



**SENTiVENT**  
**Event Annotation Guidelines**  
**v1.1**  
Technical Report

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# Revision History

Revision	Date	Author(s)	Description
0.5	06.07.18	Gilles Jacobs	Create draft with incomplete typology.
0.6	12.07.18	Gilles Jacobs, Diane Breesch, Véronique Hoste, Els Lefever	Discuss event typology with finance domain-expert: Remove <b>Stock Holding</b> from typology because it is too rare an event.
0.7	02.08.18	Gilles Jacobs	Finish typology. Define event subtypes and participant definitions.
0.8	13.08.18	Gilles Jacobs, Véronique Hoste	Revise after review. Allow discontinuous spans which were previously disallowed. Refine typology. FILLER arguments are fully described in the typology. This version is used for annotator training and the first annotation test-run.
0.9	23.08.18	Gilles Jacobs, Diane Breesch	Add rule clarifications for annotator difficulties based on the annotation test-run. Majorly revise typology based on prof. Breesch domain-expert comments: Remove <b>CapitalReturns</b> type and <b>CapitalReturns_SharePurchase</b> subtype: Share repurchases are exceptionally rare in the corpus so it is pruned. This removes the need for the <b>CapitalReturns</b> main type. Add a <b>Dividend</b> type with corresponding subtypes previously as <b>CapitalReturns_DividendX</b> . Add <b>Expense</b> type and subtypes: expenses are often mentioned in corpus and together with <b>Revenue</b> and <b>Profit/Loss</b> form the three major factors in accounting. Renamed <b>FinancialResult</b> to <b>FinancialReport</b> : Specify that this event exclusively covers financial reports or trends in financial results of a company. Remove <b>Employment_Problem</b> because it is too broad and rare.
1.0	03.09.18	Gilles Jacobs	Clarify conceptual overlap and how to differentiate between event types. Clarify rules and add some examples. Add <b>In/DecreaseAmount</b> participant on <b>Revenue</b> subtypes. <b>This is the version used for the annotation and correction of the Sentivent English Event v1.0 corpus.</b>
1.1	10.01.19	Gilles Jacobs	Add Guidelines Enhancement Proposal chapter. Fix typos and added more examples from corpus.

# 1. Introduction

The SENTiVENT Event Annotation Guidelines aims to label economic events that appear in news text as well as the entities that participate in those events. Every news article contains mentions of news events, like a CEO change, a strike, the merger of two companies, etc. We defined a set of labels to mark these events and a set of procedures to guide annotators in their work.

The goal of the SENTiVENT research project is to enable supervised learning for event extraction and sentiment analysis for economic news. This requires a manually created gold standard dataset. For the purposes of SENTiVENT, an event in the business news-wire text domain are real-world occurrences that affect and involve companies. The primary goal of company-specific news is reporting changes in the current state-of-affairs regarding businesses and the economy. This is why automated event processing is a natural task for information extraction in this domain. Deals, employee changes, product launches, company mergers or lawsuits are some intuitive examples of what constitutes an event in economic news.

We annotate all events in the economic event typology described in [Chapter 6. Event Typology](#). We do not annotate event outside of the typology.

The SENTiVENT Event Annotation Guidelines are based on the Rich ERE annotation guidelines of the DEFT project as featured in the TAC-KBP Event and Entity tracks. Many elements and annotation rules are inherited from Rich ERE annotation, with some adaptations to fit the particularities of our research task. Different from DEFT Rich ERE is that we do not annotate Entities or Relations separately. We specifically grounded SENTiVENT Event Annotation Guidelines in the DEFT Rich ERE Event [\[1\]](#) and [\[2\]](#) Argument Filler guidelines.

There are however significant differences in the purposes of the DEFT project and ours. Rich ERE annotation is documented in [\[3\]](#) and [\[4\]](#) provides an overview publication. [\[5\]](#) details event annotation in ACE, the predecessor of ERE. The examples used in this document are original or sourced from research data.

One of the main difference with Rich ERE is that we only do not tag entities separately, i.e. any text span that describes an event argument within the extent is tagged. Rich ERE in contrast requires the more strict Argument Entities which are entity classes within the scope/extent of the current event. (We do however make the Rich ERE discrimination in extent for pre-determined set of Argument FILLERS which are bound to specific event types) Our approach is more similar to a frame semantic parsing task. Rich ERE uses the entity information because it has it at hand for other entity-related task.

Below, we present a summary of the annotation workflow. [Chapter 3. Event Trigger and Type](#) details the annotation procedure for events and [Chapter 4. Event Arguments](#) for event arguments. [Chapter 5. Event Coreference](#) shows how to perform entity and event coreference.

## 1.1 Sentivent Goals and Task

The goal of this annotation scheme is to produce a gold-standard labeled dataset for enabling supervised event extraction in the company-specific news text domain. Automated event processing is of interest in information extraction for many applications as one of the most important functions of language is communicating changes in the world.

The task is highly similar to the Rich ERE annotation scheme with the major difference that event arguments are not restricted by entity type. Entity types are not annotated. This make the task more

similar to frame semantic parsing: The ACE/ERE-like task that we wish to enable in the economic domain with this dataset are: - Event nugget detection (): extract tuples of (event trigger token-span, event type, event subtype, realis). This is the shared task in the TAC-KBP 2014 event track [6]. In comparison with other event conceptualizations such as [7] names this the Event Nugget conceptualization in DEFT Rich ERE: unlike ACE or Light ERE, Rich ERE allows for discontinuous and multi-token spans but are discouraged. - Event argument detection: extract for events the roles filled - Event nugget linking: Co-reference resolution based on events that semantically but not structurally (i.e. in arguments) refer to the same event instance. This conception of event co-reference corresponds to ERE event hoppers.

## 1.2 Workflow Overview

Keep the guidelines at hand. When any doubt arises during annotation, refer to the guidelines. The annotation procedure for events in a set of news text sentences can be summarized as follows:

1. Read the full article once.
2. If there are any problems with the quality of the article text:
  - (a) Make an Annotation Issue Ticket on the team communications system (Slack). Copy and past the document identifier at the top of the WebAnno annotation window (e.g., `celg03_waltham-based-dragonfly-inks-collaboration-with-celgene-bags.txt`).
  - (b) Skip this article and move on to the next one.
3. In each sentence:
  - (a) Detect and annotate event triggers.
  - (b) Examine the annotated trigger extent (the token span) for correctness: annotators will have to delete the full event structure if annotators want to edit this later, so it is of utmost importance this is correct before continuing.
4. For each trigger:
  - (a) Determine event type, subtype, and factuality.
  - (b) Look in the sentence for Participant and FILLER arguments as required by the Event Typology. For Participant arguments take into account Event Mention Scope.
  - (c) Annotate the entities that serve as arguments (if any are present). Remember Event Mention Scope for Participant arguments.
  - (d) If a Participant argument is pronominal, add a canonical mention coreference link to that Participant argument.
  - (e) Ensure you reviewed all slots and features in the tagging interface and you have not missed an annotation unit.
5. Perform event coreference: chain together events that intuitively refer to the same occurrence across the document.
6. Re-read article and examine annotations on correctness. Make adjustments where needed.

## 1.3 Practical Guidelines on Annotation and Article Content

- We encourage annotators to use search engines when they need to know more about a specific topic, company, ticker symbol, term, or other topics being discussed. [subsection 1.3.2. Economics and Finance Primer](#) contains suggestions for economics and finance resources for information look-up.
- Annotators should at all times highlight any doubts regarding the annotation scheme and ask the supervisor for clarification. There are no stupid questions!
- Keep the guidelines and typology handy during annotation and familiarize annotatorsrself thoroughly with the guidelines and typology properly before beginning.

- The first line of the article is always the title. We annotate the title as we would the body.
- Annotators should advise the supervisor any issues and problems with the annotation tool and/or text on the team communications channel (Slack).
- Sentences that have no final punctuation but are followed by a full sentence are highly likely section titles of the article. These need to be annotated too.

### 1.3.1 Webtools Used in Annotation

- Google Form for collecting annotator info:

This form is to be filled by all annotators for the purpose of academic reporting on annotation quality. All data collected remains confidential, anonymous, and is not to be published.

url: <https://goo.gl/forms/0ZZvA6nG4pWQJ1le2>

- Annotation tool WebAnno v4.3.5:

WebAnno is the annotation web tool in which all annotation work will be done. Use Chrome Browser to run WebAnno.

url: <http://webanno.lt3.ugent.be/welcome.html>

username: anno\_XX where XX is annotatorsr designated number.

password: lt34nn0

Known bug: switching between annotation layers from the top drop-down menu sometimes does not work. Annotators should try to never leave the primary **a\_Event** layer unless for annotating canonical referents of pronominal Participant arguments in the **b\_Participant** layer. Annotators can fix this issue by re-selecting the previously selected layer annotators moved away from.

- Collaboration channel Slack:

Slack is an online chat-based collaboration environment for announcing issues in the annotation process and resolving annotation uncertainties. Annotators are to make an account before beginning annotation using their institutional email address.

url: <https://lt3anno.slack.com/>

Report any problems with the quality of the article text and annotation tool bugs, such as:

- Garbage strings and tag remainders from article website metadata.
- Missing sentences or other content making the article incoherent.
- The article contains a lot of figures and is automatically generated.
- Any other issue that makes annotators feel the article is not human-written, complete or readable article.

1. Make an Issue Ticket on the team communications system (Slack) by typing `zendesk create_ticket`. Copy and past the document identifier at the top of the WebAnno annotation window (e.g., `celg03_waltham-based-dragonfly-inks-collaboration-with-celgene-bags.txt`) in the ticket field and explain your problem.
2. Skip this article and move on to the next one.



### 1.3.2 Economics and Finance Primer

This section serves as an introduction to the economic topics discussed in the news articles. It is unlikely our annotators are professional economists or securities investors hence training is needed. This primer clarifies some of the concepts and terminology you will encounter. We cannot provide an exhaustive list, so we provide pointers to resources for information on economic topics. We urge annotators to look-up companies, their subsidiaries, core-business, using these resources and general-purpose search engines.

#### Resources

For an overview of a company or corporation, all of its subsidiaries (daughter companies) can be found at:

For general terminology, we advise to use a general purpose search engine. Prioritize Wikipedia and Investopedia results.

Glossaries explaining economic, financial, and investing terminology:

- Brief, recommended reading:  
<https://am.jpmorgan.com/us/en/asset-management/gim/adv/glossary-of-investment-terms>
- <https://www.theguardian.com/business/glossary-business-terms-a-z-jargon>
- Investopedia dictionary (extensive): <https://www.investopedia.com/dictionary/>
- Financial Times Lexicon: <http://lexicon.ft.com/>

Wikis for economics and finance:

- Investopedia contains a vast curated resource of financial knowledge. Use it:  
<https://www.investopedia.com/search/>

### 1.3.3 Annotator Peer Review

Once annotators are sufficiently trained, peer resolution of issues will be enabled. In this process, annotators examine and verify problematic annotations of other annotators. Corrections are made when needed possible.

## 1.4 Financial reporting: the income statement event types.

Many business news articles discuss a company's financial state using several metrics that describe financial performance. Usually the company itself or a third-party (such as an auditor, fund or an analyst) releases financial statements which the media reports on.

A commonly discussed statement is the income report: An income statement or profit and loss account (also referred to as a profit and loss statement (P&L), statement of profit or loss, revenue statement, statement of financial performance, earnings statement, operating statement, or statement of operations) is one of the financial statements of a company and shows the company's revenues and expenses during a particular period. It indicates how the revenues (money received from the sale of products and services before expenses are taken out, also known as the top line) are transformed into the net income (the result after all revenues and expenses have been accounted for, also known as net profit or the bottom line). The income statement shows investors and managers whether the company made or lost money during a certain period.

In [Chapter 6. Event Typology](#), we define several types that are reported on the income statement **Revenue**, **Profit/Loss**, **SalesVolume**, **Expense** and one general type: **FinancialReport**. For each event in [Chapter 6. Event Typology](#), we discuss the differences between these types and other types where conceptual overlap is likely. Please take careful notes of these differences.

### 1.4.1 Cash flow vs. income statement

Cash flow statements are reports that describe the incoming and outgoing capital of a company. A cash flow statement is a simplified representation of a business's current financial standing. Accounting departments prepare these statements to give management and investors a clear and concise picture of their aggregated financial transactions.

While cash flow is sometimes discussed in economic reporting (e.g., as Free Cash Flow (FCF), etc.), we do not include specific types in the typology because they are relatively rare. Generally, you tag these types as **FinancialReport**. Sometimes when discussing cash flow, a concrete transaction is discussed relating to **Revenue**, **Financing** or **Investment**. If the focus is on the cash flow and not an event of type **Revenue**, **Financing** and **Investment** then **FinancialReport** is tagged, otherwise tag the corresponding specific type.

See also: Income vs. cash flow statement: [https://en.wikipedia.org/wiki/Cash\\_flow\\_statement](https://en.wikipedia.org/wiki/Cash_flow_statement)

## 2. Terminology and Typography

### 2.1 Basic Concepts and Terminology

**Event** A description of a change in the state-of-affairs that involves prototypical participant arguments.

**Mention** a span of words (tokens) corresponding to a specific annotation unit, i.e., event, Participant or Filler argument.

**Extent** The textual boundaries (start and end) of a linguistic expression associated with an Participant or FILLER argument. The string of text we annotate to indicate a concept. The extent rules described in these guidelines define restrictions on linguistic constructions (e.g. Noun Phrase, Prepositional Phrase, Pronoun, Proper Noun, Noun, etc.) that are allowed for that category. Extent is different for Participant and FILLER argument.

**Taggability** The rules and circumstances in which a running full-text mention is tagged.

**Event trigger** The token (or multiple tokens) that evokes the event of a certain `Type_Subtype`.

**Event mention scope** The textual scope from which arguments and attributes are tagged for a specific event mention. The event mention scope definition specifies the start and end of a specific event mention in the document.

**Event argument** Arguments describe the entities involved in an event. An event takes place and multiple persons, companies or organizations have certain prototypical roles in that event.

**FILLER argument** A FILLER argument gives descriptive information about an event. This is the Rich ERE equivalent of "Argument FILLER".

**Participant argument** A participant argument is a prototypical participant role in an event. It captures who or what is involved in a specific relation to the event. This is the Rich ERE equivalent of "Event Participant Argument".

