

Norwegian Voice Control Corpus

Norsk talestyringskorpus

1. About the corpus

General introduction

The voice control corpus is a text and speech corpus made by the Norwegian Language Bank at the National Library of Norway. The corpus is an open-source dataset and is intended as training data for the kind of voice controlled assistants you might find on a mobile phone. However, as it is possible to make use of the text and speech parts of the corpus separately, the corpus might also be useful for development of text-based language technology, like chatbots.

The Voice control corpus consists of written queries in both *bokmål* and *nynorsk* within a number of intents, and recordings of these queries. The queries are the type of commands you might give a mobile phone to trigger a certain function, and the intents reflect the functions a mobile phone typically has. The recordings were made by speakers of different Norwegian dialects.

The corpus consists of 10 706 queries within 183 different intents. The intents are sorted into 24 intent groups that are then organised into 9 domains. Most of the queries were recorded, and each query has been segmented into individual audio files (WAV format). The transcriptions, written queries and information about the audio segments and speakers are organised in csv files.

Licence

The Voice control corpus comes with a [CC0 license](#), i.e., it is public domain and can be used for any purpose and reshared without permission.

The written queries

The corpus consists of *bokmål* and *nynorsk* queries within 9 domains. The domains are broad categories of mobile phone functions. The intent groups split some of the larger domains into a lower level categorisation of functions. Table 1 lists all 9 domains and gives examples of intent groups, intents and queries. (English translation is given in parentheses for the purposes of documentation). For an extended list of intent groups with examples of intent and queries, see [Appendix 1](#). For a full overview of the 183 intents, see [Appendix 2](#).

The queries were written with variation in mind so that the intents have a multitude of queries that are different ways of saying the same thing, and can be expected to trigger the same function.

This variation also means that some queries might be considered more idiomatic, while others are round about ways of expressing the same thing, often with an awkward syntax. It was not the goal that all the queries be grammatically correct sentences, seeing as we don't always speak with correct grammar. Rather, we have allowed for any query that is conceivable within an intent.

Domain	Intent group	Intent	Query
E-post (<i>email</i>)	E-post (<i>email</i>)	sva på e-post [til <kontakt>] (<i>reply to email [from <contact>]</i>)	bm: sva på mailen til Anna nn: sva på mailen til Anna (<i>reply to the email from Anna</i>)
Enhetsstyring (<i>device control</i>)	Enhetsstyring (<i>device control</i>)	skru på <binær funksjon> (<i>turn on <binary function></i>)	bm: skru på strømsparing for meg nn: skru på straumsparing for meg (<i>turn on battery saver for me</i>)
Hjelp (<i>help</i>)	Hjelp (<i>help</i>)	oppdag funksjoner (<i>discover functions</i>)	bm: fortell meg hva du kan gjøre nn: fortel meg kva du kan gjere (<i>tell me what you can do</i>)
Medier (<i>media</i>)	Mediekontroll (<i>media control</i>)	spill [<medium>] (<i>play [<medium>]</i>)	bm: skru på filmen nn: skru på filmen (<i>play the film</i>)
Meldinger (<i>messaging</i>)	Meldinger (<i>messaging</i>)	send melding [til <kontakt>] (<i>send message [to <contact>]</i>)	bm: jeg vil gjerne sende en melding til Anna nn: eg vil gjerne senda ei melding til Anna (<i>I would like to send a message to Anna</i>)
Produktivitet (<i>productivity</i>)	Alarm, nedtelling og påminnelser (<i>alarm, timer and reminders</i>)	start nedtelling [med <tidsmengde>] (<i>start timer [with <time>]</i>)	bm: sett på 10 minutter på timeren nn: sett på 10 minutt på timeren (<i>start a 10 minute timer</i>)
Søk (<i>search</i>)	Søk (<i>search</i>)	søk med <søkeord> (<i>search with <search word></i>)	bm: søk på havørn nn: søk på havørn (<i>search for a white-tailed eagle</i>)
Telefoni (<i>telephony</i>)	Telefoni (<i>telephony</i>)	ring [<kontakt> <nummer> <relasjon> <forretning>] [på <nummertype>] (<i>call [<contact> <number> <relation> <business>] [on <number type>]</i>)	bm: kan du ringe Anna mobil er du snill nn: kan du ringa Anna mobil er du snill (<i>could you call Anna mobile please</i>)
Vær (<i>weather</i>)	Vær (<i>weather</i>)	hvordan er været [på <sted>] [på <tidspunkt>] (<i>what is the weather</i>)	bm: sjekk værmeldinga i Bergen i morgen takk nn: sjekk vermeldinga i Bergen i morgon takk

		[in <place>] [at <time>])	(check the weather report for Bergen tomorrow thank you)
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Table 1: Domains and examples of intent groups, intents and queries

Variables

Many of the intents contain entities that are exchangeable depending on what the user wants to ask for, like the name of a song, a place, a contact, an app etc. We have called these entities variables. The queries are not annotated with variable information. Instead, the variables are listed in *NVCC_variables.csv*.

