

# Annotation Guidelines for labeling Aspect-Based Sentiment Analysis en Aspect-Based Emotion Analysis in the SentEMO project

Version 1.0

LT3 technical report – LT3 23-01

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June 7th, 2023

# ANNOTATION MANUAL

## ABSA + ABEA



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## I. GENERAL

### **What is SentEMO?**

SentEMO is a project in which Ghent University and Artevelde University College have joined forces with partners from the industry (<https://www.sentemo.org/>) with a view to developing a multilingual, self-learning software platform for aspect-based sentiment and emotion analysis. For this platform, annotated data are required from different domains. This document contains the guidelines for the annotation of data for the purposes of ABSA and ABEA.

### **What are ABSA and ABEA?**

ABSA stands for *aspect-based sentiment analysis*. Sentiment analysis is a computational linguistics technique for automatically recognising positive or negative opinions in texts. Current systems detect sentiment on sentence level. This means that if several expressions of sentiment occur in a sentence, these systems produce a generalised account of these sentiments. ABSA tries to distinguish not only different expressions within the same sentence, but also the topic to which the expression of sentiment relates. This breaks down a general sentiment on sentence level into detailed aspects. ABEA stands for *aspect-based emotion analysis* and follows the same structure as ABSA. An attempt has not yet been made to conduct emotion analysis at the aspect level.

### **How does annotation work?**

We annotate datasets from the following domains: FMCG-retail, Hotel, Airline, Hospital and Telecom. Each dataset contains 1000 reviews written by customers, guests and users. The work is divided among the different annotators. We work with an online annotation tool, INCEpTION.

## II. ANNOTATION

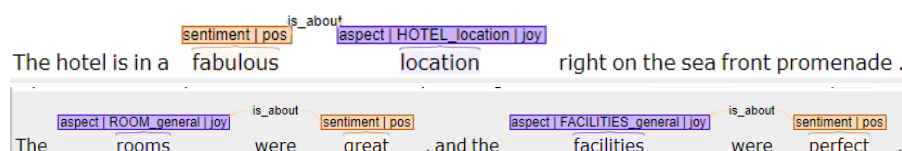
### What is the purpose of annotating?

The purpose of annotating is to identify all pairs of aspect and sentiment terms in the reviews. Pairs are only considered within a sentence, and thus cannot span multiple sentences. Both the aspect and the sentiment term can contain several words or tokens (tokens are words and punctuation marks). The aspect term contains the tokens that express the subject of the opinion, while the sentiment term contains the tokens that express the opinion. In addition, the aspect is tagged according to a list of categories relevant to the domain. The polarity of the sentiment is tagged. If an aspect-sentiment pair lacks an explicit expression of the aspect, the sentiment is associated with a NULL aspect. Given a pair of aspect and sentiment terms, or a NULL aspect, the emotion that seems most applicable to the writer's tone in that piece of text is chosen from a list of basic emotions. Since clues to that choice may be very implicit, the emotion is associated with the aspect terms or the NULL terms. The emotion tagging is seen as an extension of the sentiment annotations.

### How should an aspect be tagged?

An aspect belongs to a category, which is defined by an entity and an attribute. An entity refers to a certain part that is important in the domain in question. An attribute defines a property of the entity and details the category of the aspect.

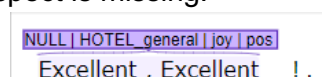
- For an overview of all possible tags per domain, see the annotation scheme.
- Every entity has `general` and `misc` as possible attributes. If the aspect is not explicit or detailed enough to determine the attribute, `general` can be tagged. If there is an explicit attribute mentioned for the entity that is not in the tagset, `misc` can be tagged.
- For a brief explanation of the other categories, see the annotation scheme.
- The annotating is done in a concise manner. This means that when selecting tokens for an aspect term, only the most substantive words that are relevant to the situation are selected. For example, articles are omitted in your selection.



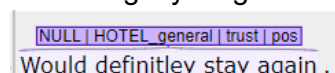
### How should a NULL aspect be tagged?