**Event mention** An instance of an event in full-text annotation.

**Argument mention** An instance of an argument in full-text annotation.

**Coreference** occurs when two or more expressions in a text refer to the same person or thing; they have the same referent. Two event or entity mentions are coreferent when they refer to the same event or entity conceptually.

### 2.2 Typographical Conventions

We lay out some typographical signifiers for consistency and ease of reading:

In *sentence examples*: Full underline shows the event Participant arguments or potential Participant argument candidates. Dashed underline shows the FILLER arguments or candidate FILLER arguments. When discussing mention extent [ square brackets ] are used to highlight the correct delimitation of the mention span. **Bold** indicates the event trigger.

**Event tables** take the following form:

Type.Subtype of event	"event trigger token span"
EventParticipantArgument in CamelCase	"Participant argument token span"
FILLERARGUMENT in ALLCAPS	"FILLER argument token span"

e.g.,

- (1) *The FDA **approved** the medicine submitted by Johnson&Johnson in 2013 and it was **launched** in February 2016.*

→	Product/Service_Approval	"approved"
	Approver	"FDA"
	Owner	"Johnson&Johnson"
	ProductService	"the medicine"
	TIME	"2013"

"approved" triggers ProductService.Approval event with Owner Participant argument "Johnson&Johnson", ProductService Participant argument "product line", Approver Participant argument "FDA", and FILLER argument TIME "2013"

→	ProductService.Launch	"launched"
	ProductService	"it"
	TIME	"February 2016"

"launched" triggers event ProductService.Launch ProductService Participant argument "it" and TIME FILLER argument "February 2016".

# 3. Event Trigger and Type

This chapter describes the annotation of events, argument FILLERs and event co-reference.

## 3.1 What is an Event?

### Conceptually: events in economic news

An event is a textual description of a real-world occurrence of a certain change that involves multiple Participants. Generally, it describes a change of state-of-affairs in the world. These state of affairs can be described as being in the past, future, or present. Events have inherent temporality: they occupy a specific duration or point in time. An event describes what has happened, who was involved, at what time, in which place.

For the purposes of SENTIVENT, an event in the business news-wire text domain are real-world occurrences that affect and involve companies. The primary goal of company-specific news is reporting changes in the current state-of-affairs regarding businesses and the economy. This is why automated event processing is a natural task for information extraction in this domain. Deals, employee changes, product launches, company mergers or lawsuits are some intuitive examples of what constitutes an event in economic news.

### Technically: Features of an Event

Technically, an event is always described explicitly in the text: First, the presence of an event is indicated by a lexical **trigger**. Second, each event belongs to a certain **Type** and optional **Subtype**. Events outside the typology are not tagged. Annotators first tag the main type of an event and subsequently tag the subtype. If a subtype cannot be assigned because its description is a bad fit, the subtype will not be tagged.

We count 18 types and 43 subtypes (see appendix [Chapter 6. Event Typology](#)). Third, we want to find the arguments (people, companies, products, etc.) that participate in the event. Fourth, we give the event a **realis** value that indicates if the event has actually happened or not. We also perform event co-reference to link event mentions to each other if they refer to the same event.

In the following sections, we explain these elements in detail.

**We do not annotate events outside of the event typology.**

**Types are required but selecting subtypes is optional:** do not select a subtype when it is a bad fit for the event being described. Absence of a subtype on an annotated event denotes an "Other" subtype.

## 3.2 Event Triggers

The trigger of an event is the **minimal span of text** (a single word or a small phrase) that most succinctly expresses the occurrence of an event. It is often the main verb describing an action or a state. Generally, we think of the trigger as the word that most strongly refers to an event. In the examples below (and throughout this document), event triggers are **bold**. We also indicate the **type** and **subtype** of most events in the example sentences.

- (2) *On Monday, shares of biopharmaceutical company Celgene **tumbled**.*  
→ the verb **tumbled** is the trigger of a `SecurityValue_Decrease` event.
- (3) Noun: *[...] AA's exclusive airline **sponsorship deal** with the World Series champion Cubs.*  
→ the noun **sponsorship deal** is the trigger of a `CSR/Brand` event.
- (4) *Viscen is revealed to be the **buyer** of the ACX directories.*  
→ the noun **buyer** is the trigger of a `MergerAcquisition` event.

### 3.2.1 Event Trigger Extent: What Forms Do Event Triggers Take?

As examples 2 and 3 show, the trigger can be a **verb**, but also a **noun**, **pronoun** or a past or present **participle** or **adjective** in modifier position.

- (5) Verb: *The FDA did not **approve** JNJ's new medicine.*
- (6) Noun: *The **acquisition** of ACX went over without a problem.*
- (7) Adjective: *The **convicted** executive has made many enemies among the board.*
- (8) Past-participle: *The company was **litigated** against on grounds of workflow safety violations.*

**Resultative events:** We typically think of events as processes or actions; but we also tag states that result from taggable events. As shown by the examples below, resultative events can be predicate adjectives, participles used as modifiers or even present participles that denote an action currently in progress.

- (9) Predicate adjective: *The firm is **fined**.*
- (10) Nominal modifier adjective: *The **fined** firm has to pay a significant sum.*
- (11) Present participle: *The firms are currently **merging**.*

As resultative states these examples can be paraphrased as "the state of having gone bankrupt" or "the state of having been merged". Always tag both on-going events and resultative events.

**Event nominalizations and pronominalizations:** Nominal events can also occur as premodifiers in a noun phrase. In this case, only the noun that refers to the event is tagged:

- (12) *Quaker Oats rejected PepsiCo's **takeover** offer as too low.*  
→ `Merger/Acquisition`
- (13) *In April of last year, the CR Company began **litigation**.*  
→ `Legal_Proceeding`
- (14) *Biogen's Alzheimer drug began the clinical **testing** phase.*  
→ `ProductService_Trail`

Anaphors of events such as **pronouns** and **definite descriptions** of previously mentioned events are also tagged.

- (15) Pronoun: *The firm was **fined**. **It** was a great loss for many of the early-stage investors.*  
→ pronoun **It** refers to a previous `Legal_Conviction` event and is tagged.
- (16) Definite noun phrase: *Amazon **launched** its own smartphone. **It** was a festive **affair**.*  
→ pronoun **It** and definite noun **affair** refers to a previous event `Product_Launch`.

Anaphoric triggers, i.e. **it** and **affair** do not require arguments. They are the same type and subtype as the event they refer.

### 3.2.2 Complex Triggers: Finding the Right Words

Identifying the trigger of events is often straightforward, as in example 2 above. Just as often, we find a number of words that could be marked as a trigger, or an event is described in such a way that picking a single word as a trigger does not feel right. **As a rule of thumb, we keep triggers as small as possible** without it losing its event type or subtype meaning. In this section, we describe procedures to find the right trigger when it is not obvious.

Practically, annotators read the full article text using the event typology as a guiding reference. During first reading(s) they note possible events mentioned in the article. We advice annotators to focus on identifying types first and only assign subtypes after triggers have been found.

Next, they attentively go over the article a second time and look for the lexical triggers. Noting the triggers, annotators double check their spans.

#### Picking a word from multiple possible trigger words

There may still be situations where you can reasonably identify multiple different words for a single event trigger. We provide a few rules in these cases to avoid confusion. As a general rule-of-thumb: Always select the smallest meaningful lexical unit as an event trigger.

However, keep in mind that words that determine the event subtype should also be tagged.

- (17) *Foo Corp. 's services business **grew** \$ 2 Million in **revenue** .* (aapl s01)

→ the noun "**revenue**" denotes a **Revenue** main event type. However the verb **grew** specifies that the subtype is **Revenue.Increase**. Because the verb **grew** denotes an increase in the revenue, it is central to determining the event subtype. In WebAnno, you can tag trigger tokens that are separated with the "Discontiguous\_trigger" feature on the main type trigger.

- (18) *That lets the chain obtain the item at a lower cost , letting it sell it for less money , likely at the same or a greater margin .* (wmt03 s23)

→ the noun "**revenue**" denotes a **Revenue** main event type. However the verb **grew** specifies that the subtype is **Revenue.Increase**. Because the verb **grew** denotes an increase in the revenue, it is central to determining the event subtype. In WebAnno, you can tag trigger tokens that are separated with the "Discontiguous\_trigger" feature on the main type trigger.

**The Stand-Alone Noun Rule:** In **verb+noun** constructions, we will simply select the noun whenever that noun can be used by itself to refer to the event. If the verb+noun cannot be reduced without losing the event meaning multiple words will be tagged.

- (19) *Foo Corp. has previously released great results on their **10-K** in 2016.*

→ the noun "**10-K**" - not verb+noun *released 10-K* - is the trigger as per the Stand-Alone Noun Rule. (A Form 10-K is an annual report required by the U.S. Securities and Exchange Commission (SEC), that gives a comprehensive summary of a company's financial performance.)

- (20) *The company had to pay a **fine** of 300.000EUR.*

→ the noun "**fine**" - not verb+noun *pay a fine* - is the trigger as per the Stand-Alone Noun Rule.

**Stand-Alone Adjective Rule:** In **verb+X+noun** constructions, when a verb and an adjective are used together to express the occurrence of an event, the adjective will be chosen as the trigger whenever it can stand alone to express the resulting state brought about by the event.

(21) *The negative findings left 3 projects **disapproved**.*

→ the **adjective disapproved** not verb+X+adjective *left 3 projects* is the trigger as per the Stand-Alone Adjective Rule.

**Main Verb Rule:** When several verbs are used together to express an event, only the main verb is the trigger. Auxiliary verbs or main verbs of which the event trigger is the complement are not part of the event trigger.

(22) *XYZ Corp. announced **laying off** 37 workers in the Chicago facility.*

(23) *John D. Idol will **take over** as Chief Executive.*

(24) *XYZ Corp **laid** Jane off.*

(25) *John D. Idol had **taken** the company over.*

**Contiguous Verb+Particle/Verb+Adverb Rule:** In verb+particle and verb+adverb, constructions we will tag main verb and particle together. If they are discontinuous, i.e., interrupted, we annotate the verb with its particle or adverb using a discontinuous span relation annotation in WebAnno.

(26) *Jane was **laid off** by XYZ Corp.*

(27) *John D. Idol will **take over** as Chief Executive.*

(28) *XYZ Corp **laid** Jane **off**.*

(29) *John D. Idol had **taken** the company **over**.*

### 3.2.3 Multiple Events within a Sentence

Do not confuse cases where there are multiple possible triggers for the same event within the same sentence with cases where there multiple different events expressed in the same sentence. Multiple events can be expressed in the same sentence.

This usually both in complex sentences, i.e. with coordinated (*and, or, but, for, etc.*) and subordinated (if, that, because, where, etc.) clauses. But also in simplex sentences consisting of one clause.

(30) *The **product launch** caused a rise in **revenue** and **sales**.*

(31) *John D. Idol will **take over** as Chief Executive and Bertrand Locke will **step down**.*

Sometimes multiple events are triggered by adjectives sharing the same verb. Tag each adjective as a separate event.

## 3.3 Factuality

Event factuality captures the factual nature of the occurrences mentioned in the text. The author expresses if the event corresponds to a fact, a possibility or a situation which is not true. We define factuality labels along two axes: Modality (Certain vs. Other) and Polarity (Affirmed vs. Negated). Polarity captures whether an event mention is affirmed or negated. Modality captures the degree of certainty (i.e., epistemic modality) about the event being the case as expressed by the author or other source.

The factuality value is a matter of perspective and always depends on a source: in written text this is the author by default, but other sources can be introduced by using quotation or paraphrasing. We do not annotate the source.

Some examples of events with different combinations of Modality and Polarity:



- (32) *Amazon's workforce **surged** 66 % last year , to 556,000 nationwide.*  
→ The **Employment.Start** event certainly took place according to the author.  
→ Factuality label: **Certain** modality, **Positive** polarity.
- (33) *The Seattle Times reported Monday that the tech giant was **cutting** hundreds of jobs at its Seattle headquarters.*  
→ The **Employment.End** event certainly takes place according to the explicitly mentioned source (The Seattle Times).  
→ Factuality label: **Certain** modality, **Positive** polarity.
- (34) *The 3bn euro acquisition of VNU's directories business by Apex and Cinven did not go through in 2014 .*  
→ The **Merger/Acquisition** event certainly did not take place. The author does not express uncertainty about the fact that the event did not take place.  
→ Factuality label: **Certain** modality, **Negative** polarity.
- (35) *With Express Wi-Fi , Facebook hopes to bring more Indians online and also empower more Indian businesses that could **become advertisers** on the site .*  
→ The **SalesVolume.Increase** event is uncertain and is a not negated according to Facebook: Facebook thinks it is probable that a **SalesVolume.Increase** event will take place.  
→ Factuality label: **Other** uncertain modality, **Positive** polarity.
- (36) *Regulators even raised the possibility that Duke would abandon the proposed **construction** of the Lee Nuclear Station .*  
→ The **Facility.Open** event is uncertain and the opening is negated: It is a possibility that a **Facility.Open** event does not take place.  
→ Factuality label: **Other** uncertain modality, **Negative** polarity.

For **modality**, there are two possible values: Certain and Other.

**Certain** Certain events are asserted by the author as lacking any uncertainty. According to the author, the event certainly has (not) happened, is (not) happening or will (not) happen in the future. These are events that are believed to be true. The source/author expresses certainty by not using explicit or implicit expressions to signal that the event is possible, probable, likely, impossible, improbably, unlikely or otherwise has any degree of uncertainty. Most events you will find are Certain. Certain is the default value and does not have to be annotated.

Note that future events are often presented as Certain as the author is certain something will take place in the future. The use of future tense does not automatically cause an uncertainty Other label.

**Other** Other events have a degree of uncertainty: the label captures all event factuality labels that are different from certain: probable, possible or likely events and improbably, impossible or unlikely events. The author indicates it is a possibility, probability or likelihood that the event takes place or does not take place. These can be realized by epistemic modality markers such as verbal auxiliaries (must, may), adverbials (probably, possibly, presumably), and adjectives (likely, possible). In many cases, epistemic modality will be conveyed by verbs with the event as complement (e.g., "think", "want", "wish", "hope", "speculate", "propose", *The company wants to **fire** its factory line workforce.*)

The Other label also includes cases in which the author signals that he does not know the certainty level or does not commit to it.

There are **polarity** two polarity values: Positive and Negative.