The variables differ between intents, and something that is a variable in one intent, may not be in another. Each intent group shares a set of variable values and the same word or phrase never functions as both a variable and a non-variable in the same intent.

To illustrate, the intent *spill [<medium>] (play [<medium>])* has the variable type *<medium>*. A possible value for this variable is *filmen (the film)*, as used in the query *skru på filmen (play the film)*. Whenever this word is used within this intent, it should be considered a variable, i.e. it can be substituted with another text string with a similar meaning (e.g. *song, TV-series* etc.) without changing the intent of the query. The word *filmen* is never used in a non-variable sense in the intent *spill [<medium>]*, however, it might be in a different intent.

Intent names

The names of the intents have been formulated to reflect what function the intent is meant to trigger, what variables you might find in the queries, and what parts of the queries are optional:

- Variables are written in angle brackets < >.
 - slett <kontakt>
- Optional parts are written in square brackets [].
 - opprett [<spilleliste>] [og legg til sang]
- Optional variables are wrapped in both [< >].
 - spill [<medium>]
- A pipe | is used as a disjunction in cases where you can have either of multiple alternatives.
 - ring [<kontakt>|<nummer>|<relasjon>|<forretning>] [på <nummertype>]
- Parentheses () are used to group together disjoined alternatives that are not optional and therefore not wrapped in square brackets.
 - spill (<ny> trailer|trailer for <film>)

Queries

All the 10 706 queries have both a *bokmål* and *nynorsk* version. There is no English translation of the queries.

For the most part, the *bokmål* and *nynorsk* queries adhere to their respective norms. However, the corpus does allow for English loan words, as they are commonly used in spoken Norwegian. In a few cases, the *nynorsk* queries have *bokmål* loans.

If the same query can mean different things in different contexts, and is a possible query in more than one intent, it has been included in more than one intent. We have allowed for overlap in the corpus rather than make an assumption about what intent ambiguous queries should belong to. Identical queries can therefore be found in the corpus.

The spoken queries

The corpus consists of 9834 recorded queries that have been read by 11 participants from five different dialect areas in Norway. One woman and one man have participated from each area, except Northern Norway where there are two male participants. The participants are also of varying ages.

The five dialect areas (and the counties they include) are:

- Øst-Norge (*Eastern Norway*): Oslo, Viken, Innlandet, Agder
- Sørvest-Norge (*Southwest Norway*): Rogaland
- Nordvest-Norge (*Northwest Norway*): Vestland, Møre og Romsdal
- Midt-Norge (*Mid Norway*): Trøndelag
- Nord-Norge (*Northern Norway*): Nordland, Troms og Finnmark

The participants have been given a three letter code that indicates their gender and dialect area. The first letter is either K or M depending on whether they are female (K) or male (M). The next two letters indicate dialect area: ON (Eastern Norway), SV (Southwest Norway), NV (Northwest Norway), MN (Mid Norway) and NN (Northern Norway). The two male participants from Northern Norway are differentiated with the numbers *_1* and *_2*. Table 2 lists the participant code, age, dialect area and self-reported dialect of all 11 participants.

Participant code	Age	Dialect area	Dialect
KMN	59	Mid Norway	Malm, Trøndelag
KNN	61	Northern Norway	Helgeland, Nordland
KNV	51	Northwest Norway	Jostedal, Vestland
KON	30	Eastern Norway	Oslo, Oslo
KSV	28	Southwest Norway	Klepp, Rogaland
MMN	27	Mid Norway	Steinkjer, Trøndelag
MNN_1	50	Northern Norway	Rana, Nordland
MNN_2	24	Northern Norway	Rana, Nordland
MNV	63	Northwest Norway	Voss, Vestland
MON	37	Eastern Norway	Oslo, Oslo
MSV	25	Southwest Norway	Stavanger, Rogaland

Table 2: Participants

Recordings

The recordings are mostly script-based, but some queries were given spontaneously. The queries were originally written by a speaker of Eastern Norwegian and reviewed by another speaker of Eastern Norwegian. Consequently, the participants were encouraged to change the queries to be more in-tune with their own dialects. They were also asked to give some queries spontaneously in order to capture dialectal variation, sentence structures and vocabulary that did not exist in the script already. The final corpus has captured this dialectal variation.

The script was distributed among the participants in such a way that two or more participants recorded intents from the same domain. For instance, the domain *Telefoni* was covered by MMN, MNV and MSV who recorded a third of the intents each. In this way, some domain specific vocabulary has been recorded by different voices.