NULL aspects are only used when a sentence contains sentiment terms, but no terms explicitly related to an aspect. In the following situations, the sentiment should be tagged with a NULL aspect:

- The aspect is missing.



This includes slightly longer terms that express a general sentiment.



Sometimes a review is written very informally, and it is simply not clear what a sentiment refers to. If such a sentence does clearly contain an emotion, it may be annotated entirely as a NULL aspect.

NULL | HOTEL\_general | dissatisfaction | neg  
we left 2days early .

- The aspect is implicit. Think of "there is" constructions and similar.

NULL | FOOD&DRINKS\_availability | joy | pos  
Tea and coffee making facilities , lovely to have after being out all day .  
NULL | AMENITIES\_availability | satisfaction | pos    NULL | AMENITIES\_availability | satisfaction | pos    NULL | AMENITIES\_availability | satisfaction | pos  
Tv                      and                      iron                      with                      iron board                      in room .

- The aspect contains no relevant information. All referring pronouns and personal pronouns are included.

NULL | PRODUCT\_misc | neutral | neu  
It's reasonably quiet for the airflow you get , but I am also using it in a lab vs bedroom .

Despite the absence of an explicit aspect, the aspect category can usually be deduced from the rest of the sentence or the other sentences. If this is not possible, tag the NULL aspect as generally as possible, e.g. PRODUCT\_general or HOTEL\_general.

Note that it is still the intention to annotate nouns as explicit aspects whenever possible. Compare

NULL | PRODUCT\_misc | satisfaction | very\_pos  
It works really quiet too .

and

aspect | PRODUCT\_quality | joy    sentiment | pos  
This thing moves AIR !

In the first case, there is only an implicit reference to the product with the term "him", and so "very nice" may be tagged as a NULL aspect. In the second case, we recognise "delay" as an explicit aspect, to which "one hour" is tagged as a sentiment. So, start from the presence or absence of an explicit aspect, even if the sentiment terms are very implicit. The name of a company or product can also act as an explicit aspect:

aspect | COMPANY\_general | dissatisfaction    is\_about    is\_about  
aspect | COMPANY\_general | satisfaction    sentiment | very\_pos    sentiment | neg  
Easyjet    have been absolutely great and    terrible .

## How should a sentiment be tagged?

Sentiment is tagged on a polarity scale from very negative to very positive. The possible tags for polarity are very positive, positive, neutral, negative and very negative.

- Positive and negative are tagged in most cases.

aspect | FOOD&DRINKS\_general | joy    is\_about    sentiment | pos  
Breakfast    was    lovely .

- Very positive and very negative tags are used when the sentiment term contains one or more tokens that reinforce the sentiment.

aspect | PRODUCT\_misc | satisfaction    is\_about    sentiment | very\_pos  
This    air purifier    is    super quiet    that I do n't even remember it 's on when I wake up in the morning .  
aspect | ROOM\_comfort | dissatisfaction    is\_about    sentiment | very\_neg  
The    room    was    very warm    on arrival

- Neutral is tagged if the tokens of the sentiment term do not express an unambiguous opinion.

The **filters** are n't unreasonably expensive nor do I have to replace them too frequently .

aspect | PRODUCT\_price | neutral is\_about sentiment | neu

- Often, a writer does not express sentiment through adjectives or adverbs, but through a description of the situation. This yields more implicit sentiment terms, which can still be annotated. Only the terms that have a subjective dimension need to be annotated. For many descriptions, it is possible to rely on our common sense to decide whether something is positive or negative. If that is not the case, there is no need to annotate the pair.

Edelweiss is located close to the seafront .

aspect | HOTEL\_location | satisfaction is\_about sentiment | pos

Asked for a fan but didn't have any no net curtains or blinds on Windows so

no privacy ( we had to put a towel over the open

The downside to it is there is no parking .

sentiment | neg is\_about aspect | FACILITIES\_availability | dissatisfaction

Lots of space allocated in the kitchen for each flat mate .

sentiment | pos is\_about aspect | FACILITIES\_comfort | satisfaction

- Nouns, in whatever conjugation, may contain relevant information. They can be included in the sentiment term.