**Positive** is for events that are not negated. These events are typically realized as part of affirmative sentences. This is the default value in annotation and does not have to be annotated.

**Negative** is for events that are negated. By using negation the source asserts that the event did not take place, is not taking place or will not take place. The event trigger has to be under the scope of the negation. Negation can be realized in many way in English: adverbs ("not", "neither", "never"), determiners ("no", "none"), verbs ("deny", "prevent", "negate"). In many cases, negation will be conveyed by verbs with the event as complement (e.g. "They prevented the **sale** of the company., The board avoided the **litigation** by settling out of court.)

**Certain + Positive** According to the source, it is **certainly** the case that X.

**Certain + Negative** According to the source, it is **certainly not** the case that X.

**Uncertain + Positive** According to the source, it is **probably/possibly/unknown** the case that X.

**Uncertain + Negative** According to the source, it is **probably not** the case that X.

**Other Discriminative Test:** To test if events are in the Other category, you can add an opposite polarity context: Other uncertain events can at the same time be possible in a context of opposite polarity:

(37) *It is speculated that Amazon is laying off hundreds of workers [...]* (Other + **Positive**)

→ ... but it is possible that they will not lay off hundreds. (Other + **Negative**)

(38) *The employee count is not likely to rise higher around the holidays.* (Other + **Negative**)

→ ... but it is possible that will rise higher.

Certain events cannot at the same time be possible in a context of opposite polarity without the author contradicting themselves:

(39) *Amazon is laying off hundreds of workers [...]* (Certain + **Positive**)

→ #!... but it is possible that they will not lay off hundreds. (Certain + **Negative**) -> Contradiction.

(40) *The employee count will not rise higher around the holidays.* (Certain + **Negative**)

→ #!... but it is possible that it will rise higher. (Certain + **Positive**) -> Contradiction.

In our SENTIVENT corpus, the most common categories are **Certain + Positive** and **Uncertain + Positive**. **Uncertain + Positive** seems to be possible more common than in other reporting genres due to the forward future facing character of financial forecasts, investment advice, etc., however we did not quantitatively check this. Due to the news reporting genre positive polarity is used to assert events, possibly because events that did not happen are not good material to be reported on.

### 3.4 Dealing with Quotations

We annotate inside a quotation the same way we annotate outside of it. We do not consider the quotation to be a separate sentence. That means it is possible to identify an event outside a quotation and annotate arguments for that event inside of it, and vice-versa.

(41) *The CEO announced that J. Peterson will be **replaced** swiftly.*

→ **Employment.End** with **Employer** Participant argument "The CEO" and **Employee** Participant argument "J. Peterson".

# 4. Event Arguments

This chapter describes the annotation of arguments of events.

## 4.0 Conceptually: Arguments in Events.

Events describe changing state in the world and encapsulate actions, relations, occurrences, etc. These involve multiple participating entities who are involved in one way or other: as agents (causers/initiators), patients (targets/undergoers, themes), qualifiers, quantifiers, specifiers and other descriptive modifiers. Examples are the person or company doing the action, the amount of shares involved or some other piece of information, like the place where the event happens.

Each event has a number of corresponding arguments. We label arguments for each event mention. For each event, **arguments fill a number of roles specific to the event type**. The `Conflict.Attack` event type, for instance, asks for an Attacker, a Target, an Instrument, a Place and a Time.

INSERT EXAMPLE

We distinguish between two types of arguments:

1. **Participant** arguments: these are the text spans describing a Participant that is involved in the event. For each type/subtype of event there is a specific set of Participant roles to be filled. [Chapter 6. Event Typology](#) describes what these slots are in detail.
2. **FILLER** arguments: FILLER arguments are non-central arguments in the event but provide descriptive and discriminative information. They denote the the time, place, title, age, crime, commodity attached to an event. They serve as extra but vital information in characterizing the event. FILLER arguments differ from Participant in two ways: i) they are not bound by event scope mention and can be tagged anywhere in the document. ii) They have to be full Noun Phrases (NP), unlike Participants that can be anaphoric pronouns. For FILLER arguments, the closest full NP mention will be tagged instead.

## 4.1 Technically: Taggability of Arguments.

Here we explain the general technical rules for tagging event arguments that **apply to both Participant and FILLER arguments**. Most important are trigger proximity and the possible absence of arguments.

**Argument slots can be left empty** if the relevant argument is not mentioned in the sentence. It is possible that some events have no explicit arguments in the sentence: their entire argument list is empty. We expect event triggers with empty arguments to be a rare, but they can occur when Event Mention Scope is violated:

(42) *Disney **premiered** its new movie Frozen. The **release** received universal praise.*

→	Product/Service_Launch	"release"
	Owner	
	ProductService	

→ "release" triggers an `ProductService.Launch`, conceptually the `Owner`

**Shared Argument Rule:** A candidate argument mention is always annotated when it is also an argument in a different, non-coreferent event (cf. 43, 44). Arguments that are shared between events are not annotated when they fall out of Event Mention Scope: the shared argument then is within the scope of an earlier, co-referent event and is not tagged (cf. 45). On the reverse arguments of coreferent events are not annotated when they are not explicitly realized by a different token span (cf. 46).

Events can be related and similar, but not coreferent: Non-coreferent events do not have the same `Type.Subtype` or do not refer to same exact event instance. For Participant argument, this does not violate the event mention scope boundary and Participants can be tagged.

In these examples, the over- and underlined argument should attach to both different event mentions in **bold**:

- (43) *The FDA **approved** the medicine submitted by Johnson&Johnson in 2013 and it was **launched** in February 2016.*

→	ProductService.Trail	"approved"
	Approver	"FDA"
	<u>Owner</u>	" <u>Johnson&amp;Johnson</u> "
	ProductService	"the medicine"
→	TIME	"2013"
	ProductService.Launch	"launched"
	<u>Owner</u>	" <u>Johnson&amp;Johnson</u> "
	ProductService	"it"
→	TIME	"February 2016"

→ The token span "Johnson&Johnson" is tagged as `Owner` participant role in both events with the `Owner` participant role because the two events are clearly not coreferent.

- (44) *Amazon will **open** a new distribution center in Glendale after securing a **tax abatement deal** with local government .*

→	Facility.Open	"open"
	<u>Company</u>	" <u>Amazon</u> "
	Facility	"a new distribution center"
	PLACE	"Glendale"
→	Deal	"tax abatement deal"
	<u>Partner</u>	" <u>Amazon</u> "
	Partner	"local government"
	Goal	"tax abatement"

→ The token span "Amazon" is shared between the `Facility.Open` and `Deal` with different participant roles because the two events are clearly not coreferent.

- (45) *Amazon will **open** a new distribution center in Glendale . **The opening** has caused political controversy .*

→	Facility.Open	"open"
	<u>Company</u>	" <u>Amazon</u> "
	Facility	"a new distribution center"
	PLACE	"Glendale"

- |                               |      |
|-------------------------------|------|
| Facility.Open                 | "it" |
| Coreferent with "open" event. |      |
- The Facility.Open events denoted by "opened" and "it" are coreferent. The participants denoted by "opened" are not tagged again for "it" because the events are coreferent.

- (46) Amazon will **open** a new distribution center in Glendale . **The opening** has caused political controversy for the ecommerce giant.

- |                |                             |
|----------------|-----------------------------|
| Facility.Open  | "open"                      |
| <u>Company</u> | " <u>Amazon</u> "           |
| Facility       | "a new distribution center" |
| PLACE          | "Glendale"                  |
- |                               |               |
|-------------------------------|---------------|
| Facility.Open                 | "The opening" |
| Coreferent with "open" event. |               |
| ccc                           | ccc           |
- The Facility.Open events denoted by "opened" and "The opening" are coreferent. Only the token span "the ecommerce giant" is a participant of the second "The opening" event because it is a differently expressed mention than "Amazon".

**Trigger Proximity Rule:** In complex sentences, a single argument to an event can be mentioned more than once. In that case, we annotate the mention that is **closest to the trigger**.

**Saliency Rule:** Exceptionally, an argument mention corresponds in meaning to two role slots of the same event. In this case, choose the most salient role. The most salient role is the one that is most important to interpreting the event and distinguishing it from other event types or subtypes.

- (47) The company **approved** the product line.
- "approved" ProductService.Approval with two plausible candidates as Participant arguments for "company" as specified in the event typology: **Owner** and **Approver**. The company is both the approving entity for the product and owner of the product.
- **Approver** is the correct Participant argument tag as it characterizes the event better.

**Embedded Modifier Referent rule:** We allow overlapping annotations in cases where a modifier of an argument itself refers to a taggable argument.

- (48) The law-firm is **litigating a class action lawsuit** against Ford Motor Company for [the recall of defective [Takata] airbags]. In turn, Ford is **seeking damages** for the faulty parts.

- |                  |  |
|------------------|--|
| Legal.Proceeding | "litigating a class action lawsuit"      |
| Defendant        | "Ford"                                   |
| Complainant      | "law-firm"                               |
| Adjudicator      |  |
| ALLEGATION       | "the recall of defective Takata airbags" |
- |                  |                    |
|------------------|--------------------|
| Legal.Proceeding | "seeking damages"  |
| Defendant        | "Takata"           |
| Complainant      | "Ford"             |
| Adjudicator      |                    |
| ALLEGATION       | "the faulty parts" |

- these are two distinct events in which [Takata] serves as the **Defendant** Participant argument of the second event while being a modifier of the first event argument filler.

**Coordinated Arguments Rule:** Multiple events can be started by one trigger when arguments are coordinated and they are clearly distinct events. However, argument coordination can also indicate one event with multiple arguments filling the same role. Often an enumeration of arguments with the same role is given for one event. In this case: Tag multiple participant arguments on the same event. These rules help you decide whether to tag **one event with multiple arguments** in the same role or **two separate events**:

1. If the TIME and PLACE FILLER arguments are different or there are separate times and places indicated for coordinated arguments, tag two separate events.
2. If any other Participant or FILLER argument is coordinated, tag a single event. In this case there will be multiple arguments filling the same event argument role.
3. If distinguishing between one or multiple events is too complicated, default to annotating a single event with multiple arguments.

(49) The motor manufacturer plans to launch a sedan and a hatchback in Korea.

	ProductService.Launch	"launch"
→	Owner	"The motor manufacturer"
	ProductService	"a sedan"
	ProductService	"a hatchback"
	PLACE	"Korea"

→ One event triggered by "launch" of type **Product.Launch** with two ProductService Participant arguments, one for "a sedan" and one for "a hatchback". The arguments are coordinated and have the same role but only one event is described.

(50) The motor manufacturer plans to launch a sedan in China and a hatchback in Korea.

	ProductService.Launch	"launch"
→	Owner	"The motor manufacturer"
	ProductService	"a sedan"
	PLACE	"China"
	ProductService.Launch	"launch"
→	Owner	"Johnson&Johnson"
	ProductService	"a hatchback"
	PLACE	"Korea"

→ Two separate events triggered by "launch" of type **Product.Launch** with one ProductService argument each. Because the launch takes place in two separate locations there are two distinct events (one in China and another in Korea) each with a different participant.

(51) The stock fell to 101.12 USD yesterday and today to 99.4 USD.

	SecurityValue_Decrease	"fell"
→	Security	"The stock"
	Amount	"101.12 USD"
	TIME	"yesterday"
	SecurityValue_Decrease	"launch"
→	Security	"The stock"
	Amount	"99.4 USD"
	TIME	"today"

→ Two separate events for trigger "fell" of type `SecurityValue_Decrease` because the event takes place in a different time ("yesterday" and "today") each with a single Amount participant.

**General Note on Argument Extent:** Your task is to find each taggable argument mention in the document, and label its extent that is, the string of text that refers to the argument as a potentially discontinuous span of tokens. Mention extents generally begin and end at word (token) boundaries.

However, possessive endings ('s) and verbal contractions (m, ve, re) should be excluded from the mention extent. These are treated as if they were separate tokens and are already tokenized in the annotation interface. As a rule, you should also exclude punctuation characters like commas, periods, and quotation marks unless the same entity mention continues after the punctuation mark.

## 4.2 Participant Taggability

We distinguish two types of arguments: Participant and FILLER arguments. This section discusses the annotation rules for Participant arguments. Their taggability is mainly different from FILLERs by the Event Mention Scope and their extent.

A Participant argument is any entity that participates in a taggable event mention. An entity is a unique object or set of objects in the world. For instance, a specific company, person, place, product or organization that is involved in the action of the event. A Participant argument mention is a single occurrence of a **name**, **noun phrase**, or **pronominal phrase** that refers to, or describes, a single Participant role. These specific Participant roles are listed in [Chapter 6. Event Typology](#).

**Event Mention Scope Rule:** We **only tag Participant argument mentions that occur within the event mention scope** for an event trigger. The event mention scope is defined as the span of a document from the first trigger of an event to the next trigger you see for the same, coreferent event.

Event mention scopes do not begin and end at the trigger words themselves, but at sentence boundaries: **The scope of an event spans to the start of the trigger sentence to the start of the next coreferent event.**

Note: this means not any next event but the next *coreferent* event, i.e. with the same **type** referring to the same conceptual event. (Event coreference is described in [Chapter 5. Event Coreference](#).) Non-coreferent events do not end the event mention scope.

Always tag arguments closest to the event trigger.

INSERT EXAMPLE FIGURE AS IN PAGE 31 of Rich ERE Event Guidelines.

This rule does not apply to Argument FILLERs. Unlike Participant arguments, FILLER arguments are not bound by event mention scope and can be tagged anywhere in the document. Always tag the closest FILLER argument mention to the event trigger as per Proximity Rule.

**We only annotate arguments to a taggable event.** We annotate events first, then look for the Participant role (or FILLER argument) that the event requires. If an entity does not have a role as an event argument, we do not annotate it.

### 4.2.1 Participant extent rules

Here we discuss the rules for selecting which tokens are allowed in annotation of a Participant argument. Special rules for argument extents apply depending on whether they are nominal or pronominal mentions.

**Nominal Participant arguments:** Nominal Participant argument mentions are realized by a noun or full noun phrase with constituents (NP). This means we tag the full NP with children for nominally realized Participants. Appositive and relative clauses are included as long as they are children/dependent of the argument NP. This has the potential for long token span arguments, but we expect overly complex NPs to be rare. Proper names, acronyms, nicknames, aliases, abbreviations, ticker symbols, or another alternate names are nominal Participant arguments. Names will be tagged since they constitute NPs on their own or are part of NPs and are not given special treatment.