Each intent is only read by one participant, but a handful of the most idiomatic queries from selected intents in a domain are read by all the participants who share the domain. This ensures that some of the most typical commands are read by different voices in different dialects.

Equipment and settings

Each session was recorded with two microphones. One recording was made on a mobile phone with the phone's own microphone in order to capture the sound quality you would expect when using a voice assistant on your phone. The other recording was made with a vocal microphone that produces a higher quality recording with less noise. This recording was made on a computer and the microphone was connected to the computer via a sound card.

Equipment used:

- Mobile phone: iPhone XR
- Vocal microphone: AKG D7 dynamic vocal microphone
- Sound card: Focusrite Scarlett 8i6

The phone recordings were made using the app AudioShare, and the computer recordings were made in the program Audacity. The settings in AudiShare were set to keep the device's built-in audio processing, again to create audio similar to what you would get when speaking to your phone's voice assistant. All the recordings are in WAV format, with a bit depth of 24 and a sample rate of 48 kHz.

The sessions were conducted in normal office spaces to mimic the kind of indoor environment in which one might use a voice controlled assistant. The recordings were made in meeting rooms without sound proofing or noise reducing interior. As a result, the recordings have a higher or lower amount of echo and background noise. These sounds are more prominent in the phone recordings than in the computer recordings.

Transcription

The transcriptions are mostly orthographic, with a mix of *bokmål* and *nynorsk* words. Some English loan words are allowed.

Backslash notations

Dialectal pronunciations that deviate greatly from the *bokmål* and *nynorsk* norms are transcribed with a backslash, with a close representation of what was uttered before the backslash and the dictionary form of the word after the backslash. For example, the dialectal interrogative *kesst*, meaning *where*, is very different from either of the written norms. It has been transcribed with the *nynorsk* word *kor* using a backslash notation: *kesst\kor*. In the end we only needed this notation for three words (see Table 3).

Before backslash	After backslash
kest	kor
korsen	korleis
tå	av

Table 3: Backslash notations

Numbers, punctuation and capital letters

The transcriptions do not contain digits, punctuation or capital letters. All numbers are written out with letters, including numbers that are part of names. Thus, the store chain Rema 1000 is transcribed *rema tusen*. Another example is the radio channel P1 which is transcribed *p-én* with a hyphen.

We have allowed for hyphens in the transcriptions when they are part of the standard orthography, and when a name includes a number (as in *p-én*), but we have kept the use of hyphens to a minimum. The 10 hyphenated words are listed in Table 4. Possible inflections are in parentheses.

Words with hyphens
angry-birds-spill
e-mail(en/ene/er)
e-post(ane/ar/en/er)
e-seks
heisann-montebello-plata
p-én
sms-(ane/ar/en/er)
star-wars-trailer(en)

tv-en
tv-seri(ar/e/en/er)

Table 4: Words with hyphens

In a couple of cases a participant has pronounced a number in a nonstandard way. We have chosen to transcribe the number the way it was said, even though it does not adhere to neither the *bokmål* nor *nynorsk* norms. The two relevant cases are found in table 5.

Non-standard transcription of numbers
toogtyvende
tredve

Table 5: Non-standard transcription of numbers

Non-words and metadata labels

The transcriptions also include non-words, like hesitation sounds and interruptions. Hesitations are transcribed *eee* (oral hesitations) and *mmm* (nasal hesitations), other sounds like coughing and laughter are transcribed *qqq*, and interruptions are marked with £ after the word (e.g. *tele£*).

Metadata labels are used at the end of the query to mark whether the recording has background noise, contains a mistake or messy pronunciation (see Table 6). We have separated the query and the label with a semicolon. Queries with a metadata label have a space following the transcription and then the semicolon, space and label. Example: *du må skriva en e-post ; <bn>*.

Metadata label	Explanation
; <bn>	background noise
; <ms>	the speaker has made a mistake which has altered the meaning of the query to such an extent that it no longer makes sense within the intent
; <gb>	the speaker has pronounced the query in such a messy way that the utterance has become nonsensical and it is no longer reasonable to expect a voice assistant to trigger correctly

Table 6: Metadata labels

Bokmål and nynorsk queries

The *bokmål* and *nynorsk* queries are purely orthographic. They do not contain non-word transcriptions like hesitations and interruptions. Neither do they contain any mistakes the speaker might have made. The queries do not mix *bokmål* and *nynorsk* words, but stick to their respective norms, and they follow some standard orthographic conventions like capital letters in names and numbers written with digits. Still, the *bokmål* and *nynorsk* queries do not have capital letters at the beginning of the sentences, nor punctuation.

Description of files

The corpus has four files: the zip file *NVCC_segmented_audio_files.zip* containing the spoken queries, the csv file *norwegian_voice_control_corpus.csv* with all the written queries that have been recorded, the csv file *NVCC_queries_not_recorded.csv* with the queries that were not recorded, and the csv file *NVCC_variables.csv* with the variables.

