

## Businesses Need Three Vocabularies

### 1 Summary

A suggestion that a business needs (at least) three vocabularies to support communication with different audiences. The vocabularies require different terminology but represent the same concepts, so would be drawn from a common terminological database.

### 2 Semantic Communities and Speech Communities

If you're in a business, you're a member of a *semantic community* – a group of people who share understanding of a set of concepts. Some outside people closely associated with your business, such as suppliers, customers and regulators, also need to understand your concepts, so will be part of this semantic community.

A semantic community shares understanding of concepts by writing definitions and getting consensus on them. The definitions have to be written in some natural language. If your semantic community uses more than one natural language – perhaps because your business operates in a multilingual country, such as Canada or Switzerland, perhaps because it operates in several countries – it will have a *speech community* for each language it uses. You would be a member of at least one speech community within your semantic community.

Your business will, of course, have to manage content overall to ensure consistent meanings of concept definitions in different languages.

### 3 Multiple Speech Communities in the same Natural Language

Within each natural language it uses, your business needs a vocabulary – the terms it uses to represent the concept definitions. In practice, it would typically need at least three vocabularies, each with different terminology for the same concepts:

- Internal, for employees: this vocabulary will typically include jargon, abbreviations, transaction codes, form numbers, etc.  
But much of it will be in generally-understandable business language. It would usually be the most comprehensive vocabulary, and many of its terms are likely be used in other vocabularies.
- Legal, for contracts, product and service specifications, compliance reporting, etc. The vocabulary would be formal, would include standard legal and industry terminology, and would be strictly policed.
- Public, for advertisements, public-facing web sites, scripts for helpdesks, etc. The vocabulary would be in everyday language - and probably also be strictly policed.

There would probably also be smaller specialized speech communities, such as accountants, engineers and compliance officers. Their vocabularies would usually be drawn from the employees' and legal vocabularies, supplemented by terms adopted from their professional practices.

### 4 Terminological Dictionaries

Good terminology practice is to choose one of the synonyms for a concept as the preferred term and use it consistently. When you have multiple vocabularies for the same set of concepts:

- A synonym for a given concept in one vocabulary may be the preferred term for that concept in another vocabulary.
- A synonym might not be a preferred term in any vocabulary – but may be a synonym in more than one vocabulary.

Managing multiple vocabularies at the level of individual concepts is complicated. Providing each vocabulary as a *terminological dictionary* is simpler. A terminological dictionary is a concept-centred dictionary, in which all synonyms represent the same concept, as opposed to a conventional reference dictionary (such as Merriam-Webster or Oxford) in which each synonym for a term has its own definition<sup>1</sup>.

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<sup>1</sup> There is an informal introduction to Terminological Dictionaries at [http://www.governanceauthors.org/?page\\_id=30](http://www.governanceauthors.org/?page_id=30)

Each speech community within your business would have a terminological dictionary - in its own language - that would be a view of a shared terminological database: a structured subset delivered as a report, or the output from a canned query, or a live view via a custom user interface.

### 5 Speech Community terminological dictionaries in IT systems

With a terminological dictionary the people in a speech community have a vocabulary to talk and write about the business. They can also interact with other speech communities in the business on the basis of shared concepts and easy access (via the terminological database) to alternative terminology.

A terminological dictionary also provides the basis for user interfaces to IT systems – titles and labels on screens, reports and apps; help text; FAQs – consistent with the business language of a speech community.

### 6 An example: Flying to, from and within the USA

#### 6.1 Disclaimer

This example uses a simplified version of vocabularies used by airline speech communities. It is about the language used, not the business processes they describe or supporting technology such as editors and web sites.