In the following examples, the correct Participant extent is [ underlined and bracketed ].

- [ XYZ , another large company whose investors revolted ] underwent similar troubles.
- [ Bill Robertson , the youngest XYZ Corp. executive ], will step down...
- [ Apple 's former CEO Steve Jobs ] ' replacement was announced today.
- [ The Denver Broncos sports team ] entered into a sponsorship deal with [ XYZ Corp ].
- [ The company 's baseline ] will likely benefit from [ president Trump 's tax reform ] .
- [ Microsoft ] aka [ MS ] aka [ MSFT ] (ticker)
- [ Pharma giant Johnson & Johnson ] announced breakthrough results.
- [ Bill ] and [ Melinda Gates ]: see coordinated arguments.
- [ The company which earlier proclaimed the merits of this feature ] now admits to the scandal.

**Pronominal Participant arguments:** A pronominal argument mention is a referring expression that corresponds to a nominal or named entity. **The extent of a pronominal mention is just the single referring unit, typically a pronoun.**

Below is a list of English pronouns/pronominal mentions. Note that NPs starting with any of these words are not pronouns but NPs (e.g., "this bank", "the other board members", "few of the products" are nominal NP mentions). Pronominal usage is a requisite.

- |              |           |               |              |             |
|--------------|-----------|---------------|--------------|-------------|
| • all        | • herself | • much        | • someone    | • whatever  |
| • another    | • him     | • my          | • something  | • where     |
| • any        | • himself | • myself      | • that       | • wherever  |
| • both       | • his     | • one         | • their      | • which     |
| • each       | • I       | • one another | • theirs     | • whichever |
| • each other | • it      | • other       | • them       | • who       |
| • either     | • its     | • others      | • themselves | • whoever   |
| • everybody  | • itself  | • our         | • these      | • whom      |
| • everyone   | • little  | • ours        | • they       | • whomever  |
| • everything | • many    | • ourselves   | • this       | • whose     |
| • few        | • me      | • several     | • those      | • you       |
| • he         | • mine    | • she         | • us         | • your      |
| • her        | • more    | • some        | • we         | • yours     |
| • hers       | • most    | • somebody    | • what       | • yourself  |

**Reflexive pronouns** are arguments the same as other pronouns. However the pronominal argument can fill a separate role from its nominal referent in some special cases:

(52) The CEO was pressured into **firing himself**.

→ "fire" triggers **Employment.End** event with "The CEO" in the **Employer** and "himself" in the **employee** role.



**Relative pronouns** are tagged when they are the closest Participant argument mention to the event. This happens when the event trigger is part of a relative clause.

- (53) The manufacturer, which **laid off** 200 factory line workers in 2016, is now facing declining sales.  
→ "laid off" triggers **Employment**. End event with "which" in the **Employer** role.

## 4.3 Canonical Coreferent for Pronominal Mentions

When a pronominal Participant argument is tagged, we annotate a coreference link to the most canonical mention of that entity in the document. This does not necessarily mean that we annotate a coreferent link to the nearest nominal coreferent mention. We link to the mention that best identifies and uniquely characterizes the referent of the pronominal mention. The goal is to obtain a highly referential mention for that entity that uniquely identifies the pronominal argument mention in question.

The most canonical referent likely includes a proper name or is a definite, highly referential NP if a proper name is lacking in the document.

In the following example the canonical coreferent is shown in [ square brackets ].

- (54) [ Alphabet Inc. ] unveiled new information about their secretive "moonshot" research center "X". This fits in a recent trend of openness taken by the holding. The technology conglomerate which recently announced it is testing a drone delivery service has been more willing to lift the veil on ongoing projects.  
→ Alphabet Inc. is the most canonical mention for referent "it". Other coreferent mentions are "the holding", "The technology conglomerate", and "which", but "Alphabet Inc." is chosen because it is the most unique identifier of that referent.

Preference is given to proper names. If the proper name is part of an NP, tagging only the proper name suffices: there is no need to tag the full NP. When there are multiple plausible candidates, choose the coreferent nominal mention closest to the event trigger in the document.

This coreference link is annotated primarily to disambiguate the argument and not for full coreference resolution purposes.

**NOTE:** In annotation the annotators did not always follow this guideline strictly and tagged Canonical Coreferents with non pronominal mentions. In this case, the Canonical referent relation link is annotated on NPs when that NP is realized in a low-referential way.

E.g., "Amazon" ← "The company", "Facebook" ← "the social media giant"

### 4.3.1 Differences with Rich ERE entity extent

Named entities in Rich ERE are tagged as distinct of nominal entities. Even though proper names are constituent parts of a full NP they are tagged separately. We do not make this distinction as a simplification as we do not need the same entity level granularity as ERE. This removes the need for specifying rules for headless NPs, named+nominal combinations, and partitive constructions (e.g. "all of the board", "one of the companies").

Unlike Rich ERE, we also do not tag the head of the NP as a simplification. When needed in processing, we leave determining the head of the NP to syntactic dependency parsers. For relative clauses a distinction between specifying and non-specifying clauses would be useful, but we do not provide such annotations.

## 4.4 FILLER Argument Taggability

The FILLER argument extent is the string of text we annotate to indicate a FILLER argument. The rules for identifying the extent of a FILLER argument will vary from type to type. This information is given for each specific FILLER type in [Chapter 3. Event Trigger and Type](#).

Many FILLER arguments are mentioned by a noun phrase (NP). The extent of a FILLER argument is the entire NP unless otherwise specified for its type in [Chapter 6. Event Typology](#). When it is difficult to decide if modifiers should be included or not, the FILLER argument extent should be maximally inclusive. In the case of a discontinuous extent, the extent goes to the end of the constituent, even if that means including tokens that are not part of the constituent. For example:

- (55) The law-firm litigates **a class action lawsuit** against Ford for the bodged recall in 2018 of the defective Takata airbags.
- The extent of the ALLEGATION FILLER argument [the bodged recall in 2018 of the defective Takata airbags]<sub>ALLEGATION</sub> contains pre-modifiers "the bodged" and prepositional phrase "in 2018" and runs until "airbags". The mention of "the recall" being due to "defective Takata airbags" is essential to the description of the event.

The extent includes all the modifiers of an NP, including determiners, prepositional phrases, appositive phrases and relative clauses.

Unlike Participant arguments, we do not annotate pronominal mentions for FILLERs (e.g. "where" for PLACE and "when" for TIME) and tag the nominal mention closest to the event trigger. The specific FILLER argument types and their taggability are discussed in [Section 6.2. FILLER arguments](#).

**Connect all fillers in the document even of previous coreferent events.**

**Difference Participant and FILLER:** FILLER arguments' taggability differs from Participant arguments in two ways:

1. Participant arguments must be tagged within Event Mention Scope, FILLER arguments can be tagged anywhere in the document. Always annotate the closest mention as per the Trigger Proximity Rule.
2. Participant arguments can be pronominal, filler arguments must be nominal (unless otherwise specified in the typology).

# 5. Event Coreference

## 5.1 Event coreference definition

The final annotation step is that of linking coreferent events in the document. This means you annotate a link between event triggers that intuitively refer to the same real-world event.

The criteria for linking coreferent event mentions:

1. **Semantically and intuitively** refer to the same real-world event.
2. **Type and Subtype are identical.** Exceptionally, coreferent event are tagged as a certain main type but with an unspecified subtype. The subtype is later specified in the content of the text. In those cases the events are tagged as **coreferent if the Main type matches and one has no subtype.**
3. **Temporal and location scope are identical**, but the time and place expressions do not have to be exactly the same (e.g., *"The product launch in 2017"* and *"Last year's product release"*, *"The company opens its new headquarters in Detroit"* and *"the real-estate investment in Motor City"* use different expressions to denote the same point in time or space). The place and time do not have to be exactly the same but **correspond in scope** (e.g., *"six month ago"* and *"last year"* are in the same temporal scope, *"Canada and the US"* and *"North-America"* are in the same location scope). Time periods/points and locations are coreferent as long as they roughly fit into each other.
4. Not necessarily the same arguments: Argument mentions do not have to be identical. However, the referred arguments will roughly correspond in their referents. Arguments can be left implied, specified, or generalized but do not have to be exactly identical.
5. Not necessarily the same trigger.
6. Not necessarily the same Factuality.

Note that **events with same Type.Subtype and corresponding place/time are not automatically coreferent**: Annotators should always infer from context and meaning that they are indeed the same real-world event involving the same entities, persons, companies, etc. For example: *"XYZ Corp. ended their cloud computing service in 2017. [...] Last year they stopped their service contract with ABC Inc."* have the same **Product.CancellationRecall** type and subtype and are within the same temporal scope, but refer to distinct events by way of having clearly separate involved arguments.

Many events will not have coreferent events in the document.

## 5.2 WebAnno: Tagging coreference chains

In order to tag coreference effectively in WebAnno, the coreference step is left for last. The annotator reviews all tagged event types and evaluates for each event with same **Type\_Subtype** whether they are coreferent. Chains should be drawn in sequential order to avoid interface clutter: if event A, B, C are coreferent in the text and they follow each other sequentially, the arrows should be drawn  $A > B$ ,  $B > C$  and starting from the initial event not  $A > B$ ,  $A > C$ . The direction of a coreference relation does not matter.

### 5.3 Correspondence to Event Hoppers in Rich ERE

For event coreference, we directly inherited Rich ERE’s concept of event hoppers. [3] A hopper is a group of annotated events that refer to the same event occurrence. This differs from strict event coreference in ACE and Light ERE in which arguments also have to corefer strictly.

Quoting [3]:

Tagged event mentions that refer to the same event occurrence will be grouped into Event Hoppers. Event Hopper is a more inclusive, less strict notion of event coreference as compared to strict event coreference in ACE and Light ERE. Event hoppers contain mentions of events that feel coreferential to the annotator even if they do not meet the earlier strict event identity requirement. More specifically, event mentions that have the following features go into the same hopper:

Rich ERE event hopper criteria can be summarized as follows:

- They have the same event type and subtype.
- They have the same temporal and location scope, though not necessarily the same temporal expression or specifically the same date (Attack in Baghdad on Thursday vs. Bombing in the Green Zone last week).
- Trigger granularity can be different (assaulting 32 people vs. wielded a knife).
- Event arguments may be non-coreferential or conflicting (18 killed vs. dozens killed).
- Realis status may be different (will travel [OTHER] to Europe next week vs. is on a 5-day trip [ACTUAL])

# 6. Event Typology

## 6.0 Typographical convention

### EventType\_Subtype

<p>A description of the event type or subtype. Types are required but selecting subtypes is optional: do not select a subtype when it is a bad fit for the event being described. Absence of a subtype on an annotated event denotes an "Other" subtype.</p>	<p><i>Event mention example sentence with the trigger word in <b>bold</b>.</i></p>
<p><b>ParticipantArgument</b> Description of the Participant argument. <u>Taggability</u>: Rules on the taggability and extent of the participant is given as needed. As a general rule, the participant extent is a full Noun Phrase.</p>	<p><i>Participant argument example sentence with the argument <u>highlighted</u></i></p>
<p><b>FILLERARGUMENT</b> Brief description of the type-specific FILLER argument. For the full description for FILLER arguments and their taggability see 6.2. CAPITAL, TIME and PLACE are universal FILLERS allowed on all event types and are not included in event type overviews.</p>	<p><i>FILLER argument example sentence with the FILLER argument <u>highlighted</u>.</i></p>

- **Overlap** with a different **Type**: Sometimes there is conceptual overlap for an event with a different event that is likely to cause confusion when annotating. Here we resolve such conceptual overlap and make explicit the difference between types.
- **Keywords**: Here we provide keywords that are often associated with a type.
- **"Concept"**: [an.exampleoftype.url](#) Additionally, we provide URLs to webpages with further explanations and examples of the event concept.

## 6.1 Event types

### 1 CSR/Brand

#### CSR/Brand

<p>Corporate Social Responsibility (CSR) and Branding events take place when the company's effects on environmental and social well-being are assessed or when the brand image is affected. CSR involves ethical, ecological, environmental and social efforts (e.g. affirmative action, employee well-being, obtaining certifications) and on scandals violating responsibility such as sexism accusations, corruption, bribing, etc. Branding and marketing involves events improving or damaging image and credibility of the brand image, company image, or product image. This includes marketing, advertising campaigns, awards, affiliations, and sponsorships. Includes announcements, reports, quotations, and speculation on CSR and branding events.</p>			<i>example</i>
Company	The company or brand directly associated with the CSR, branding, or marketing event.	<i>Argument 1 example sentence with the argument highlighted</i>	

- **Overlap with Employment:** CSR/Brand is similar when social responsibility issues such as scandals or mistreatment of workers are discussed. The difference lies in the framing of the event: if a specific hiring or employee issue is discussed with the contextual focus on the problem itself we tag **Employment\_Problem**, if it is reported on in light of the impact on the brand or as a scandal we tag **CSR/Brand**.
- **Overlap with Product/Service:** CSR/Brand is tagged when an issue with a product or service is explicitly framed as affecting the brand or social responsibility of a company. If there is no explicit reference to the brand impact, **Product/Service** is tagged.
- **Overlap with Legal:** A scandal or social and environmental violations are often reference a legal framework or proceedings/outcomes. When to focus lies on the legality of the event we tag **Legal**. When the event is framed affecting the image or social/environmental responsibility we tag **CSR/Brand**.
- **Keywords:** ecological efforts, ethical and social efforts, scandal, corruption, social responsibility, environmental responsibility, marketing strategies and efforts, company image, brand image, product image, credibility, award, sponsorship, advertising campaign, affiliation.
- [https://en.wikipedia.org/wiki/Corporate\\_social\\_responsibility](https://en.wikipedia.org/wiki/Corporate_social_responsibility)
- <https://investopedia.com/terms/c/corp-social-responsibility.asp>
- [https://en.wikipedia.org/wiki/Brand\\_management](https://en.wikipedia.org/wiki/Brand_management)

## 2 Deal

### Deal

Deals and partnerships to cooperate with another company or entity. Two or more companies, organization or entities agree to jointly reach a goal. Examples of deals include service and product deals, licensing, contract bid, alliance, partnership, Memorandum of Understanding (MOU), pacts, joint ventures (two companies pool resources to accomplish a task), collaborations, contracts, agreements, development partnerships (usually public private partnerships for development projects), and affiliations. Includes announcements, reports, quotations, and speculation on deal events.		<i>example</i>
Partner	One of the partner in the deal. Taggability: A deal by definition has multiple partners so at least two or more Partner participants need to be tagged (if there is no violation of Event Mention Scope).	<i>Argument 1 example sentence with the argument highlighted</i>
Goal	Goal and aims of the deal. Taggability: Only annotate non-sentential units as the annotation extent, full sentences are not taggable.	