NVCC_segmented_audio_files.zip

The zip file contains two folders:

- kanal_1: the channel 1 audio files (phone recording), 9834 spoken queries in individual WAV-files.
- kanal_2: the channel 2 audio files (computer recording), 9834 spoken queries in individual WAV-files.

norwegian_voice_control_corpus

The csv file is organised by domain, intent group, intent and then query. The csv contains columns with the *bokmål* and *nynorsk* queries, transcriptions and further information about the segments and speakers.

Columns:

- domain: name of domain
- intent_group: name of intent group
- intent: name of intent
- nn-NO: *nynorsk* query
- bm-NO: *bokmål* query
- duration: segment duration for the spoken query
- transcription: transcription of the spoken query
- spontaneous: spontaneous queries have True values, script-based queries have False values.
- channel_1: audio file name for the channel 1 segment (phone recording)
- channel_2: audio file name for the channel 2 segment (computer recording)
- speaker: three letter participant code
- dialect: participant's dialect area

NVCC_queries_not_recorded.csv

The csv file is organised by domain, intent group, intent and then query. The queries were not recorded and consequently do not have columns with information about transcriptions, segments or speakers.

Columns:

- domain: name of domain
- intent_group: name of intent group
- intent: name of intent
- nn-NO: *nynorsk* query
- bm-NO: *bokmål* query

NVCC_variables.csv

The csv file is organised by intent group and lists the variable type and possible values. The possible values are separated by commas.

Columns:

- `intent_group`: name of intent group
- `variable_type`: name of variable type
- `variable_value_nn-NO`: a list of the possible *nynorsk* values for the variable type in the intent group
- `variable_value_bm-NO`: a list of the possible *bokmål* values for the variable type in the intent group

2. Workflow

Initial research

During the initial research period, we gathered information about different functions that existing voice controlled assistants cover, and made an overview of possible domains and intents. All the information was found online and a list of sources is provided in [Appendix 3](#). We also used an iPhone XR as a source of information about what functions smartphones typically have.

From there, we narrowed down a set of intents to include in the corpus based on what we perceived to be the most important functions to cover, and wrote queries for each intent.

Recording script-based and spontaneous queries

The written queries were used as scripts for the recording sessions with the participants. Each participant recorded somewhere between 700 and 1200 queries over two sessions, and the sessions were between 30 and 60 minutes long. At the beginning of the first session, the participants were given information about the project and the task at hand. As mentioned previously, we asked them to make any changes they wanted so that the queries would be more in-tune with their dialects.

Eliciting spontaneous queries

The participants returned for a third session to record the spontaneous queries. When eliciting spontaneous queries, we tried to influence their choice of words as little as possible. They were asked to say queries for intents they had not read a script for previously, and we attempted to show them on a mobile phone what we wanted them to ask the phone to do, rather than explain it in words. The spontaneous queries have been sorted into intents based on what function it makes the most sense that they would trigger.

The spontaneous queries often differ from the script-based queries in the same intent. This is wanted because it demonstrates other possible ways of asking for the same thing. However, it also means the queries might contain different variable types and values than

the ones listed for the intent. It must therefore be noted that the variables only reflect the variables in the script-based queries, not the spontaneous queries.

Segmentation, transcription and translation

The recordings were segmented and transcribed in the transcription software [ELAN](#). The recordings were first segmented into individual queries and any audio that was not to be included in the corpus was cut. Next, the segments were run through a Norwegian ASR (Automatic Speech Recognition) system created by the [AI-lab at the National Library of Norway](#). These transcriptions were then manually corrected by a transcriber according to a set of transcription guidelines. All the manual transcriptions were reviewed by a second person.

Once the transcriptions were finished, the transcribers created matching *bokmål* and *nynorsk* queries (as found in the finished corpus). They are purely orthographic according to their respective norms and do not contain a mix of *bokmål* and *nynorsk*.

The *bokmål* queries used the original script as a basis, but were changed to match what was actually said in the recordings, seeing as the participants were asked to make any changes they wanted. The *bokmål* queries were automatically translated into *nynorsk* using the [Apertium](#) translation tool, and the transcribers then reviewed the translations – first of all to make sure the *nynorsk* was correct, and second of all to make sure they reflected the spoken queries.

Audio file processing

The phone and computer recordings were synchronised before the segmentation step. The two recordings from each session were made into two channels in one stereo file and were synchronised to overlap as precisely as possible. The stereo file was then segmented, which ensured that all the segments from the phone and computer recordings had the same timestamps.

After the transcription step was concluded, the audio files were divided into individual segments and the two channels were broken back up into separate files. Subsequently, there's one WAV file for each query for both the phone (channel 1) and computer (channel 2) recordings. The audio files were split using the python pydub library.

