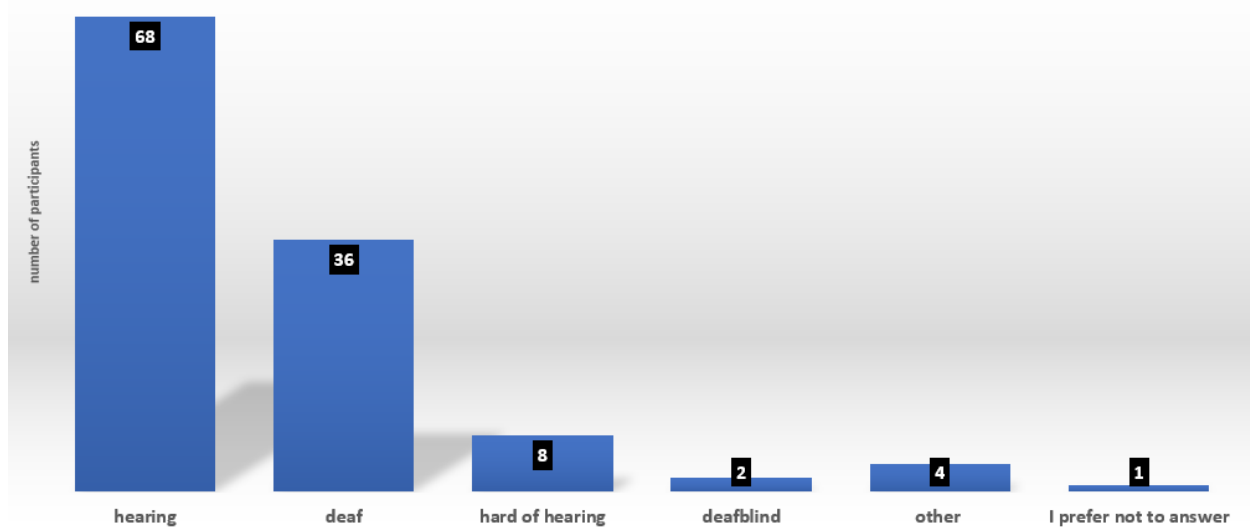


Figure 1: Question 14: Are you...deaf, deafblind, hard of hearing, hearing, I prefer not to answer the question, other

Preliminary results show that there are some similarities between the most preferred and least preferred use case settings of the different groups of potential end users. The table below illustrates the three most popular (green **V**) and least popular (red **X**) use case settings of deaf, hard of hearing and hearing respondents based on this first analysis (in case a fourth use case setting had the same rate as the third most or least preferred use case setting, this fourth one was also included in the table).

	deaf	hard of hearing	hearing
#3: general communication in everyday life	V		V
#4: private communication in everyday life			V
#6: translate online content		V	V
#7: contacting and communicating with emergency services	V	V	
#8: anonymous videos in VGT and other SLs	X	X	X
#9: learning new languages	X		X
#11: communication during formal moments		V	
#12: communication during informal moments		X	
#13: communication in public places	V	V	
#14: news on tv in VGT	X	X	X
#15: crisis communication on tv in VGT	X	X	

A detailed presentation of the results will be included in D1.2 (due September 2023).

#### **2.4.4. NGT, LSE, ISL and BSL**

The VGT/Dutch version of the survey developed by KU Leuven will serve as the base for the surveys in the other sign languages of the project. The Dutch version is also to be translated in English and Spanish, the versions in these three languages will then form the basis for the translations in NGT, LSE, ISL and BSL through VGTC's pool of deaf national sign language translators.

These local versions of the surveys will then be carried out by the respective local partners in collaboration with EUD. The results will be included in D1.2 (due September 2023), along with the VGT survey results.

## **2.5. App testing**

### **2.5.1. MAC surveys**

During May/June 2021, the SignON Partners and their users installed, reviewed and provided structured evaluation feedback through the cognitive walkthrough method on the initial SignON mobile app fast prototype on their own Android phones. As described in D1.4 “First Technical Requirements & User Research (UX design) Report” an online form which asked users to undertake seven tasks with the fast prototype SignON app and record any problems they encountered. The survey asked each person to answer some questions on the app’s system usability and their overall feedback. The initial SignON app authorised testing group consisted of 24 users, and 12 feedback walkthroughs were completed.

Their overall feedback was generally positive. The partners’ users understood that this was just the first step, but they agreed that the app had the right look and feel, and was on the right track of what users need and want. Participants agreed that text and speech translations were well on the way, however they noted that sign language translation functions, which were not yet implemented in the prototype being tested, should be implemented as soon as possible, with equally high quality<sup>2</sup>. The users’ System Usability Scale (SUS) rating for the SignON mobile app at 80 overall was well above the SUS threshold of acceptability of 68. This high rating appears to reflect the high satisfaction with the speech and text functions of the prototype, however follow up ratings will be necessary to determine usability of sign language functions.