- **Overlap with Investment:** Deal is a more general type than investment: in an **Investment** event one party invest an amount of capital in a second party expecting a return on investment. A deal does not have to involve an expectation of a return nor an amount of capital and is more general.
- **Overlap with Merger/Acquisition:** Mergers and acquisition are large deals in which one company acquires ownership of another company. **Merger/Acquisition** are more specific then the general **Deal**, they require a targeted takeover of the full company or specific departments/assets of a company by an acquiring company.
- **Overlap with Employment:** In rare cases, a cooperation or agreement on hiring a company for a task is discussed. When the two parties concerned are companies, organization or governments, we tag a **Deal** event. When on of the parties is uni-vocally described in their function as an employ or job position a **Employment** event is annotated.
- **Overlap with Facility:** When two organization, companies or entities close a deal for the use of real-estate (such a lease), we tag **Deal**. When the event as framed as an opening or closing of a specific facility or describes any other issue with a specific facility, we tag **Facility**.
- **Keywords:** service and product deals, licensing, contract bid, alliance, partnership, Memorandum of Understanding (MOU), pacts, joint ventures (two companies pool resources to accomplish a task), collaborations, contracts, agreements, development partnerships (usually public private partnerships for development projects), and affiliations.

### 3 Dividend

#### Dividend

A dividend is a distribution of a portion of a company's earnings, decided by the board of directors, paid to a class of its shareholders. We also include other types of capital returns in this type such as share buybacks and ROC. Dividends can be issued as cash payments, as shares of stock, or other property. A dividend is a payment made by a corporation to its shareholders, usually as a distribution of profits. When a corporation earns a profit or surplus, the corporation is able to re-invest the profit in the business (called retained earnings) and pay a proportion of the profit as a dividend to shareholders. Distribution to shareholders may be in cash (usually a deposit into a bank account). Investors often view the company's dividend by its dividend yield which measures the dividend in terms of a percent of the current market price. The dividend rate can also be quoted in terms of the dollar amount each share receives (dividends per share, or DPS). Includes forecasts, reports, announcements, quotations and speculation on dividends and capital returns.

*example*

Company	The company giving out dividends.	<i>Argument 1 example sentence with the argument highlighted</i>
Amount	The total amount of dividends paid-out in monetary amount or as count of dividends.	<i>Argument 2 example sentence with the argument highlighted</i>
YieldRatio	The current dividend yield ratio in percentage.	

- **Overlap with SecurityValue:** Securities (i.e., stocks, options or bonds) and dividends can be broadly categorized as assets. However, a dividend is only an asset from a shareholder point-of-view. For companies on the other hand, dividends are a temporary liability. Due to this difference it is always clear whether dividends or securities are being discussed. For a more in depth discussion cf. <https://www.investopedia.com/ask/answers/091115/are-dividends-considered-asset.asp>.
- Keywords: dividend yield, yield ratio, pay-out, retained earnings, stable dividend policy, dividend reinvestment, cash dividend, stock or scrip dividend, stock dividend distribution, target pay-out ration, constant pay-out ratio.
- "Dividend": <https://www.investopedia.com/terms/d/dividend.asp>
- "Dividend": <https://en.wikipedia.org/wiki/Dividend>
- "Types of dividend": <https://www.accountingtools.com/articles/2017/5/16/types-of-dividends>
- "Types of dividend": <https://businessjargons.com/types-of-dividend.html>



## Dividend\_Payment

<p>A dividend is a payment made by a corporation to its shareholders, usually as a distribution of profits. When a corporation earns a profit or surplus, the corporation is able to re-invest the profit in the business (called retained earnings) and pay a proportion of the profit as a dividend to shareholders. Distribution to shareholders may be in cash (usually a deposit into a bank account).</p>			<i>example</i>
Company	The company giving out dividends.	<i>Argument 1 example sentence with the argument highlighted</i>	
Amount	The total amount of dividends paid-out in monetary amount or as count of dividends.	<i>Argument 2 example sentence with the argument highlighted</i>	
YieldRatio	The current dividend yield ratio in percentage.		

## Dividend\_YieldRaise

<p>The dividend yield ratio has increased over a period and has changed substantially as a positive percentage increase compared to a historical trend. The dividend yield is a financial ratio that indicates how much a company pays out in dividends each year relative to its share price. Dividend yield is represented as a percentage and can be calculated by dividing the dollar value of dividends paid in a given year per share of stock held by the dollar value of one share of stock.</p>			<i>example</i>
Company	The company giving out dividends.	<i>Argument 1 example sentence with the argument highlighted</i>	
Amount	The total amount of dividends paid-out in monetary amount or as count of dividends.	<i>Argument 2 example sentence with the argument highlighted</i>	
YieldRatio	The current dividend yield ratio in percentage.		
HistoricalYieldRatio	The dividend yield ratio in percentage compared to which the current yield ratio has increased.		

## Dividend\_YieldReduction

<p>The dividend yield ratio has decreased over a period and has changed substantially as a negative percentage decrease compared to a historical trend. The dividend yield is a financial ratio that indicates how much a company pays out in dividends each year relative to its share price. Dividend yield is represented as a percentage and can be calculated by dividing the dollar value of dividends paid in a given year per share of stock held by the dollar value of one share of stock.</p>			<i>example</i>
Company	The company giving out dividends.	<i>Argument 1 example sentence with the argument highlighted</i>	
Amount	The total amount of dividends paid-out in monetary amount or as count of dividends.	<i>Argument 2 example sentence with the argument highlighted</i>	
YieldRatio	The current dividend yield ratio in percentage.		
HistoricalYieldRatio	The dividend yield ratio in percentage compared to which the current yield ratio has decreased.		

## Dividend\_YieldStable

The dividend yield ratio has remained stable over a period and has not changed substantially compared to a historical trend. The dividend yield is a financial ratio that indicates how much a company pays out in dividends each year relative to its share price. Dividend yield is represented as a percentage and can be calculated by dividing the dollar value of dividends paid in a given year per share of stock held by the dollar value of one share of stock.		<i>example</i>
Company	The company giving out dividends.	<i>Argument 1 example sentence with the argument highlighted</i>
Amount	The total amount of dividends paid-out in monetary amount or as count of dividends.	<i>Argument 2 example sentence with the argument highlighted</i>
YieldRatio	The current dividend yield ratio in percentage.	
HistoricalYieldRatio	The dividend yield ratio in percentage compared to which the current yield ratio has remained stable.	

## 4 Employment

### Employment

Events regarding employment changes (firing and hiring), compensation, and issues regarding the workforce or other employees such as executives. Examples of this type are CEO changes, executive change, board change, executive compensation, employment issues, strikes, workforce increase, workforce decrease/firing. Includes announcements, reports, quotations, and speculation on employment events.		<i>example</i>
Employee	Employee, group of employees, part of the workforce.	<i>Argument 2 example sentence with the argument highlighted</i>
Employer	Employer company or employing person.	<i>Argument example sentence with the argument highlighted</i>
TITLE	The job title/position of the employee.	<i>FILLER example sentence with the argument highlighted</i>

- **Overlap** with CSR/Brand: [See CSR/Brand.](#)

- **Overlap** with Deal: [see Deal](#).

## Employment\_\_Start

A person or group of people start a new job position at an employer (company or organization). Includes events, announcements, speculation, expectation, changes on hiring, CEO changes, executive change, board change, workforce increases.			<i>example</i>
Employee	Employee, group of employees, part of the workforce starting a new position.	<i>Argument 2 example sentence with the argument highlighted</i>	
Employer	Employer company or employing person.	<i>Argument example sentence with the argument highlighted</i>	
Replacing	The person that the starting Employee replaces.	<i>Argument example sentence with the argument highlighted</i>	
TITLE	The job title/position of the starting Employee.	<i>Argument example sentence with the argument highlighted</i>	

## Employment\_\_End

The job position of a person or a group of people has ended with an employer (company or organization). Includes events, announcements, speculation, expectation, changes CEO change, executive change, board change, workforce decrease/firing, termination, death, illness, and any other form of ending a professional position.			<i>example</i>
Employee	Employee, group of employees, part of the workforce being terminated/fired.	<i>Argument 2 example sentence with the argument highlighted</i>	
Employer	Employer company or employing person doing the firing.	<i>Argument example sentence with the argument highlighted</i>	
Replacer	The person that replaces the terminated Employee.	<i>Argument example sentence with the argument highlighted</i>	
TITLE	The job title/position of the terminated Employee.	<i>Argument example sentence with the argument highlighted</i>	

## Employment\_Compensation

Changes in compensation for employees. Executive compensation as equity, workforce pay-out, payment issues, or wage in/decreases.		<i>example</i>
Employee	Employee, group of employees, part of the workforce who's compensation is affected.	<i>Argument 2 example sentence with the argument highlighted</i>
Employer	Employer company or employing person.	<i>Argument example sentence with the argument highlighted</i>
Amount	the monetary amount of compensation.	
TITLE	The job title/position of the terminated Employee.	<i>Argument example sentence with the argument highlighted</i>

## 5 Expense

### Expense

An expense is the cost that a business requires to operate on the short-term and long-term. An operating expense (OPEX) is a recurring expense a company incurs through its operations. Often abbreviated as OPEX, operating expenses include rent, equipment, inventory costs, marketing, payroll, insurance, and funds allocated for research and development. Revenue and capital expenses (CAPEX) are costs a company makes to maintain or upgrade existing assets made over a period of time. Includes announcements, reports, quotations, and speculation on operating, revenue and capital expenses.		<i>example</i>
Company	Company making the expense.	<i>Argument 2 example sentence with the argument highlighted</i>
Amount	The capital cost of the expense expressed as a monetary value.	<i>Argument 2 example sentence with the argument highlighted</i>

- **Overlap with Revenue:** Revenue is money a company earns from conducting business. Expenses are the costs you incur to generate that revenue. The ingredients you buy to make the ice cream, the wages you pay your employees, the rent and utilities you pay for your stand – these are all expenses. To remain viable, a company's revenue must exceed its expenses. Revenue is often referred to as the "top line" because it sits at the top of the income statement.
- **Overlap with Profit/Loss:** Profit/Loss captures total earnings or net income (AKA "the bottom line"). It consists of the gross revenue minus all expenses. A reduction in expenses can lead to increased earnings.

- **Overlap with SalesVolume:** SalesVolume events capture changes in the amount of product/service sales or consumers/subscriptions. The volume of sales impacts revenue and expenses. Variable operating expenses (such as delivery costs) closely associated with, and varying in close proportion to, changes in the total sales volume. Although not listed separately in income statement, these expenses are an important item of management accounts.
- **Overlap with Investment:** Expenses and Investments both incur costs to a business. An investment is an expense for which the primary purpose is to change the future revenue or cost structure of the enterprise. An investment involves an expected future return, while an expense is a cost to cover current operations, production, etc.
- **Overlap with Revenue:** A business can incur expenses that relate to acquiring revenue in the short-term, i.e. "revenue expenses". Revenue expenses will be tagged under the **Expense** type which is typically associated with capital expenses. The difference between revenue expenses and capital expenses is that revenue expenses are one-time costs instead of gradual over-time capital expense. These involve fixed one-time costs related to real estate, factory equipment, computers, office furniture, and other physical capital asset or intangible assets such as intellectual property, copyrights, patents, trademarks, et. al. Whenever a revenue expense is discussed we tag **Expense**.
- Keywords: operating expense, capital cost, cost saving, revenue expenditure.
- **OPEX vs. CAPEX:** We include both revenue types in **Revenue**. What follows is an explanation of the difference for clarification: Capital expenditure should not be confused with revenue expenditure or operating expenses (OPEX). Revenue expenses are shorter-term expenses required to meet the ongoing operational costs of running a business, and therefore they are essentially identical to operating expenses. Unlike capital expenditures, revenue expenses can be fully tax-deducted in the same year in which the expenses occur. (cf. <https://www.investopedia.com/terms/c/capitalexpenditure.asp>) While these types of expense are different in accounting because of US taxation and legal reasons, we combine them under one event as they capture the cost of operating a company.
- "Operating expense": [https://www.investopedia.com/terms/o/operating\\_expense.asp](https://www.investopedia.com/terms/o/operating_expense.asp)
- "Capital expenditure": <https://www.investopedia.com/terms/c/capitalexpenditure.asp>
- "Revenue expenditure": <https://www.accountingtools.com/articles/the-difference-between-capital-expenditures-and-revenue-expe.html>

## Expense\_Increase

Expenses and costs have increased compared to a historical trend. The company is expending more costs than before as a trend or on specific tangible (real-estate, rent, infrastructure) or intangible assets (intellectual property) assets.		<i>example</i>
Company	Company making the expense.	<i>Argument 2 example sentence with the argument highlighted</i>
Amount	The current capital cost of the expense expressed as a monetary value.	<i>Argument 2 example sentence with the argument highlighted</i>
HistoricalAmount	The historical capital cost compared to which the current amount is increased.	

## Expense\_Decrease

Expenses and costs have decreased compared to a historical trend. The company is expending less costs than before as a trend or on specific tangible (real-estate, rent, infrastructure) or intangible assets (intellectual property) assets. The company makes efficiency efforts in production or its operation saving capital.			<i>example</i>
Company	Company making the expense.	<i>Argument 2 example sentence with the argument highlighted</i>	
Amount	The current capital cost of the expense expressed as a monetary value.	<i>Argument 2 example sentence with the argument highlighted</i>	
HistoricalAmount	The historical capital cost compared to which the current amount is decreased.		

## Expense\_Stable

Expenses and costs remain stable or have not changed significantly compared to a historical trend. The company is expending less costs than before as a trend or on specific tangible (real-estate, rent, infrastructure) or intangible assets (intellectual property) assets. The company makes efficiency efforts in production or its operation saving capital.			<i>example</i>
Company	Company making the expense.	<i>Argument 2 example sentence with the argument highlighted</i>	
Amount	The current capital cost of the expense expressed as a monetary value.	<i>Argument 2 example sentence with the argument highlighted</i>	
HistoricalAmount	The historical capital cost compared to which the current amount has remained stable.		