The candle itself looks nice and I like that it comes in a re-usable jar .

aspect | PRODUCT\_eco-friendliness | satisfaction is\_about sentiment | pos

aspect | PRODUCT\_style | satisfaction is\_about sentiment | pos

But since they changed it to ' quick size ' the quality has been lacking .

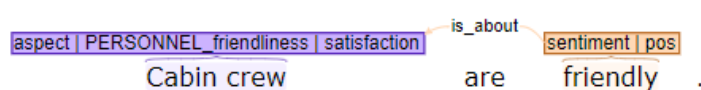
aspect | PRODUCT\_quality | dissatisfaction is\_about sentiment | neg

- Here too, the rule is to annotate concisely.

## How should an emotion be tagged?

There are various frameworks for tagging emotions. For SentEMO, we draw on Plutchik's Wheel of Emotions (Plutchik 1991), to which the following diagram pertains.

- satisfaction: feeling happy, being content, where the emotion joy is too strong and a degree of satisfaction is simply expressed.



- The communication worked very well by e-mail

Been sentiment | pos fantastic with is\_about aspect | COMPANY\_service | joy refunds, had sentiment | neg no is\_about aspect | COMPANY\_general | satisfaction problems at all.

- trust: sense of reliability, safety, gives a warm feeling. Also when the writer would recommend a company or product.

NULL | PRODUCT\_general | trust | very\_pos  
Highly recommend, and much cheaper buying in bulk on Amazon than at the grocery store.

aspect | COMPANY\_reliability | trust is\_about sentiment | pos  
Communication relabel.

- dissatisfaction: feeling displeased, when a negative feeling is expressed but the label anger is too strong.

sentiment | neg is\_about aspect | PRODUCT\_general | dissatisfaction  
I am not happy with the Regular Size Sheets.

NULL | FLIGHT\_misc | dissatisfaction | neg  
There is something up with the cabin pressure.

- anger: feeling vexed, resentful, not satisfied at all.

aspect | PERSONNEL\_hospitality | anger  
aspect | PERSONNEL\_friendliness | anger  
aspect | PERSONNEL\_friendliness | anger  
aspect | PERSONNEL\_general | anger  
No, ground staff are REALLY appalling: sentiment | very\_neg rude, sentiment | neg arrogant, sentiment | neg aloof...5.  
NULL | FLIGHT\_general | anger | neg  
Nightmare with a little child.

- fear: being afraid, panicking, not at all at ease, feeling unsafe.

NULL | COMPANY\_general | fear | neg  
I am now nervous to book with them again.

NULL | PRODUCT\_quality | fear | neg  
These are NOT SAFE.

- sadness: unhappy, feeling dejected about something, not being happy.

NULL | COMPANY\_general | sadness | neg  
I am so disappointed with easyJet.  
aspect | COMPANY\_general | sadness is\_about sentiment | neg  
my disappointment sadly grows

- disgust: revolting, unpleasant, distasteful, "eugh!".

aspect | PRODUCT\_misc | disgust is\_about sentiment | neg  
Color bled onto egg ( not very appetizing )  
aspect | FOOD&DRINKS\_quality | disgust is\_about sentiment | neg  
Food is rubbish

- surprise: to be astonished, to be taken aback.

NULL | PRODUCT\_style | surprise | neg  
Thinner than I thought they 'd be as a Dixie product.  
NULL | PRODUCT\_price-quality | surprise | neg in\_span\_with NULL | PRODUCT\_price-quality | surprise | neg  
For the price I paid for a plastic stick, I expected better quality.

- anticipation: curious, inquisitive, looking forward to. The writer clearly has high expectations and expresses them. This is the writer's own feeling, not the feeling he is trying to instil in the reader.