3. Guidelines

Principles for segmentation

Each query is one segment. We have included queries with background noise, or where the speaker has made a mistake, and marked them with metadata labels.

If a participant changes a query to be more in line with how they would say it in their dialect, similar queries in the script might become identical. Identical queries have been included, not removed.

Principles for transcription

The transcriptions of the recordings are orthographic and adhere to the *bokmål* and *nynorsk* norms, but can contain a mix of *bokmål* and *nynorsk* words in the same query in order to represent the dialectal speech as faithfully as possible. The choice between *bokmål* and *nynorsk* words is always based on which word is closest to what was spoken. The same goes for choices between multiple allowed word forms within one of the norms.

To illustrate, if the speaker has *a*-infinitives in their dialect, we transcribe with *a*-infinitives according to the *nynorsk* norm. Similarly, if the speaker says /spele/ (*play*) with a long *e* and short *l*, we transcribe it *spele* according to the *nynorsk* norm, whilst if the speaker says /spelle/ with a short *e* and long *l*, we transcribe it *spelle* according to the *bokmål* norm.

Non-word sounds

In order for the transcriptions to closely represent the audio, they also contain some non-word transcriptions. We have transcribed hesitation sounds, coughing, laughter and interrupted words. Oral hesitations are transcribed *eee*, nasal hesitations *mmm*, and coughing, laughter and other sounds *qqq*. Interruptions are marked with £ after the word.

Whenever a speaker makes a mistake, it is included in the transcription, either as an interrupted word or as a fully uttered word that is transcribed according to its orthography. The transcriptions do not leave these mistakes out, but if a mistake changes the meaning of the query, or there are so many mistakes that the query becomes nonsensical, the query is marked with a metadata label (see Table 6 above).

Prosody

The script-based queries might have prosodic features that are typical when reading a list, such as clear enunciation, rising intonation towards the end of the utterance or unnatural emphasis on certain words. Such prosodic features have not been annotated or marked in any way in the transcriptions.

Principles for the bokmål and nynorsk queries

Even though the queries are either *bokmål* or *nynorsk*, they still reflect the speaker's dialect as closely as possible. Whenever multiple word forms are possible within the norm, we choose the word closest to what was spoken. For instance, *nynorsk* allows for both *a*-infinitives and *e*-infinitives. If the speaker has *a*-infinitives in their dialect, we write *a*-infinitives. Similarly, *bokmål* allows for both *a*-inflections and *en*-inflections in feminine nouns. If the speaker has *a*-inflections in their dialect, we write *a*-inflections.

The choices in word forms are not necessarily consistent across a speaker's queries but reflect what was said in each case.

If the norm does not allow for any word form close to what the speaker said, we write the normalised word even if it differs from the pronunciation. We do not mark these cases in any way or use backslash notation. For instance, the interrogative *hvordan* (*how*) is only allowed in *bokmål*. If the speaker says /*hvordan*/, we write *korleis* in the *nynorsk* query.

Certain *bokmål* words are not possible in *nynorsk* and the *nynorsk* equivalents may be quite different. In cases where a *bokmål* word was uttered and transcribed in the recording, but a *nynorsk* equivalent is far removed from the pronounced word, we've allowed for the *bokmål* word to be a loan word in the *nynorsk* query. We've only allowed this in special cases. An example is the word *anrop* (*call*) which is not possible in *nynorsk*. The nearest *nynorsk* equivalent is *samtale* (*conversation*), a different word altogether. Queries where the speaker has said /*anrop*/, have the word *anrop* in the *nynorsk* query.

Generally, the inflections in the queries reflect the inflections of the dialect speaker. However, we have not altered the word forms when the pronunciation is close enough to the word that it is conceivable that is how one would pronounce the word. Examples are *mer* vs. *mere* (*more*) and *lenger* vs. *lengre* (*longer*).

Where the *bokmål* queries have the politeness word *vennligst* (*please*), the *nynorsk* queries have the phrase *vær vennleg og* (*please*). In *bokmål*, *vennligst* is commonly used as a politeness phrase, though it also functions as the superlative form of the adjective *vennlig* (*kind*). The *nynorsk* translation *vennlegast* (*kindest*) is only used as a superlative adjective and cannot be used in the politeness sense. The syntax and semantics of the sentence would become nonsensical.

4. Questions and feedback

Questions, comments and feedback about the NVCC are very welcome. We are also interested in corrections, modifications or derived resources (with an open license) that users make, which may be of interest to the speech technology community. To get in touch with us, use sprakbanken@nb.no.