## 6 Facility

### Facility

Events pertaining to a company's physical presence as facilities, factories, headquarters, warehouses, and other real-estate. Facilities opening, facilities closing, headquarters relocation, headquarters opening, headquarters closing. Facilities include headquarters, retail sites, production sites, logic centers, etc.		<i>example</i>
Facility	Facility, factory or headquarters.	<i>Argument 2 example sentence with the argument highlighted</i>
Company	Company that is owner of the facility or headquarters.	<i>Argument 1 example sentence with the argument highlighted</i>

- **Overlap with Investment:** We tag **Investment** when a company allocates capital for the development of a facility. **Facility** types are reserved for an existing, opening or planned product or service or for any other issue related to facilities.
- **Overlap with Deal:** [See Deal](#).
- Keywords: production site, facility, factory, headquarters,

### Facility\_Open

Facilities opening, includes headquarters, factories, production sites, retail sites, etc.		<i>example</i>
Facility	Facility or headquarters	<i>Argument 2 example sentence with the argument highlighted</i>
Company	Company opening facility or headquarters.	<i>Argument 1 example sentence with the argument highlighted</i>

### Facility\_Close

Facilities closing, includes headquarters, factories, production sites, retail sites, etc.		<i>example</i>
Facility	Facility or headquarters	<i>Argument 2 example sentence with the argument highlighted</i>
Company	Company opening facility or headquarters.	<i>Argument 1 example sentence with the argument highlighted</i>



## 7 Financial Report

### FinancialReport

<p>Financial results as discussed in reports published by the company or other instance (such as an rating firm, analyst, or fund). Quarterly and annual reports include key accounting and financial data for a company, including gross revenue, net profit, operational expenses and cash flow. We include all statements about cash flow that involves the incoming and outgoing transactions of a company (e.g., free cash flow (FCF)) and metrics derived thereof under this type. A quarterly report for a public company typically includes an income statement, balance sheet, and cash flow statement for the quarter and the year-to-date (YTD), as well as comparative results for the prior year. This event captures publishing, announcement or discussions of these reports and reported results within them.</p>		<i>example</i>
Reportee	Company that is the topic of the financial report.	
Result	The type of result with associated monetary amount that is reported on.	

- **Overlap with Financing, Investment, Profit/Loss, Revenue, SalesVolume:** Business journalism often relies on the financial reporting of a company. Financial statements involve the accounting concepts that are captured by the above types. When a specific result belonging to the above categories is contained in these reports, we tag the more specific event types. We tag **FinancialReport** when i) general financial result trends about the company are assessed or ii) a specific report (10-k, quarterly report, etc.) itself is evaluated.

### FinancialReport\_Beat

<p>A financial report shows that a company's financials are better than previous expectations or historical trends.</p>		<i>example</i>
Reportee	Company that is the topic of the financial report.	
Result	The type of result with associated monetary amount that is reported on.	

## FinancialReport\_Miss

A financial report shows that a company's financials are worse than previous expectations or historical trends. <i>example</i>	
Reportee	Company that is the topic of the financial report.
Result	The type of result with associated monetary amount that is reported on.

## FinancialReport\_Stable

A financial report shows that a company's financials are stable or as expected w.r.t. previous expectations or historical trends. <i>example</i>	
Reportee	Company that is the topic of the financial report.
Result	The type of result with associated monetary amount that is reported on.

## 8 Financing

### Financing

Financing of a company are ways in which it raises capital through debt and equity. Equity financing involves not just the sale of stocks, but also the sale of other equity or quasi-equity instruments such as preferred stock, convertible preferred stock and equity units that include common shares and warrants. These events focus on how a company raises equity through issuing shares in IPOs, stock splits, etc. Debt Financing refers to the way in which companies raise funds by taking on debt by issuing bonds or taking on loans. Debt financing occurs when a firm sells fixed income products, such as bonds, bills, or notes, to investors. The balance between equity and debt of a company is expressed as the weighted average cost of capital (WACC). Event mentions pertaining to company debt and debt ratios. Includes debt announcements, debt forecasts, debt increases, debt reductions, and debt and equity restructuring.

*example*

Finanee	The company selling equity as shares or taking on debt by issuing bonds or taking out loans.
Financer	The company, institution, or private entity investing in equity or giving out the loan.
Amount	Amount of capital financed as debt or equity.

- **Overlap** with `Ratings_Credit/Debt`: The difference with `Ratings_Credit/Debt` is not a debt or credit rating by an analyst. Debt Financing focuses on the means of gathering capital through taking on debt while a rating is a judgment made by an analyst on the companies overall debt (or capacity to repay debt).
- **Overlap** with `Investment`: The difference between `Investment` and `Financing` is that `Financing` events are focused around means of raising capital and not the investor-investee relation and the expectation of a future return. `Financing` events are focused around a company taking on debt to raise capital.
- <https://www.investopedia.com/terms/d/debtfinancing.asp>
- <https://www.investopedia.com/terms/e/equityfinancing.asp>
- <https://www.investopedia.com/ask/answers/032515/how-does-company-choose-between-debt-and-equity-its-capital-structure.asp>
- <https://www.investopedia.com/financial-edge/1112/small-business-financing-debt-or-equity.aspx>

- <https://finance.zacks.com/differences-between-debt-equity-investments-3035.html>
- <https://corporatefinanceinstitute.com/resources/knowledge/finance/debt-vs-equity/>
- <https://www.investopedia.com/terms/b/bond.asp>

## 9 Investment

### Investment

Investment takes place when an organization, company or entity allocates capital or time in expectation for some benefit/return in the future. We include corporate investment in other companies or subsidiaries as well as investments a company makes in infrastructure or products/services. Corporate capital investment involves one company investing in another company it owns as a subsidiary or does not control or own fully as in affiliate/associate companies. Corporate investments are often Capital Investments as part of a Corporate Finance strategy to strengthen the companies' portfolio.		<i>example</i>
Investor	Company or organization that makes the investment.	
Investee	Company being in which the Investor invests. Can also be a stock or other security.	
Return	The expected return or future benefit of the investment.	
CapitalInvested	Amount of capital invested as a monetary expression.	

- **Overlap with Merger/Acquisition:** The difference between Merger/Acquisition and Investment is that in the Merger/Acquisition event one company gains full ownership of another company or parts of that company. This is not the case in Investment where partial ownership through share investment is possible but not the goal.
- **Overlap with Deal:** [See Deal](#).
- **Overlap with Product/Service:** We tag Investment when a company allocates capital for the development of a future product or service. Product/Service types are reserved for an existing, trialed or planned product or service or for any other issue directly related to products or services.
- **Overlap with Facility:** [See Facility](#).
- **Overlap with Financing:** [See Financing](#).
- **Overlap with Expense:** [See Expense](#).
- General term "Investment": <https://en.wikipedia.org/wiki/Investment>
- "Capital investment": <https://www.investopedia.com/terms/c/capital-investment.asp>
- "Capital Investment": <https://www.investopedia.com/terms/c/corporatefinance.asp>

## 10 Legal

### Legal

Events pertaining to governmental justice. Investigations. accusations, litigations, arrest charges, Fraud, Money Laundering, Bribing, Settlement, Judgement, Lawsuit, Legal issues, Regulatory issues, injunctions.		<i>example</i>
Defendant	Entity, company, or person being alleged of a crime, under investigation, convicted, fined, etc.	
ALLEGATION	Allegation or other formal/legal offence that is alleged against a Defendant.	

- **Overlap** with CSR/Brand: [See CSR/Brand.](#)

### Legal\_Proceeding

A court proceeding has been initiated for a defendant accused of an allegation. Legal proceedings include trials, lawsuits, and hearings. Trials are state-initiated proceedings in a court. Hearing are state-initiated proceedings outside the court (e.g. in Senate). Lawsuits are proceedings between private parties. This also includes charges and indictments, i.e. formal accusations, and investigations.		<i>example</i>
Defendant	Entity being convicted, fined, etc.	
Complainant	Entity filing suit or initiating the proceeding by accusation of the defendant. Governmental prosecutor, plaintiff, litigator, suer, petitioner.	
Adjudicator	Judge or court. In case of investigation, the investigator either private by attorney or public police investigators.	
ALLEGATION	Allegation or other formal/legal offence that is alleged against a Defendant.	

## Legal\_Conviction/Settlement

A defendant has been found guilty of an allegation and is at the conclusion of a trial. The defendant is convicted to a sentence which can be jail-time, a fine, cease-and-desist, etc. Also applies where allegations are settled out of court.		<i>example</i>
Defendant	Entity being convicted, fined, etc.	
Adjudicator	Entity proclaiming the conviction.	
SENTENCE	Sentence, fine, incarceration, or other punishment.	
ALLEGATION	Allegation or other formal/legal offence that is alleged against a Defendant.	

## Legal\_Acquit

A defendant has been found not guilty of an allegation at the conclusion of a trial. This is the opposite of conviction.		<i>example</i>
Defendant	Entity being convicted, fined, etc.	
Adjudicator	Entity proclaiming the acquittal.	
ALLEGATION	Allegation or other formal/legal offence that is alleged against a Defendant.	

## Legal\_Appeal

A court decision is taken to a higher court for review.		<i>example</i>
Defendant	Entity being convicted, fined, etc.	
Complainant	Entity filing suit or initiating the proceeding by accusation of the defendant. Governmental prosecutor, plaintiff, litigator, sue-er, petitioner.	
Adjudicator	Entity proclaiming the appeal.	
ALLEGATION	Allegation or other formal/legal offence that is alleged against a Defendant.	

## 11 Macroeconomics

### Macroeconomics

Macro-economic events are aggregated indicators such as sectorial trends, policy, GDP, unemployment rates, national income, price indices, and the interrelations among the different markets and sectors of the economy. Includes events, speculation, expectation, forecasts, announcements, changes on a company's position in the market, the state of the market, sector or country in general, headwinds, tailwinds, business trends, market share, consumer spending, etc. We include discussions on a company's position in the market (e.g. compared to competitors).		<i>example</i>
AffectedCompany	Company, organization, or entity being affected by the macroeconomic event.	
Sector	Sector, industry, market, state, geographical location where the event takes effect.	

## 12 Merger/Acquisition

### Merger/Acquisition

Consolidation of companies and assets involving at least two companies. A merger is a legal consolidation of two entities into one entity. An acquisition occurs when one entity takes ownership of another entity's stock, equity interests or assets.		<i>example</i>
Acquirer	Entity receiving the company or assets	
Target	Entity filing suit or initiating the proceeding by accusation of the defendant. Governmental prosecutor, plaintiff, litigator, suer, petitioner.	
Cost	Cost of the merger or acquisition in monetary amount.	

- **Overlap** with Deal: [see Deal](#).
- **Overlap** with Investment: The difference between **MergerAcquisition** and **Investment** is that in the **MergerAcquisition** event one company gains full ownership of another company or parts of that company. This is not the case in **Investment** where partial ownership through share investment is possible but not the goal.

- "Mergers and Acquisitions": <https://www.investopedia.com/university/mergers/mergers1.asp>
- "Mergers and Acquisitions": [https://en.wikipedia.org/wiki/Mergers\\_and\\_acquisitions](https://en.wikipedia.org/wiki/Mergers_and_acquisitions)

## 13 Product/Service

### Product/Service

Events pertaining to a specific product or service. <i>example</i> Includes announcements, launches, testing, changes, up/downgrades, updates, recalls, trial results, approvals, reviews, and other issues regarding products and services of a company. NOTE: General mentions of a product or service as belonging to a company are not tagged: the product has to be involved in a concrete event or issue.	
ProductService	The Product/Service in question.
Producer	Company, organization, or entity that produces, delivers, or otherwise brings to market the product or service.

- **Overlap with Investment:** [See Investment.](#)
- **Overlap with CSR/Brand:** [See CSR/Brand.](#)
- **Keywords:** Launch, recall, cancellation, production pipeline, goods, trial, acceptance.

### Product/Service\_Launch

A company brings a new product/service to market. <i>example</i> Also applicable to product and service updates.	
ProductService	Product/Service being launched.
Producer	Company, organization, or entity that launches (or updates) a new product or service.

Product/Service\_Launch

### Product/Service\_Cancellation/Recall

A company recalls a product or cancels a product/service. <i>example</i>	
ProductService	Product/service being launched
Producer	Company, organization, or entity that recalls or cancels a product or service.



## Product/Service\_Trial

<p>A product or service is being tested or trialed either by a company or regulatory body. <i>example</i></p> <p>This includes testing runs of prototypes, and approval or disapproval after trial by regulatory agents or governments. This type is typical for reporting on biotechnology and pharmaceutical industries which require trial by a regulatory body. Technology and consumers products/services are also often trialed before being brought to market.</p>	
ProductService	Product/service being launched
Producer	Company, organization, or entity that is testing the product/service.
Trialer	Governmental or private regulator, organization, or other entity overseeing the trial.

## 14 Profit/Loss

### Profit/Loss

<p>Net income or earnings are the profits/losses realized by a business (commonly called "the bottom line"). Profits are financial benefits that are realized when the amount of revenue exceeds expenses and costs. Inversely, losses happen when the expense exceeds the revenue. Net income is the difference between revenue and the cost of making a product or providing a service, before deducting overheads, payroll, taxation, and interest payments. We also include operating profit (earnings before interest and taxes (EBIT)) and other metrics for assessing a company's profitability such as "earnings per share" (EPS). We include declarations and forecasts of profit/loss, positive and negative (losses) profit, lower than, higher than, as expected, increased, decreased, and stable profits. <i>example</i></p>	
Profiteer	Company, organization, or entity turning a profit or loss.
Amount	The amount of money won/lost.

- **Overlap with Expense:** [See Expense](#).
- **Overlap with Revenue:** **Profit/Loss** is what remains after expenses are deducted from revenue. Net income is calculated by taking revenues and subtracting the costs of doing business such as depreciation,

interest, taxes, and other expenses.

- Keywords: net income, net earnings, profit, loss, total comprehensive income, net earnings, net profit, bottom line, gross profit, gross margin, sales profit, credit sales, net profit margin percentage.

### Profit/Loss\_**Increase**

Profit or Loss has increased compared to a historical trend. We do not differentiate between Profit and Loss: this event applies to whichever is the topic of the event. <i>example</i>	
Profiteer	Company, organization, or entity turning a profit or loss.
Amount	The current amount of money won/lost.
HistoricalAmount	The historical amount of money won or lost compared to which the current amount is higher.