NULL | HOTEL | general | anticipation | pos

Cant wait to come back .

- distrust: feeling suspicious, betrayed, not having faith in the organisation/product.

It appears the same misleading advertising has been occurring for years and Amazon has n't corrected it .

NULL | PRODUCT | general | distrust | neg

I do n't know if I will be ordering them again ...

- neutral: the lack of any emotion. Here, the sentiment will also be neutral. It is impossible to tag neutral if the sentiment is positive, negative, very\_positive or indeed, very\_negative.

sentiment | neu | aspect | FLIGHT | general | neutral

Okay flight to my home country Colombia

In many cases, the consideration between the following tags will have to be made.

- satisfaction or joy: joy is the stronger emotion of the two. It is obvious from the text that the writer is very satisfied or has enjoyed something. If the sentiment was tagged as being very\_pos, chances are anyway that joy applies, even though this will not always be the case. In general, satisfaction is likely to be more common. When sentiments are reinforced, always follow your instincts.
- For example: joy is good here because the writer is clearly very excited:

sentiment | pos | aspect | HOTEL | general | joy

Thank you so much for such a lovely stay

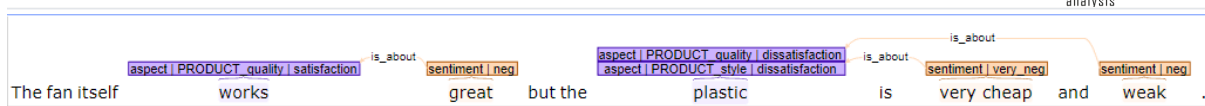
In this example, less enthusiasm can be inferred, so satisfaction is better:

The lady on reception was very nice and polite .

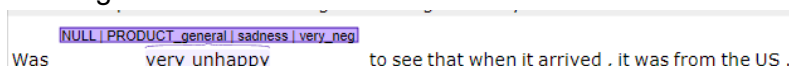
- satisfaction or trust: in the case of trust, a feeling of reliance is expressed. For example, the writer makes it clear that they have been a customer for a long time and have had a good experience on several occasions.
- (dis)satisfaction or surprise: in the case of surprise, something unexpected has happened. If the writer notes that something has improved/worsened, you tag (dis)satisfaction.
- dissatisfaction or anger: anger is the stronger emotion of the two. You can clearly infer from the text that the writer is expressing deep dissatisfaction. If irritation or frustration is clearly being communicated, you can also use anger. If the sentiment is tagged as being very\_neg, chances are that anger will apply, even though that is not always the case. When it comes to reinforced sentiments, always follow your feelings. In general, dissatisfaction will be more common.
- For example: anger is applicable here, because there is clearly frustration in the reinforced sentiment:

The supreme size is NOT a benefit , it 's a pain

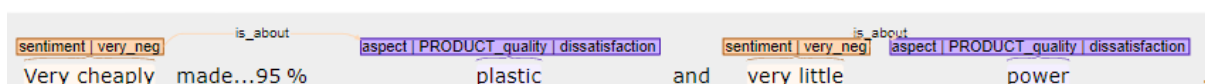
In this example, dissatisfaction is okay, even though the sentiment was reinforced. The writer is clearly dissatisfied, but there is no evidence of frustration or anger.



- dissatisfaction or sadness: sadness is the stronger emotion of the two. It is obvious from the text that the writer is expressing sadness and disappointment. If the sentiment is tagged as being `very_neg`, chances are that anger will apply, even though that is not always the case. When it comes to reinforced sentiments, always follow your instincts. In general, dissatisfaction will be more common. For example: sadness applies here because you can clearly feel disappointment in the heightened sentiment:



In this example, dissatisfaction is okay. The writer is clearly dissatisfied, but no disappointment or unhappy feeling is communicated, despite the increased sentiment:



### What should not be annotated?

Besides the situation in which a sentence does not contain any pairs of aspect and sentiment terms or some sentiment terms, there are other situations where no annotation is required.

- The wording is too narrative.