5. Appendices

Appendix 1

Domains and intent groups with examples of intents and queries

Domain	Intent group	Example intent	Example query
E-post (<i>email</i>)	E-post (<i>email</i>)	sva på e-post [til <kontakt>] (<i>reply to email [from <contact>]</i>)	bm: sva på mailen til Anna nn: sva på mailen til Anna (<i>reply to the email from Anna</i>)

Enhetsstyring (<i>device control</i>)	Enhetsstyring (<i>device control</i>)	skru på <binær funksjon> (<i>turn on <binary function></i>)	bm: skru på strømsparing for meg nn: skru på straumsparing for meg (<i>turn on battery saver for me</i>)
Hjelp (<i>help</i>)	Hjelp (<i>help</i>)	oppdag funksjoner (<i>discover functions</i>)	bm: fortell meg hva du kan gjøre nn: fortel meg kva du kan gjere (<i>tell me what you can do</i>)
Medier (<i>media</i>)	Mediekontroll (<i>media control</i>)	spill [<medium>] (<i>play [<medium>]</i>)	bm: skru på filmen nn: skru på filmen (<i>play the film</i>)
	Musikk (<i>music</i>)	spill musikk [på <strømmetjeneste>] (<i>play music [on <streaming platform>]</i>)	bm: kan du sette på musikk på Spotify nn: kan du sete på musikk på Spotify (<i>could you play music on Spotify</i>)
	Podkast (<i>podcast</i>)	finn (<podkast> podkast om <tema>) (<i>find (<podcast> podcast about <subject></i>)	bm: kan du finne en film-podkast nn: kan du finne ein film-podkast (<i>could you find a film podcast</i>)
	Radio (<i>radio</i>)	spill [<radiokanal>] (<i>play [<radio channel>]</i>)	bm: jeg vil høre på P1 på radio nn: eg vil høyre på P1 på radio (<i>I want to listen to P1 on the radio</i>)
	Lydbok (<i>audiobook</i>)	fortsett [<lydbok>] (<i>continue [<audiobook>]</i>)	bm: fortsett på Hobbiten på lydbok nn: fortsett på Hobbiten på lydbok (<i>continue with The Hobbit on audiobook</i>)
	Film og TV (<i>film and TV</i>)	spill [<film>] [på <enhet>] [på <strømmetjeneste>] (<i>play [<film>] [on <device>] [on <streaming platform>]</i>)	bm: spill av Titanic på Netflix nn: spel av Titanic på Netflix (<i>play Titanic on Netflix</i>)
	Videoer (<i>videos</i>)	spill (<ny> trailer trailer for <film>) (<i>play (<new> trailer trailer for <film>)</i>)	bm: jeg vil se traileren til Star Wars nn: eg vil sjå traileren til Star Wars (<i>I want to see the trailer for Star Wars</i>)
	Nyheter (<i>news</i>)	finn siste nyheter (<i>find latest news</i>)	bm: dagens nyheter nn: dagens nyheiter (<i>today's news</i>)
	Spill (<i>games</i>)	spill <spill> (<i>play <game></i>)	bm: start Angry Birds nn: start Angry Birds (<i>start Angry Birds</i>)
	Cast	cast [<medium>] [<fra	bm: cast filmen på TV-en

	(casting)	enhet] til <enhet> (cast [<medium>] [<from device>] to <device>)	nn: cast filmen på TV-en (cast the film on the TV)
Meldinger (messaging)	Meldinger (messaging)	send melding [til <kontakt>] (send message [to <contact>])	bm: jeg vil gjerne sende en melding til Anna nn: eg vil gjerne senda ei melding til Anna (I would like to send a message to Anna)
Produktivitet (productivity)	Alarm, nedtelling og påminnelser (alarm, timer and reminders)	start nedtelling [med <tidsmengde>] (start timer [with <time>])	bm: sett på 10 minutter på timeren nn: sett på 10 minutt på timeren (start a 10 minute timer)
	Kalender, lister og kontakter (calendar, lists and contacts)	vis dagens kalender (show today's calendar)	bm: hva er på kalenderen min i dag nn: kva er på kalenderen min i dag (what's on my calendar today)
	Sletting (deletions)	slett <kontakt> (delete <contact>)	bm: fjern kontakten min Anna nn: fjern kontakten min Anna (remove my contact Anna)
	Kalkulator (calculator)	regn ut <tall> <funksjon> <tall> (calculate <number> <function> <number>)	bm: hvor mye er 2 + 2 nn: kor mykje er 2 + 2 (how much is 2 + 2)
	Tid (time)	hva er klokka (what is the time)	bm: hvor mye er klokka nn: kor mykje er klokka (what is the time)
Søk (search)	Søk (search)	søk med <søkeord> (search with <search word>)	bm: søk på havørn nn: søk på havørn (search for a white-tailed eagle)
	Lokalsøk (local search)	søk etter <forretningstype> (search for <business type>)	bm: hvor er nærmeste frisør nn: kor er nærmaste frisør (where's the nearest hair salon)
	Trafikksøk (traffic search)	søk etter trafikkopdatering (search for traffic updates)	bm: finn ut hvordan trafikken er i dag nn: finn ut korleis trafikken er i dag (check what the traffic is like today)
Telefoni (telephony)	Telefoni (telephony)	ring [<kontakt> <nummer> <relasjon> <forretning>] [på <nummertype>] (call [<contact> <number> <relation> <business>] [on <number type>])	bm: kan du ringe Anna mobil er du snill nn: kan du ringa Anna mobil er du snill (could you call Anna mobile please)