The users indicated that they expected their main use of the app would be:

- Work-related.
- Translating from another sign language than the one they know.
- Sign language machine translation.
- Spoken language to written text/sign language.

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<sup>2</sup> It should be noted that as Sign Language Machine Translation (SLMT) is a relatively young field compared to written language MT, it is more challenging and there is far less data as of yet. So the project will need to carefully manage users’ expectations of the SignON Mobile App.

- Meetings on work, specific situations in private life such as asking for an explanation or placing an order.
- To interact with their hearing friends and colleagues.
- To communicate with deaf people and vice versa.
- Translation. Learning sign language.
- To understand and talk to deaf people who communicate with sign language.
- Translate from speech to sign language.

These were in line with the SignON mobile app’s objectives and expectations in the DoA.

A second round of testing the SignON app v1.0 took place in the spring of 2022. The results of this survey can be found in D1.9, the Second Technical User Requirements and User Research (UX Design) Report, due in June 2022 as well.

## **2.6. Presentations**

### **2.6.1. VGTC event**

As part of our communication and dissemination plan, we have to enter into dialogue with potential users, representatives and organisations. Because of the COVID-19 regulations that impede the social gathering of deaf and hard of hearing people, it was not easy to achieve this goal. On 20th November 2021 VGTC organised a workshop entitled “Language police or not?”. We took the opportunity to give a short presentation about the SignON project to about one hundred Flemish VGT signers, followed by a Q&A session. This raised interest among the audience and there were several positive reactions, but some were concerned about the SignON project and its objectives. We noted their concerns and questions and based on this we updated the FAQ page on our website (<https://signon-project.eu/about-signon/faqs/>).

### **2.6.2. Interparliamentary Commission of the Dutch Language Union**

On the 16th of May 2022 there was a session of the Interparliamentary Commission of the Dutch Language Union (TaalUnie) in the Flemish Parliament. This is an institution comprising members of the



Dutch and Flemish Parliaments, that focuses on issues regarding the Dutch language.

Jorn Rijckaert (VGTC) gave a presentation of our work on the SignON project to this commission and Catia Cucchiarini (TaalUnie) emphasised the importance of research on the Dutch and Flemish sign languages (and language technologies) to ensure accessibility for deaf people.

### ***2.6.3. European Parliament***

In collaboration with the deaf MEP, Ádám Kósa, who is part of the Advisory Board of the SignON project, we are planning to hold a two-hour workshop to present our project at the European Parliament in Brussels on the 28th of September 2022.

## **2.7. Ethical considerations and data management**

In order to host co-creation events, the partner organisations received ethical approvals from the relevant ethical committees. Every participant received an informed consent form, which provided more information about what would happen with their (personal) data and what could be expected from the co-creation event. Participants were informed both via the form and by the organisers at the beginning of each co-creation event that by participating in the event they were agreeing to give their informed consent.

After co-creation events were concluded, only the researchers who were appointed to the specific co-creation event were allowed to watch the recordings, to access the answers to the surveys or to access the collected personal data. In the case of recorded focus group interviews, round tables and workshops, they transcribed all the discussions, questions and answers from the participants. All data was then anonymised and compiled into a report for the SignON partners.

### 3. Community building through social media

Social media strategy plays a huge part in community building. As part of our communication and dissemination plan we have launched the website and several social media channels: Facebook, Twitter, LinkedIn and Instagram. To provide transparency in the structure and operations of the SignON project, we collected and presented the essential information about the project on our website with translation videos in International Sign. Because it is important to us that everyone can contact us in their own preferred language, on the contact page of our website, visitors can choose between written form or video message (the camera of the device opening the page turns on automatically and deaf signers can record themselves in their sign language).

News and updates of our project are posted in every social media channel and provided with a video translation in International Sign. In addition to these posts, we also launched three video series:

- SignON Encyclopedia: aims to cover various topics related to the deaf communities, sign language and the SignON project, such as machine translation systems between spoken languages and sign languages and sign language avatars. These videos not only aim to raise awareness about the deaf communities and sign languages, but also explain the SignON project and its objectives. So far eight videos have been posted.
- SignON Forum: we strongly believe in maintaining a constant dialogue with our target audiences. That is why we have launched a new video series where we invite everyone to share their questions, concerns, comments or ideas with us. So far one video has been posted.
- SignON Interviews: where we interview the experts in our consortium, as well as external experts such as (deaf) academics, about topics related to the SignON project. So far two videos have been posted.