She had to wait for 13 hours in Brussels but she got to the destination eventually .

- The wording is not sufficiently explicit.

It 's definitely not meant for very large rooms or open concept areas , as it says in the description .



- The wording is too extensive or too long-winded.

Poor business for them , we and many other people will never travel with them again , they will disapear as they do n't have long term vision .

- The pair of aspect-sentence terms does not relate directly to the topic under discussion in the review. For example, because it refers to another airline/hotel/shop/etc. or draws a comparison with them. We call this 'out of scope'.

Unfortunately our Easter travel plan also got cancellations for flights with other companies like Vueling and Olympic / Aegean who reject to refund only offering credit vouchers .

- The emotion is not related to the interaction or experience with the company under discussion in the review.

At the beginning of 2010 sadly my wife was diagnosed with Breast Cancer .

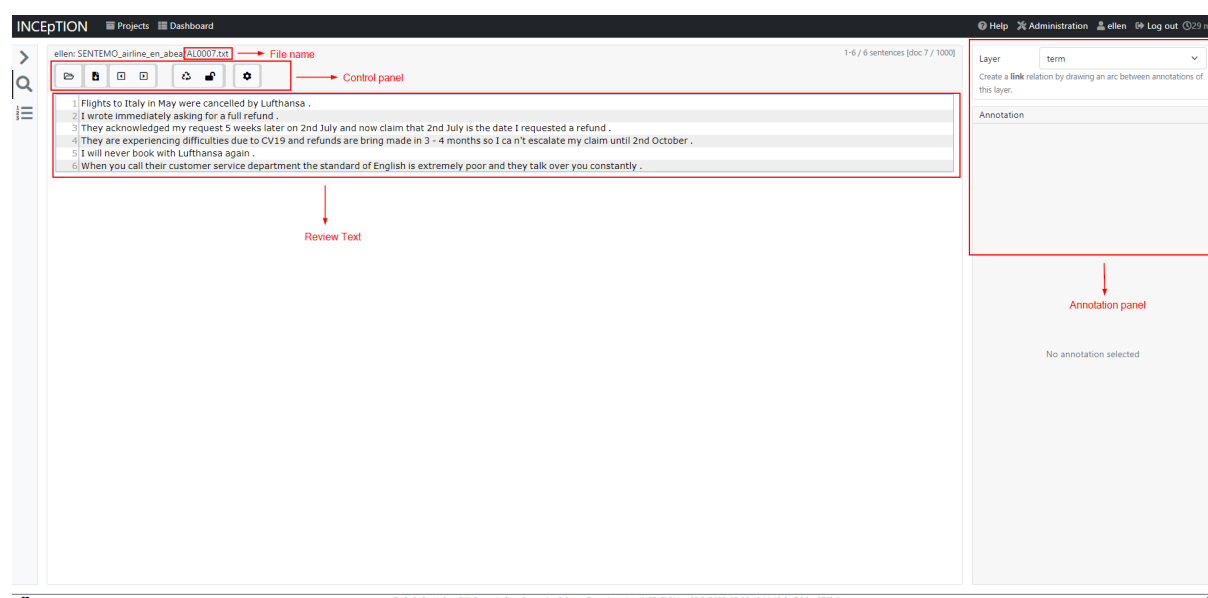
NB: Terms that contain spelling or language errors, to the extent that the word or meaning can still be deduced, **should** be annotated. This is a frequent occurrence.

### III. ANNOTATION IN INCEPTION

#### How do I start an annotation in INCEption?

1. Go to <http://inception.lt3.ugent.be/> and log in with your username and password. You will find a list of all SentEMO annotation projects, ordered by domain.
2. Select the domain you want to work in. You will find a list of annotators.
3. Select your own name. You will find a list of documents. Each document contains one review. Documents you have already opened are marked in blue.
4. Select the document you want to work in. You will see the annotation interface in which the selected document is loaded. The document is displayed line by line.