Vær (<i>weather</i>)	Vær (<i>weather</i>)	hvordan er været [på <sted>] [på <tidspunkt>] (<i>what is the weather [in <place>] [at <time>]</i>)	bm: sjekk værmeldinga i Bergen i morgen takk nn: sjekk vermeldinga i Bergen i morgon takk (<i>check the weather report for Bergen tomorrow thank you</i>)
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Appendix 2

List of intents

Domain	Intent
E-post	les opp e-post (fra <kontakt> fra <tidspunkt> etter <e-postorden>)
	les opp ny e-post
	send e-post [til <kontakt>] [med <tittel>]
	send e-post [til <kontakt>] [med <tittel>] med <beskjed>
	svar på e-post [til <kontakt>]
	svar på e-post [til <kontakt>] med <beskjed>
	åpne e-post (fra <kontakt> fra <tidspunkt> etter <e-postorden>)
	åpne ny e-post
Enhetsstyring	bytt fra frontkamera
	bytt kamera
	bytt til frontkamera
	demp skjermlys [<relativ mengde>]
	demp volumet [<relativ mengde>]
	hvor mye batteri har mobilen
	skru av <binær funksjon>
	skru av lydløs
	skru av strømsparing
	skru på <binær funksjon>
	skru på lydløs
	skru på strømsparing
	start videoopptak
	stopp videoopptak
	ta bilde med bildenedtelling [i <tidsmengde>]
	ta et bilde
	øk skjermlys [<relativ mengde>]
	øk volumet [<relativ mengde>]
åpne <app>	
Hjelp	oppdag funksjoner
Medier	abonner [på <podkast>]
	bytt til [<radiokanal>]
	cast [<medium>] [<fra enhet>] til <enhet>
	demp volum [<relativ mengde>] [på <enhet>] [i <medium>]
	finn (<filmmedium> <film> <tv-serie>)
	finn (<podkast> podkast om <tema>)
	finn [<lydbok>] [i <sjanger>]

finn <filmmedium> i <sjanger>
finn lignende <filmmedium>
finn nyheter om <tema>
finn siste nyheter
finn video (med <innhold> i <sjanger> med <navn>)
fjern [<sang>] [av <artist>] fra [<spilleliste>]
fortsett [<lydbok>]
gjenoppta avspilling [av <medium>]
gjenta [<musikkmedium>]
hva [av <medium>] er det som spiller
hvilken sang har <sangstrofe>
hvilken sang spiller
kjøp [<album>] [av <artist>]
kjøp [<lydbok>]
kjøp [<sang>] [av <artist>]
kø <sang> [av <artist>]
last ned [<episode> av] [<podkast>]
legg til [<sang>] [av <artist>] i [<spilleliste>]
les artikkel [fra <nettsted>] høyt
lik sang
opprett [<spilleliste>] [og legg til sang]
pause avspilling [av <medium>]
shuffle [i <musikkmedium>]
skru av undertekst [med <språk>] [i <medium>]
skru på undertekst [med <språk>] [i <medium>]
skru volum til <volumnivå> [på <enhet>] [i <medium>]
slett [<episode> av] [<podkast>]
slett [<lydbok>]
slett [<spilleliste>]
slutt å abonnere [på <podkast>]
slutt å caste [<medium>] [fra <enhet>] [til <enhet>]
spill (<episode> <sesong>) av <tv-serie>
spill (<ny> trailer trailer for <film>)
spill (<sjanger> <musikktype>) [på <strømmetjeneste>]
spill [<episode> av] [<podkast>] [på <strømmetjeneste>]
spill [<film>] [på <enhet>] [på <strømmetjeneste>]
spill [<lydbok>]
spill [<lydbok>] i <tidsmengde>
spill [<medium>]
spill [<radiokanal>]
spill [<spilltype>] med taleassistenten
spill <album> [av <artist>] [på <strømmetjeneste>]
spill <antall> <medium> senere
spill <antall> <medium> tidligere
spill <artist> [på <strømmetjeneste>]
spill <medium>
spill <sang> [av <artist>] [på <strømmetjeneste>]