Even though the targets to be achieved are very ambitious, we still record a relatively low number of followers on social media, despite our weekly posts (with different periods of holiday breaks). We suspect this level of engagement is because sign language technologies are still a very new issue for deaf communities, however it should be noted that we are doing significantly better than other sign language technologies projects in Europe:

Channel	Measure	Project target	First year
Project website	# site visits	6,000 during the project lifecycle	3700 site visits
Facebook	# followers	10,000 during the project lifecycle	498 followers
Twitter			331 followers
LinkedIn			93 followers
Instagram			138 followers

We also have started a quarterly newsletter, with two issues sent out so far. The number of subscribers is currently 38 (of 200 which is the project target).

In addition to actively recruiting end-users for testing ourselves, our website (<https://signon-project.eu/co-creation/i-want-to-join/>) also offers potential end-users the opportunity to sign up as participants for focus groups and interviews, in this way it contributes to passive community building.

## 4. Scientific community building

The SignON project is made up of a large consortium including several academic partners, providing ample opportunity for scientific community building. Through participation in a variety of conferences and workshops, partners have actively worked to share insights and advancements made within the project to the wider scientific community (and continue to do so). In addition to participation in conferences, project members have also organised dedicated workshops for the scientific community to present and discuss cutting edge research in relevant fields. Through these events, partners have promoted the work of the project among members of the scientific community.

### 4.1. Attended academic events

#### 4.1.1. *CVPR 2021 (25 June 2021, online)*

At a workshop entitled “ChaLearn LAP Sign Language Recognition in the Wild Workshop” at the conference for Computer Vision and Pattern Recognition (CVPR), UGent partners presented work on sign language recognition models in the context of a machine learning challenge.

#### 4.1.2. *CLIN31 (9 July 2021, online)*

At the 31st Meeting of Computational Linguistics in the Netherlands, a team from SignON presented a poster titled “The SignON project: a Sign Language Translation Framework”. SignON hosted a booth there with the support of TaalUnie.

#### 4.1.3. *AT4SSL workshop (20 August 2021, online)*

The First International Workshop on Automatic Translation for Signed and Spoken Languages was organised by SignON and conducted within the MTSummit2021. Two papers related to the SignON project were presented at the workshop. One long paper entitled “The Myth of Signing Avatars” was presented by John C. McDonald, Rosalee Wolfe, Eleni Efthimiou, Evita Fontinea, Frankie Picron, Davy Van Landuyt, Tina Sioen, Annelies Braffort, Michael Filhol, Sarah Ebling, Thomas Hanke, Verena Krausneker, and one short paper entitled “Defining meaningful units. Challenges in sign segmentation and segment-meaning mapping” was presented by Mirella De Sisto, Dimitar Shterionov, Irene Murtagh,

Myriam Vermeerbergen and Lorraine Leeson. Additionally, Lorraine Leeson presented a plenary paper entitled, “Co-constructing a road map for Sign Language Machine Translation”.

***4.1.4. TaalStudio’s forum “Language and Technology: A Successful combination” (12 November 2021, Utrecht, the Netherlands)***

The workshop was part of the Translation Europe-project of the European Commission, and was about different topics such as automatic translation/interpretation and various applications of language technology. In his session, our scientific project leader Dimitar Shterionov (TiU) talked about the SignON project, differences and similarities between sign and spoken languages, and technical challenges related to machine translation. After his lecture there was a brainstorming session with students about what would be a good way to represent sign language in a written-like form.

***4.1.5. META-Forum 2021 (15 November 2021)***

SignON had a booth at the project expo on the first day of META-FORUM, the international conference series on powerful and innovative Language Technologies for the multilingual information society.

***4.1.6. LEAD ME Winter Training School Madrid 2021 (15 November 2021)***

UPF-GTI ran the 2-hour workshop “Virtual Signers generation within SignON at the winter school Media Accessibility Training: Sign Language and Subtitling for the Deaf and Hard-of-hearing” organised by the COST action LEAD ME (Leading Platform for European Citizens, Industries, Academia and Policymakers in Media Accessibility), attended by around 25 persons.

***4.1.7. MIDAS Ireland (18 November 2021, County Meath, Ireland)***

Professor Lorraine Leeson presented on the topic, “Sign of the Times - Technology and Sign Languages” at this one-day conference that brought together speakers from the European Commission, Intel, IBM Research, Enterprise Ireland, Microchip, and others, which focused on “Digital Transformation enabling a sustainable world”.

**4.1.8. Irish Association of Applied Linguistics Annual Conference (26 November 2021, online)**

Dr Irene Murtagh (TU Dublin), Prof. Lorraine Leeson (TCD) and Rachel Moisselle (TCD) co-presented on the topic of “Sign Languages and Language Technology: Linguistic and Technical Challenges” at this national conference.