#### How does the INCEption annotation interface work?



- Use the **control panel** to open files, go to the previous or next file, or navigate to pages in the file (**check that you have annotated all sentences in the file!**).

#### Shortcuts:

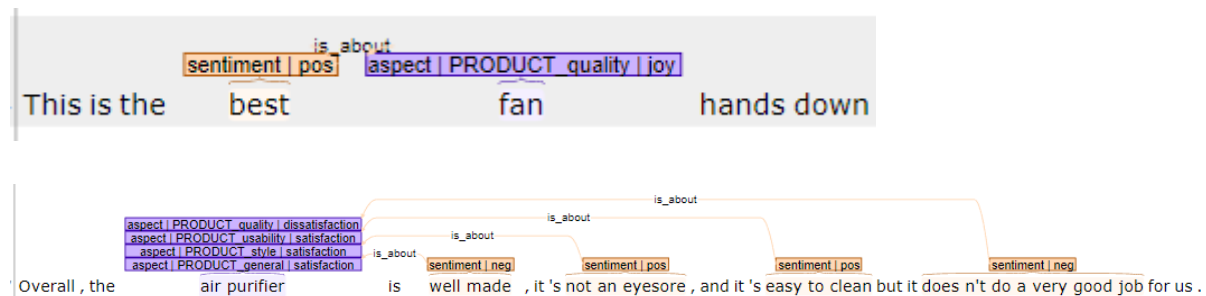
Key	Action
HOME	jump to first sentence
END	jump to last sentence
PAGE DOWN	move to the next page, if not in the last page already
PAGE UP	move to previous page, if not already in the first page
SHIFT+PAGE DOWN	go to next document in project, if available
SHIFT+PAGE UP	go to previous document in project, if available

- To start your annotation again, click on the recycle sign.
- The lock is to indicate that you have completed your annotation. This is redundant, so do not click on it.
- To adjust the number of rows that are displayed per page, click on the cog icon, and under General Display Preferences, adjust the page size.
- The **review text** is automatically split per sentence and displayed on a new line.

- In the review text, select the tokens you want to annotate.
- Use the **annotation panel** to tag your selections correctly.

### How do I annotate an aspect sentiment in INCEPTION?

The standard annotation form consists of an aspect, a sentiment and a link that connects the sentiment to the aspect. The terms that belong to the annotation are always newly tagged. A tagged term is therefore not used for more than one annotation.

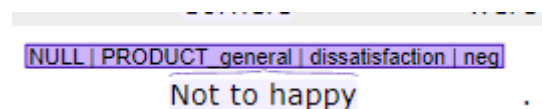


- 1. Check.** Before you start your annotation, read through the review to check for any inconsistencies.
  - a. Check whether the review is written in Dutch, and whether the sentences are split correctly. If this is not the case, make a note of the document name in the problem document under the tab ERRORS and skip the document for now.
  - b. Our data should not contain any private information, such as personal names, telephone numbers and addresses. Should you come across them, mark the tokens containing the information as follows:
    - i. In the annotation panel, select: *Layer* > anon.
    - ii. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
- 2. Layer.** To annotate pairs of aspect and sentiment terms, select *Layer* > term in the annotation panel.
- 3. Aspect.**
  - a. Determine a token or a set of tokens that cover the topic on which sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
  - b. Indicate in the annotation panel that you have selected an aspect: *asp/sent/null* > aspect.
  - c. In the annotation panel, indicate under which aspect category the topic falls: *aspect category* > [category].
- 4. Sentiment.**
  - a. Determine a token or a number of tokens in which the sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
  - b. Indicate in the annotation panel that you have selected the sentiment: select *asp/sent/null* > sentiment.
  - c. In the annotation panel, indicate the polarity of the sentiment: *sentiment polarity* > [polarity].
- 5. Link.**

- a. Click on the sentiment term and drag an arrow to the corresponding aspect term.
- b. In the annotation panel, indicate that you have linked the sentiment to the aspect: select *relation type* > *is\_about*.