### Profit/Loss\_**Decrease**

Profit or Loss has decreased compared to a historical trend. This includes a nominal decrease as well as a slowing in earnings growth. We do not differentiate between Profit and Loss: this event applies to whichever is the topic of the event. <i>example</i>	
Overlap with <b>Revenue</b> .	
Profiteer	Company, organization, or entity turning a profit or loss.
Amount	The current amount of money won/lost.
HistoricalAmount	The historical amount of money won or lost compared to which the current amount is lower.

## Profit/Loss\_Stable

<p>Profit or Loss has remained stable or there is no significant change compared to a historical trend. We do not differentiate between Profit and Loss: this event applies to whichever is the topic of the event.</p> <p>Overlap with <b>Revenue</b>:</p>		<i>example</i>
Profiteer	Company, organization, or entity turning a profit or loss.	
Amount	The current amount of money won/lost.	
HistoricalAmount	The historical amount of money won or lost compared to which the current amount remained stable.	

## 15 Rating

### Rating

<p>Analyst ratings and advice on securities such as stocks but also credit and debt ratings. Includes announcements, forecasts, speculation, expectation, reports, etc. on analyst ratings, analyst advice, analysts setting Price targets, analysts credit-debt ratings, changes in rating agency listing, or buy/sell/hold and upgrade/downgrade/maintain advice.</p>		<i>example</i>
Security	Security or company's debt being rated.	
Analyst	Rater, advisor or analyst publishing the rating.	

- Overlap of subtype **Rating\_Credit/Debt** with **Financing**: [See Financing](#).
- <https://www.investopedia.com/financial-edge/0512/understanding-analyst-ratings.aspx>

## Rating\_BuyOutperform

Analyst advises to buy a security. "Outperform" signals an analyst recommendation a stock is expected to do slightly better than the market return. Buy and outperform can also be expressed as "overweight", "moderate buy", "accumulate", "add", "buy" and "strong buy" advice.		<i>example</i>
Security	Security being rated.	
Analyst	Rater, advisor or analyst publishing the rating.	

## Rating\_SellUnderperform

Analyst advises to sell a security or liquidate an asset. "Underperform" signals a recommendation that a stock is expected to do slightly worse than the overall stock market return. Sell or underperform can also be expressed as "moderate sell," "weak hold" and "underweight.". Includes "underweight", "underperform", "moderate sell", and "sell" and "strong sell" advice.		<i>example</i>
Security	Security being rated.	
Analyst	Rater, advisor or analyst publishing the rating.	

## Rating\_Hold

Analyst advises to hold a security. A hold recommendation signals a security is expected to perform at the same pace as comparable companies or in-line with the market. Includes "hold" and "neutral" advice.		<i>example</i>
Security	Security being rated.	
Analyst	Rater, advisor or analyst publishing the rating.	

## Rating\_Upgrade

Analyst ratings, credit rating or advice are upgraded from an (implied) previous rating. For stocks, a "hold" advice can be upgrade to a "buy" advice. A "sell" advice can be upgraded to a "hold" or "buy" advice. <i>example</i>	
Security	Security being rated.
Analyst	Rater, advisor or analyst publishing the rating.
HistoricalRating	The previous rating from which the security is upgraded.

## Rating\_Downgrade

Analyst ratings, credit rating or advice are upgraded from an (implied) previous rating. For stocks, a "buy" advice can be downgraded to a "hold" or a "sell" advice. A "hold" advice can be downgraded to a "sell" advice. <i>example</i>	
Security	Security being rated.
Analyst	Rater, advisor or analyst publishing out the rating.
HistoricalRating	The previous rating from which the security is downgraded.

## Rating\_Maintain

Analyst security ratings, credit rating or advice remain in the same category from an (implied) previous rating. <i>example</i>	
Security	Security being rated.
Analyst	Rater, advisor or analyst publishing the rating.
HistoricalRating	The previous rating from which the security remains stable.

## Rating\_PriceTarget

Analyst projects a price target for a security. A price target is the projected price level of a financial security stated by an investment analyst or advisor and includes assumptions of future activity. It represents a security's price that, if achieved, results in a trader recognizing the best possible outcome for his investment. This is the price at which the trader or investor wants to exit his existing position so he can realize the most reward. *example*

Security	Security being rated.
Analyst	Rater, advisor or analyst publishing the rating.
TargetPrice	The target price or value of a security as a range or singular price expressed as monetary value.

## Rating\_Credit/Debt

Analyst credit or debt rating for a company or organization. A corporate credit rating is an opinion of an independent agency regarding the likelihood that a corporation will fully meet its financial obligations as they come due. A companys corporate credit rating indicates its relative ability to pay its creditors and gives investors an idea of how the companys debt securities should be priced in term of yields. Credit assessment and evaluation for companies and governments is generally done by a credit rating agency such as Standard & Poors (S&P), Moodys, or Fitch. *example*

Security	Security being rated.
Analyst	Rater, advisor or analyst publishing the rating.

- <https://www.investopedia.com/terms/c/corporate-credit-rating.asp>
- <https://www.investopedia.com/terms/c/creditrating.asp>
- [https://en.wikipedia.org/wiki/Bond\\_credit\\_rating](https://en.wikipedia.org/wiki/Bond_credit_rating)

## 16 Revenue

### Revenue

Revenue is the total amount of income generated its diverse range of activities before any expenses. Events regarding operating revenue is revenue generated from a company's primary business activities. Non-operating revenue is revenue generated by activities outside of a company's primary operations; this revenue tends to be infrequent and oftentimes unusual. We include both revenue types. Revenue refers to both gross and net revenue (i.e. the revenue after revenue expenses: the cost made to obtain revenue, (e.g., returns, delivery, etc.)).

*example*

Company	Company responsible for the revenue.
Amount	Amount of gross revenue expressed as monetary value.

- **Overlap** with Expense: [See Expense](#).
- **Overlap** with Profit/Loss: [See Profit/Loss](#).
- **Overlap** with SalesVolume: Sales are the proceeds from the selling of goods or services to its customers. In accounting terms, sales make up one component of a company's revenue. On an income statement, sales are usually referred to as gross sales or "the top line" since sales are often used interchangeably with revenue. If your revenues are increasing but your net profits are not, that is a sure sign your expenses are up. Sales is the leading indicator for most companies, so most companies track sales closely.
- <https://www.investopedia.com/terms/o/operating-revenue.asp>
- <https://en.wikipedia.org/wiki/Revenue>
  - <https://keydifferences.com/difference-between-sales-and-revenue.html>
  - <https://www.investopedia.com/ask/answers/122214/what-difference-between-revenue-and-sales.asp>

## Revenue\_Increase

Revenue has increased compared to a historical trend. <i>example</i> This includes a nominal increase as well as a acceleration in growth rate. Overlap with <b>SalesVolume</b> : Sales are a part of the revenue and are considered almost identical to operating revenue in some industries. However, if explicit mention of sales volume or amount is made a SalesVolume event should be tagged.	
Company	Company responsible for the revenue.
Amount	Current amount of gross revenue expressed as monetary value.
HistoricalAmount	The historical revenue amount compared to which the current amount is higher.
IncreaseAmount	Relative or nominal capital increase in revenue as monetary amount or percentage.

## Revenue\_Decrease

Revenue has decreased compared to a historical trend. <i>example</i> This includes a nominal decrease as well as a slowing in revenue growth rate.	
Company	Company responsible for the revenue.
Amount	Current amount of gross revenue expressed as monetary value.
HistoricalAmount	The historical revenue amount compared to which the current amount is lower.
DecreaseAmount	Relative or nominal capital decrease in revenue as monetary amount or percentage.



## Revenue\_Stable

Revenue figures or growth has remained stable or there is no significant change compared to a historical trend. <i>example</i>	
Company	Company responsible for the revenue.
Amount	Current amount of gross revenue expressed as monetary value.
HistoricalAmount	The historical revenue amount compared to which the current amount has remained stable.

## 17 Sales Volume

### SalesVolume

The quantity of goods and services sold over a certain period. This quantity can be expressed by a gross amount of money or units sold/customers served. We include changes, announcements, declarations and forecasts of sales volume figures, increased, decreased, stable. <i>example</i> Overlap with <b>Revenue</b> and <b>FinancialReport</b> .	
GoodsService	The product, goods or services that makes up the sales volume
Seller	The company, organization or entity selling the goods or services.
Buyer	The buyer, group of buyers, or target market to which the change in sales volume can be attributed.
Amount	Current amount of goods and services sold, expressed as monetary expression or as amount of units.

- **Overlap** with Expense: [See Expense](#).
- **Overlap** with Revenue: [See SalesVolume](#).
- <https://www.accountingtools.com/articles/what-is-sales-volume.html>

## SalesVolume\_Increase

The quantity of goods and services sold over a certain period. We include changes, announcements, declarations and forecasts of sales volume figures, increased, decreased, stable. <i>example</i>	
GoodsService	The product, goods or services that makes up the sales volume
Seller	The company, organization or entity selling the goods or services.
Buyer	The buyer, group of buyers, or target market to which the change in sales volume can be attributed.
Amount	Current amount of goods and services sold, expressed as monetary expression or as amount of units.
HistoricalAmount	The historical sales volume amount compared to which the current amount is higher.

## SalesVolume\_Decrease

The quantity of goods and services sold over a certain period. This includes a nominal decrease as well as a slowing in sales growth. We include changes, announcements, declarations and forecasts of decreasing sales volume figures and slowing sales volume growth. <i>example</i>	
Overlap with Revenue and FinancialReport.	
GoodsService	The product, goods or services that makes up the sales volume
Seller	The company, organization or entity selling the goods or services.
Buyer	The buyer, group of buyers, or target market to which the change in sales volume can be attributed.
Amount	Current amount of goods and services sold, expressed as monetary expression or as amount of units.
HistoricalAmount	The historical sales volume amount compared to which the current amount is lower.

## SalesVolume\_Stable

<p>The quantity of goods and services sold over a certain period. We include changes, announcements, declarations and forecasts of sales volume figures, increased, decreased, stable. Has conceptual overlap with Revenue and FinancialReport.</p>		<i>example</i>
GoodsService	The product, goods or services that makes up the sales volume.	
Seller	The company, organization or entity selling the goods or services.	
Buyer	The buyer, group of buyers, or target market to which the change in sales volume can be attributed.	
Amount	Current amount of goods and services sold expressed as monetary expression or as amount of units.	
HistoricalAmount	The historical sales volume amount compared to which the current amount is stable.	

## 18 Security Value

### SecurityValue

<p>Events describing the value/price or change in value/price of a share, stock, derivative or any tradable financial asset. We also includes groupings of securities as in Exchange Traded Funds of market indices (This includes when descriptions and growth/decline/stability in a market index is discussed). We include announcements, forecasts, speculation, expectation, reports, etc. on price increase/decrease/stability or plain value/price descriptions that do not compare to a historical trend.</p>		<i>example</i>
Security	The security in question.	
Price	The current price of a single security. Expressed as monetary value.	

- **Overlap with Dividend:** [See Dividend.](#)
- <https://www.investopedia.com/terms/s/security.asp>
- [https://en.wikipedia.org/wiki/Security\\_\(finance\)](https://en.wikipedia.org/wiki/Security_(finance))

## SecurityValue\_Increase

<p>Events describing an increase or positive percentage growth in value/price a share, stock, derivative or any tradable financial asset compared to a historical trend. We also includes groupings of securities as in Exchange Traded Funds of market indices (this includes when growth in a market index is discussed). Includes announcements, forecasts, speculation, expectation, reports, etc. on price increase.</p>		<i>example</i>
Security	The security in question.	
Price	The current price of a single security up to which the historical price increased. Expressed as monetary value.	
HistoricalPrice	The historical unit price of the security compared to which to current price is an increase. Expressed as monetary value.	
IncreaseAmount	Relative or nominal price increase as monetary amount or percentage.	

## SecurityValue\_Decrease

<p>Events describing a decrease or negative percentage decline in value/price a share, stock, derivative or any tradable financial asset compared to a historical trend. We also includes groupings of securities as in Exchange Traded Funds of market indices (This includes when decline in a market index is discussed). Includes announcements, forecasts, speculation, expectation, reports, etc. on price reduction.</p>		<i>example</i>
Security	The security in question.	
Price	The current price of a single security. Expressed as monetary value.	
HistoricalPrice	The historical unit price of the security compared to which to current price is a decrease. Expressed as monetary value.	
DecreaseAmount	Relative or nominal price decrease as monetary amount or percentage.	

## SecurityValue\_Stable

<p>Events describing stability or no significant percentage change in value/price a share, stock, derivative or any tradable financial asset compared to a historical trend. We also includes groupings of securities as in Exchange Traded Funds of market indices (This includes when decline in a market index is discussed). Includes announcements, forecasts, speculation, expectation, reports, etc. on price stability.</p>		<i>example</i>
Security	The security in question.	
Price	The current price of a single security up to which the historical price remained stable. Expressed as monetary value.	
HistoricalPrice	The historical unit price of the security compared to which to current price is stable. Expressed as monetary value.	

## 6.2 FILLER arguments

For information on when to annotate FILLER arguments, see [Section 4.4. FILLER Argument Taggability](#). For the event ontology, we describe conceptual and taggability properties of individual FILLER arguments here.

### 1 Universal FILLER Arguments: TIME, PLACE, CAPITAL

Universal FILLER arguments are applicable to all events regardless of type and subtype. Annotators should always be aware and looking for these FILLER arguments. These arguments are universal because they are highly probable to be associated with any economic event: An event is inherently temporal (**TIME**) and locational (**PLACE**): it occurs somewhere and takes up some point or duration in time. In economic news, events often carry a cost or involve an amount of money. For this, we introduce the **CAPITAL** FILLER argument.

#### TIME

**On types and subtypes:** all.

**Conceptually:** A TIME is a temporal expression that corresponds to a specific duration and point in time. This includes calendar dates (e.g., "October 29", "June 2017", "the 24th of April") but also relative time descriptions (e.g., "yesterday", "last week", "next year") and durations (e.g., "the coming months", "over five years").

**Taggability:**

The full nominal constituent NP of the duration of time point will be tagged. This includes pre- and post-modifiers and excludes the preposition that is the head of the TIME noun phrase.