	spill <spill>
	spill <spilleliste> [på <strømmetjeneste>]
	spill <tv-serie> [på <enhet>] [på <strømmetjeneste>]
	spill annet av <artist> [på <strømmetjeneste>]
	spill forrige [<medium>]
	spill lignende musikk
	spill musikk [på <strømmetjeneste>]
	spill neste [<medium>]
	spill noe nytt
	spill topp [<antall>] sanger [av <artist>] [fra <år>]
	spill video (med <innhold> <sjanger> med navn>)
	spol bakover [<relativ mengde>] [i <medium>]
	spol bakover <tidsmengde> [i <medium>]
	spol forover [<relativ mengde>] [i <medium>]
	spol forover <tidsmengde> [i <medium>]
	start [<medium>] på nytt
	stopp avspilling [av <medium>]
	søk etter video på <videotjeneste> [med <innhold>] [i <sjanger>] [med <navn>]
	øk volum [<relativ mengde>] [på <enhet>] [i <medium>]
Meldinger	les opp melding (fra <kontakt> fra <tidspunkt> etter <meldingsorden>)
	les opp ny melding
	send melding [til <kontakt>]
	send melding [til <kontakt>] med <beskjed>
	send talemelding [til <kontakt>]
	send talemelding [til <kontakt>] med <beskjed>
	svar på melding [til <kontakt>]
	svar på melding [til <kontakt>] med <beskjed>
	åpne melding (fra <kontakt> fra <tidspunkt> etter <meldingsorden>)
	åpne ny melding
Produktivitet	angi at <kontakt> [<pronomen>] er <slektskap>
	del <tall> på <tall>
	finn <kontakt>
	fjern <listepunkt> [fra <liste>] [av <listetype>]
	gang <tall> med <tall>
	gjenoppta nedtelling
	gjenstående nedtelling
	husk [<påminnelse>] [til <tidspunkt>]
	hva er <tall> prosent av <tall>
	hva er klokka
	hva er klokka på <sted>
	hva er påminnelsene mine
	hva står på [<liste>] [av <listetype>]
	hvilken dato er det
	hvor mange prosent er <tall> av <tall>
	lag ny [<liste>] [av <listetype>]
	lagre [<kalenderhendelse>] [på <tidspunkt>]

	legg til [<nummertype>] <nummer> i <kontakt>
	legg til [dette nummeret som] [<kontakt>]
	legg til <listepunkt> [på <liste>] [av <listetype>]
	marker <listepunkt> [på <liste>] [av <listetype>]
	pause nedtelling
	pluss <tall> med <tall>
	regn ut <tall> <funksjon> <tall>
	slett (<liste> <listetype>)
	slett [<kalenderhendelse>] [på <tidspunkt>]
	slett [<påminnelse>] [på <tidspunkt>]
	slett <kontakt>
	slett <produktiv funksjon>
	slett alarm på <tidspunkt>
	slumre
	start nedtelling [med <tidsmengde>]
	still inn alarm [til <tidspunkt>]
	stopp [alarm nedtelling]
	trekk <tall> fra <tall>
	vis dagens kalender
Søk	søk etter <forretning> [på <sted>]
	søk etter <forretningstype>
	søk etter <sted> i kart
	søk etter bilde med <søkeord>
	søk etter bilder i google med <søkeord>
	søk etter informasjon om <tema>
	søk etter trafikkoppdatering
	søk etter trafikkoppdatering (på <sted> mellom <sted> og <sted>)
	søk etter trafikkoppdatering om <personlig sted>
	søk etter åpningstid for <forretning> [på <sted>] [på <tidspunkt>]
	søk med <søkeord>
	søk med google med <søkeord>
Telefoni	avslå anrop [fra <kontakt>]
	avslå videoanrop [fra <kontakt>]
	legg på samtalen [med <kontakt>]
	legg på videoanrop [med <kontakt>]
	ring [<kontakt> <nummer>] [på <nummertype>] på høyttaler
	ring [<kontakt> <nummer> <relasjon> <forretning>] [på <nummertype>]
	ring <nødetat>
	ring med videoanrop [til <kontakt> <nummer> <relasjon> <forretning>] [på <nummertype>]
	skru av høyttaler
	skru av kamera
	skru av mikrofon
	skru på høyttaler
	skru på kamera
	skru på mikrofon
	spill ny personsvarmelding

	spill personsvarmelding (fra <kontakt> fra <tidspunkt>)
	svar anrop [fra <kontakt>]
	svar videoanrop [fra <kontakt>]
Vær	blir det <nedbørsord> [på <sted>] [på <tidspunkt>]
	hva er temperaturen [på <sted>] [på <tidspunkt>]
	hva er vindhastigheten [på <sted>] [på <tidspunkt>]
	hvor høy luftfuktighet er det [på <sted>] [på <tidspunkt>]
	hvordan er været [på <sted>] [på <tidspunkt>]
	når går sola <retning> [på <sted>] [på <tidspunkt>]

Appendix 3

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