### How do I annotate NULL in INCEPTION?

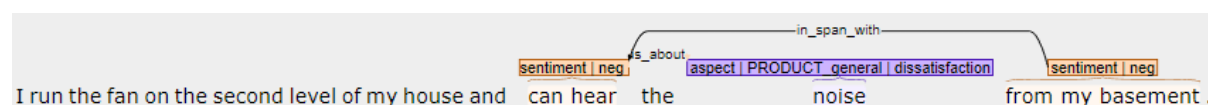
In some cases, a sentiment term has no corresponding aspect term (see: When should a NULL aspect be tagged?). In those cases, attach the full annotation to the sentiment term. Mark the annotation with NULL and determine the aspect category as precisely as possible.



1. **Layer.** To annotate NULL, in the annotation panel select *Layer* > *term*.
2. **NULL.**
  - a. Determine a token or a number of tokens in which the sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
  - b. In the annotation panel, indicate that you are annotating a NULL aspect: *asp/sent/null* > *NULL*.
3. **Aspect.**
  - a. In the annotation panel, indicate which aspect category the topic falls under: *aspect category* > *[category]*.
4. **Sentiment.**
  - a. In the annotation panel, specify the polarity of the sentiment: *sentiment polarity* > *[polarity]*.

### How do I connect tokens of the same term that are not adjacent to each other?

Sometimes tokens belonging to the same term are not directly adjacent to each other in the sentence.

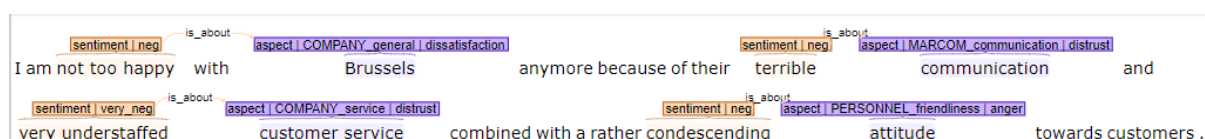


1. **Aspect and sentiment.**
  - a. Annotate sentiment and aspect as usual, without the *is\_about* link.
2. **Linking annotations.**
  - a. Identify the annotations that belong to the same term. Work from the beginning to the end of the sentence. The connection is like a chain: an annotation is connected to the next annotation, and then this annotation is connected to the next annotation.
  - b. Click and drag an arrow between the annotations.
  - c. In the Annotation panel, indicate that you have connected annotations of the same term: select *relation type* > *in\_span\_with*.
3. **Link.**

- a. Identify the last annotation that belongs to the term. Use that annotation to create the aspect-sentiment link.
- b. Click on the sentiment term and drag an arrow to the corresponding aspect term.
- c. In the annotation panel, indicate that you have linked the sentiment to the aspect: select *relation type* > *is\_about*.

### How do I annotate emotion in INCEPTION?

The emotion annotations build on the aspect-sentiment annotations. Each pair of aspect and sentiment terms or NULL term must be provided with an emotion tag. The emotion is associated with the aspect term or with the NULL term.



1. **Check.** Since you start from reviews of which the sentiment aspect terms and NULL terms should already be annotated, check whether all aspects are tagged in the review, and add where necessary. If you notice an emotion in a sentence, but a clear aspect is missing, you may indicate a long NULL term.
2. **Layer.** To annotate an emotion, in the annotation panel, select *Layer* > *term*.
3. **Emotion.**
  - a. Select an aspect or a NULL term.
  - b. In the annotation panel, indicate which emotion category most closely relates to the sentiment aspect term or NULL term: *emotion category* > [category].

### How do I indicate that I have doubts about my annotation?

If you are really unsure about a particular sentence, annotate your best guess. You can indicate your doubt by entering the document name and sentence number in the problem document under the tab CASES OF DOUBT. This will then be reviewed later.

### How do I save my annotation?

All your changes are automatically saved. As soon as you are finished, you can simply click INCEPTION away. You will be automatically logged out after 30 minutes of inactivity.