**4.1.9. EAMT2022 (1-3 June 2022, Ghent, Belgium)**

At the 23rd Annual meeting of the European Association for Machine Translation, the presentation "Sign Language Translation: Ongoing Development, Challenges and Innovations in the SignON Project" was made by Dimitar Shterionov, Mirella De Sisto, Vincent Vandeghinste, Aoife Brady, Mathieu De Coster, Lorraine Leeson, Josep Blat, Frankie Picron, Marcello Scipioni, Aditya Parikh, Louis ten Bosh, John O’Flaherty, Joni Dambre and Jorn Rijckaert.

**4.1.10. CLIN32 (16 June 2022, Tilburg, the Netherlands)**

The 32nd Meeting of Computational Linguistics in the Netherlands has a special track on Language technology for Dutch Sign Language (NGT) and Flemish Sign Language (VGT), where the following presentations were made by project partners:

- "A corpus for training Sign Language Recognition and Translation: The Belgian Federal COVID-19 Video Corpus" by Vincent Vandeghinste, Bob Van Dyck, Mathieu De Coster and Maud Goddefroy
- "Design principles of an Automatic Speech Recognition functionality in a user-centric signed and spoken language translation system" by Aditya Parikh, Louis ten Bosch, Henk Van den Heuvel and Cristian Tejedor-García
- "Sign segmentation using glosses time-stamps of the Corpus NGT" by Mirella De Sisto and Dimitar Shterionov
- "Data augmentation for machine translation of sign language of the Netherlands and Flemish Sign Language" by Maud Goddefroy and Tim Van de Cruys
- "Progress, Challenges and Innovations of the SignON Project" by Vincent Vandeghinste, Mirella De Sisto, Dimitar Shterionov, Aoife Brady, Mathieu De Coster, Lorraine Leeson, Josep Blat, Frankie Picron, Marcello Scipioni, Aditya Parikh, Louis ten Bosch, John O’Flaherty, Joni Dambre and Jorn Rijckaert

In the poster sessions of the main conference there were also two posters:

- "Attention analysis of a sign language recognition task on the AUTSL dataset" by Jeanne Coppin, Mathieu De Coster and Joni Dambre
- "WordNets? SignNets!" by Ineke Schuurman, Vincent Vandeghinste, Caro Brosens, Margot Janssens and Thierry Declerck

#### ***4.1.11. NLDB2022 (15-17 June, 2022, Valencia, Spain)***

At the 27th International Conference on Applications of Natural Language to Information Systems (NLDB2022) in Valencia, Spain which took place from 15-17 June 2022, the presentation "Linguistically Enhanced Text to Sign Gloss Machine Translation" was given by Santiago Egea Gómez, Luis Chiruzzo, Euan McGill and Horacio Saggion.

#### ***4.1.12. LREC2022 (20-25 June 2022, Marseille, France)***

At the 13th edition of the Language Resources and Evaluation Conference, the following presentations were made:

- "Challenges with Sign Language Datasets for Sign Language Recognition and Translation" by Mirella De Sisto, Vincent Vandeghinste, Santiago Egea Gómez, Mathieu De Coster and Dimitar Shterionov.
- Rachel Moisselle and Lorraine Leeson presented "Language Planning in Action: Depiction as a Driver of New Terminology in Irish Sign Language".
- Ruth Holmes, Ellen Rushe and Anthony Ventresque presented "Improving Signer Independent Sign Language Recognition for Low Resource Languages" at LREC2022's *Seventh International Workshop on Sign Language Translation and Avatar Technology: The Junction of the Visual and the Textual*.

#### ***4.1.13. SLTAT2022 (24 June 2022, Marseille, France)***

At the Seventh International Workshop on Sign Language Translation and Avatar Technology: The Junction of the Visual and the Textual (SLTAT 2022), Ruth M. Holmes, Ellen Rushe, Frank Fowley and Anthony Ventresque gave the presentation "Improving Signer Independent Sign Language Recognition for Low Resource Languages".

## 4.2. Scientific publications in International Sign

Furthermore, as the SignON project partners release scientific publications, we make the extra effort to have the abstracts translated into International Sign. This way we can also make the academia a little bit more accessible to deaf people who might be interested in state-of-the-art (sign) language technologies and keep them following up on our project. We then post these publications with the videos on our SignON website. At the moment of writing this deliverable, there are twelve SignON publications with translated abstracts on our website: <https://signon-project.eu/publications/scientific-publications/>.



## 5. Conclusion

At this moment, we are halfway through the SignON project. In the first co-creation phases of the project, we have been mainly working with (online) focus group interviews and surveys to get a good understanding of acceptable use case scenarios, (technical) user requirements and user needs. Along with the development of the technical components of the SignON application and service and the loosening of COVID restrictions, this focus is shifting to include an approach that makes more use of physical events, such as the round tables and workshops that are to take place during the second half of the project. With these events, we can show the user audience more practical examples and components of the SignON technology, and collect their reactions, evaluations or assessments. These will then be included in our co-creation cycles, leading to an application and service of the best possible quality we can deliver within the project timeframe.