- (56) *In [ 2017 ], the company announced their desire for entering the Chinese market.*
- (57) *The decision to replace the executive will be made [ next Thursday ].*
- (58) *The leaders met [ last week ] in Lagos.*
- (59) *They have been working on the deal for [ the better part of a year ].*
- (60) *The park will open [ Monday 23 June ].*
- (61) *The Boeing Corp. announced the deal [ yesterday after Trump's visit to Iran ].*

**PLACE**

**On types and subtypes:** all.

**Conceptually:**

PLACE encompasses specific mentions of geographic locations. It refers to places (e.g., "Wall Street", "The White House", "Downing Street"), cities (e.g., "Washington", "Detroit"), countries ("US", ""), states (e.g., "Oregon", "Kentucky"), regions (e.g., "Central-Asia", "the Champagne region", "the fourth district", "CBD" (Central Business District)), and markets expressed as geographic locations (e.g., "the Indian market"). We also include nicknames (e.g., "the Big Apple", "Motor City").

**Taggability:**

The full NP containing the location expression is tagged. This includes pre- and post-modifiers and not the preposition that is the head of the PLACE noun phrase.

Rich ERE does not tag location FILLER arguments. This information is particularly important for many economic events as business is legally bound by market and geography.)

**CAPITAL**

**On types and subtypes:** all.

**Conceptually:** Financial capital is any economic resource measured in terms of money used by entrepreneurs and businesses to buy what they need to make their products or to provide their services to the sector of the economy upon which their operation is based, i.e. retail, corporate, investment banking, etc.

A CAPITAL FILLER argument is the amount of money (or securities or commodities that hold transactional value) that is associated with an event. It is usually described in terms of the currency of some country or region (e.g., "US Dollars", "\$", "USD" or "Euros", "EUR"), but can also be expressed in an amount of securities, equity or debt (e.g., "1.5 million dollars in stock", "27,000 shares" or "3.7 million in Covered Bonds").

**CAPITAL vs. similar Participant arguments:** Many event types have a Participant argument such as Cost, Amount or Capital that is conceptually similar to this FILLER argument. However CAPITAL

has other taggability rules w.r.t. Event Mention Scope - being a FILLER argument: Unlike the similar Participant arguments, **CAPITAL** can be tagged from anywhere in the document preferring the closest mention. If a similar Participant argument is in Event Mention Scope tagging the argument *always* takes precedence over tagging that mention as FILLER **CAPITAL**. Furthermore, FILLER arguments are always nominal constituents and can never be pronominal unlike Participant arguments.

**Taggability:** The extent of money a **CAPITAL** mention encompasses the full NP in which the capital amount is mentioned. It needs to include modifying constituents as well as monetary units. This includes quantifying adjective phrases (e.g., "almost", "a large amount of", "almost") and qualifying adjectives (e.g., "large", "exuberant", "plentiful").

(62) *The company invested [ nearly 230 million dollars ] in the newly founded lab.*

(63) *Facebook faces fines of [ up to 11 billion Euros ] if they do not comply with GDPR.*

(64) *XYZ Corp. acquired [ 18000 shares ] in a 1:2 acquisition stock deal.*

(65) *The position involves [ a plentiful \$ 1,200,000 signing bonus ].*

Similar to Rich ERE MONEY (MON) arguments, but in taggability resembles the COMMODITY (COM) filler argument. (cf., DEFT Rich ERE Annotation Guidelines: Argument Fillers v2.3 p11)

## 2 Type-Specific FILLER Arguments

These FILLER arguments are only tagged when they belong to a specific **type** or **subtype**.

### SENTENCE

**On types and subtypes:** Legal.Conviction/Settlement.

#### Conceptually:

A conviction is formal declaration by the verdict of a jury or the decision of a judge in a court of law that someone is guilty of a criminal offence. A settlement is an official agreement intended to resolve a dispute or conflict. Both are the outcome of a formal allegation in which one party is forced to a penalty by the court or the litigating party.

#### Taggability:

The full NP containing the sentence is tagged including any determiners, articles, pre- and post-modifiers.

### ALLEGATION

**On types and subtypes:** any Legal type.

**Conceptually:** Allegation or other formal/legal offence that is alleged against a defendant. **ALLEGATION** is tagged whenever an crime, misconduct or other offense is formally alleged against a company, organization or person.

**Taggability:** The full NP containing the sentence is tagged including any determiners, articles, pre- and post-modifiers.

## TITLE

**On types and subtypes:** any `Employment` type.

**Conceptually:** The job title/position of the an Employee or a certain professional role, type of worker. Titles are the personal titles and honorifics, official rank or status, and specific employed occupations or professional positions. Annotators will need to use best judgment when determining whether a position or occupation is specific enough to be tagged as a title (e.g., general types such as worker, official, member, employee, will not be tagged TITLE).

### Taggability:

For our purposes, the extent of a TITLE is limited to the string of text that describes the position or rank itself, independent of its organizational circumstances or relationships, and excluding a preceding definite article (the) and any other pre-posed or post-posed modifiers.

Because TITLES occur in conjunction with other entities and refer to other entities, they have some special rules. The most frequent constructions TITLES occur in are title + name, appositives, and copula constructions.

Just as with appositives, all titles, positions, and honorifics will be marked separately from the individual's name.

## 6.3 Event Type Conceptualization Notes

### 1 Continuous vs. Categorical change

Many events in this typology express some form of change: either in rating, price, value, or some other observable result. Among these events we can distinguish changes that apply to continuous values and categorical values. A continuous event is a `SalesVolume` or `SecurityPrice` event. A real price value changes gradually over time and the event structure captures a snapshot of this change. A categorical change are `Financial Report` and `Rating change`. We expect the event trigger to inherently signal the change in value rather than a verb as a predicate taking arguments that signal the change.

For instance, `Rating_Buy` does not have a Participant argument `Rating` for its "buy" rating as the event type itself would be expressed by the mention of "buy". The would-be `Rating Participant` argument is necessary for making the subtype distinction and therefore co-opted by the trigger extent. This is unlike Continuous events which are more likely to be triggered by a verb that takes multiple semantic arguments: `SecurityValue_Increase` inherently involves a historical price trend and a current price as Participant argument. The process of increasing itself can easily be expressed by standalone verbs such as "increase", "grow", "go up".



# 7. Guidelines Enhancement Proposal

During annotation, correction, and adjudication, potential improvements for SENTiVENT Event Annotation Guidelines v1.0 became apparent. This proposal should ideally be incorporated in future application of the annotation scheme to better fulfill the goals of coverage, distinctiveness, and domain descriptability. We propose the following categories of changes and improvements: Typology annotation process improvements, etc.

Some issues include indications about how they can be automatically resolved by pre-processing the data for experimenting with the v1.0 dataset. These automated solutions sacrifice the descriptiveness of the annotation unit for more consistency and correctness.

NB: Some changes in the event descriptions were also made during annotation and correction. These changes were clarifications on difficult and ambiguous cases to help annotators. Annotators continually received updated copies of the typology. These are described in the version history and not in this section.

## 7.1 Typology Enhancements

Typology enhancements serve to improve coverage of the events that capture the financial news domain, as well as resolve ambiguity between categories and their descriptions. Each proposed enhancement is expressed Addition, Deletion, Separation, and Combination of Participants, Types or Subtypes. Addition is typically proposed because a new relevant Type, Subtype, Participant argument was prevalent in the corpus. Inversely, we consider Deletion when an annotation unit was considerably rare. We propose Combination of types when two categories are semantically too similar and separation does not aid descriptiveness. Inversely, we consider Separation when an annotation unit is too general and consequently ambiguous and non-descriptive.

- Addition of participant Source to Expense, Profit/Loss, Revenue, SalesVolume event types.
  - Description: The source of earnings, revenue, expenses, and sales is often mentioned, but unaccounted for in V1.0. Source participant: The source, good/service, subsidiary company, brand, etc. that generates the event.
  - Example:
  - Status: Not yet implemented.
- Addition of participant Indicator to Expense, Profit/Loss, Revenue, SalesVolume event types.
  - Description: Financial metrics/indicators are often not tagged consistently when they are related to an event. These indicators often contain event triggers (i.e., Revenue, Expense, Profit/Loss, SalesVolume). Especially the time expressions associated with the period for financial metrics/indicators should be annotated more consistently. These time expressions are often modifiers in the NP that expresses the indicator and is also an event trigger. The TIME filler does not fulfill this role because TIME constitutes a defined period or point in time related to the event. Often long dependencies arise with these expressions as they are used adverbially. We propose to add a universal Filler participant Indicator which captures the financial indicator/metric associated with an event. A disadvantage is the event trigger would often be part of this participant.

- Example: adjusted annual rate of (sales/revenue/etc.) [...] year-over-year, year-to-date, etc.
- Status: Not yet implemented.
- Addition of event subtype Pricing on Product/Service event.
  - Description: Pricing of Goods and Services is often discussed in articles. Discussion on the change or announcements of pricing of goods/services. Includes changes in pricing, discounts, incentives, etc. Participants: Company (company that prices the good or service), GoodService (The good or service which is priced), Price (reported or announced price as a monetary expression), and ChangeAmount (nominal or percentage change in pricing).
  - Example:
  - Status: Not yet implemented.
- Separation of Macroeconomics event type into MarketShare and Macroeconomics (potentially also Legislation or Trends):
  - Description: The Macroeconomics type was conceptualized as a category for events that are aggregated indicators for sectorial trends, policy, and the interrelations among the different markets and sectors of the economy. A large amount of Macroeconomic discuss the market share of a company in a market/sector and are distinct in event structure and relevancy to a company.
  - Example:
  - Status: Not yet implemented.
- Extent redefinition TIME Filler participant:
  - Description: TIME Filler participant extents should include the prepositions that define the temporal expression, instead of the NP with post- and pre-modifiers. The propositions of time "around, on, in, from ... to, etc." contain relevant temporal information that would be tagged by only annotating the NP.
  - Example:
  - Status: Not yet implemented.
- Addition of Increase/DecreaseAmount participant on all Increase/Decrease "indicator" event subtypes: Dividend\_YieldX, Expense, Profit/Loss, Revenue (already included in v1.0), and SecurityValue.
  - Description: As in Revenue main type, the Increase/Decrease/Stable(?) subtypes of indicator events, should specify a participant that captures the nominal or percentage change in the indicator value. This is currently named "Increase/Decrease" amount on the Revenue main type, but could be renamed to ChangeAmount. These types express a movement from some historical indicator value to another current value. This movement is often also discussed as a nominal or percentage amount. Amount on these event types should be renamed CurrentAmount for clarity. In v1.0, this number is included in the Amount participant for those event type that miss this participant.
  - Example:
  - Status: Not yet implemented.
  - Experimental pre-processing: Join the Revenue Increase/DecreaseAmount into Amount to be consistent with other types.

- Addition of Complainant participant on all Legal event types.
  - Description: The Complainant participant is missing on all Legal main and subtypes except for Legal\_Proceeding and Legal\_Appeal. This was an oversight and should be added for completing this event frame.
  - Example:
  - Status: Not yet implemented.
- Addition of CorporateGovernance event type.
  - Description: Discussion of corporate governance (board votes and make-up) is rare in reporting, but important to detect.
  - Example:
  - Status: Not yet implemented.
- Deletion of Result participant from FinancialResult. Alternatively: Rename Result to Metric/Indicator.
  - Description: Result is redundant and often includes a whole clause in annotations. Renaming to Metric/Indicator would better suit the originally intended role.
  - Example:
  - Status: Not yet implemented.
  - Experimental pre-processing: This can be achieved automatically by string substitution.
- Rename Profit/Loss to Earnings.
  - Description: Earnings is a more technical term that better describes this event type.
  - Example:
  - Status: Not yet implemented.
  - Experimental pre-processing: This can be achieved automatically by string substitution.

## 7.2 Common issues and difficulties

Here we describe issues, mistakes, and difficulties commonly encountered by annotators.

- Event trigger identification for subtypes.
  - Description: Annotators often forgo annotating the full trigger for identifying the event subtype. Often, annotators correctly annotate the trigger for the main event type, but fail to annotate additional tokens necessary for the expression of the subtype.
  - Example: "Sales increase" with only Sales annotated as trigger is sufficient for capturing a SalesVolume event, but not the SalesVolume\_Increase subtype.
  - Status: Not yet implemented.
- Join FILLER and Participant arguments into one participant argument annotation unit.
  - Description: Do not distinguish between FILLER and Participant arguments. TO DO review this. The FILLER scope difference is often not observed by annotators and serves as a source of confusion.

- Example:
- Status: Not yet implemented.
- Pronominal realization of Participants is often not tagged and an adjacent nominal referent is chosen.
  - Description: Pronominal realization of Participants is often not tagged and an adjacent nominal referent is chosen.
  - : Automatic pre-processing: Remove pronominal participants and only use nominal when running experiments. Check Participant mention tokens against list of pronouns and if it contains a pronoun follow PronomCanonRef relation to nominal referent.
  - Example: It’s hard to argue [P&G](wrongly tagged) did not meet [its](missed) growth challenges.
  - Status: Not yet implemented.
- Pronominal or non-specific nominal realizations of Events are often not tagged.
  - Description: Pronominal realization of events are often not tagged. This happens most often when Events are referred to coreferentially with pronouns or with non-specific nouns.
  - : Automatic pre-processing: Remove pronominal events and only use nominal when running experiments. Check event mention tokens against list of pronouns and if it contains a pronoun follow PronomCanonRef relation to nominal referent.
  - Example: It’s hard to argue P&G wrongly tagged did not meet its [growth challenges]. [These](wrongly missed coreferent with previous event) include lagging consumer sales, ...
  - Status: Not yet implemented.

## 7.3 Process improvements

We propose enhancing the annotation process by modularizing the stages of event annotation. This was already the case in SENTiVENT Event Annotation Guidelines v1.0, where the annotation process was described in step-by-step process indicating in each step which annotation units should be considered. However, annotators were not forced to adhere to these steps and applied a more holistic approach to annotation.

We propose splitting the annotation process into sand-boxed steps with each step applied to the corpus before moving on to the next step. In each step only the relevant annotation units and attributes can be annotated. In this manner, annotators do not have to consider all rules for all annotation units at once. This avoids cognitive overload and facilitates consistency during training and annotation phases.

## 7.4 Implementation and tooling improvements

WebAnno remains the best choice as of writing for a stable and complete annotation platform.

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