#### 6.2 The Customer-facing Vocabulary

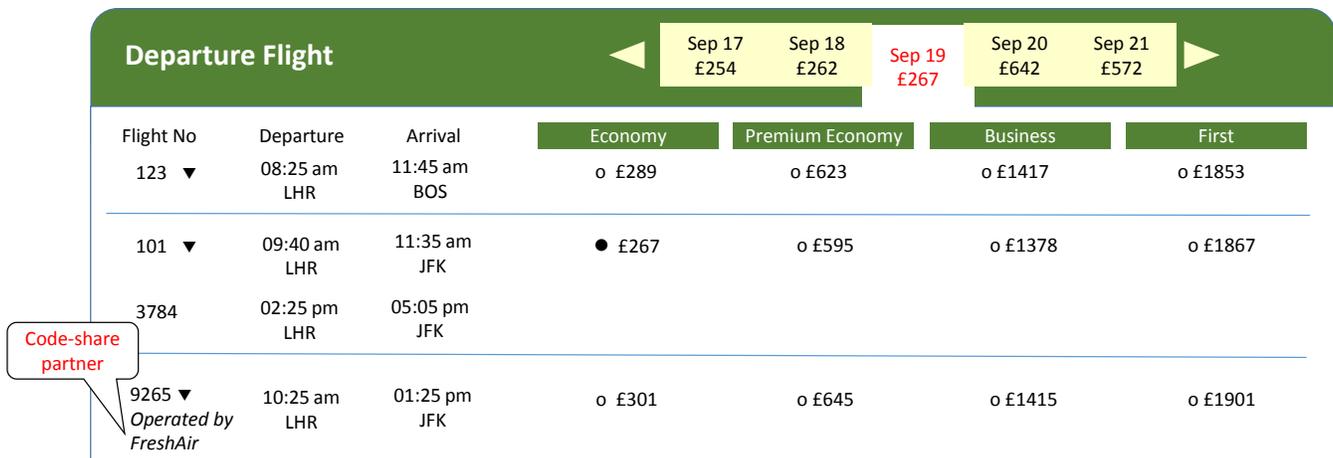
Customer-oriented examples are illustrated as if using a (fictional) airline web site, but this example is not about web bookings. The same vocabulary would be used for a booking by phone with the airline, or in person at one of the airline’s sales offices, or (for a given airline) via a travel agent.

When you want to book travel you’ll be probably be offered three options: Return, One-Way or Multi-City.

Whichever option you select, you’ll probably be asked for your airline preferences: (i) The airline you are dealing with (including any code-share partners); or (ii) members of the airline’s alliance<sup>2</sup>; or (iii) any airline.

#### Return and One-way

If you select ‘Return’, you’ll be asked for: departure and arrival airports; travel dates; and preference for displaying results. A preference for ‘Price and schedule’ would show you prices and schedules for several days before and after your requested travel dates, as illustrated in figure 1.



Departure Flight			Sep 17 £254	Sep 18 £262	Sep 19 £267	Sep 20 £642	Sep 21 £572
Flight No	Departure	Arrival	Economy	Premium Economy	Business	First	
123 ▼	08:25 am LHR	11:45 am BOS	o £289	o £623	o £1417	o £1853	
101 ▼	09:40 am LHR	11:35 am JFK	● £267	o £595	o £1378	o £1867	
3784	02:25 pm LHR	05:05 pm JFK					
9265 ▼ <i>Operated by FreshAir</i>	10:25 am LHR	01:25 pm JFK	o £301	o £645	o £1415	o £1901	

Figure 1: Departure options for given departure and arrival airports and requested date

<sup>2</sup> An agreement between airlines to cooperate substantially. Most of the large passenger airlines are each a member of one of three major alliances: Oneworld, SkyTeam or the Star Alliance.

You'd then be offered options for your departure flight – perhaps several dozen - with several types of fare: typically four types for an international flight (as in the example), two for domestic, possibly three for transcontinental domestic.

The fares in the example are for round trips. When you've selected your departure flight you'll be offered a similar list for your return flight.

If you requested 'One-Way', you'd be offered the options only for the Departure flight, but at higher prices than as the outward part of a round trip.

### Multi-city

If you selected 'Multi-City', you'd be asked to choose a fare type (called 'Class' and selected as 'Premium Economy' in the example below). Then you could define an itinerary of, typically, up to 6 or 8 flights. You'd be offered different prices for your selected fare type on your chosen dates, as illustrated in Figure 2.

Multi-City Itinerary				Class	
				Premium Economy ▼	
	From: City or Airport	To: City or Airport	Departure Date		Departure Time
Flight 1	LHR	JFK	Sep ▼	19 ▼	Morning ▼
Flight 2	JFK	DCA	Sep ▼	22 ▼	02:00 pm ▼
Flight 3	BOS	LHR	Sep ▼	26 ▼	Early Evening ▼

Figure 2: Specification of a multi-city trip

There is a gap in this itinerary between DCA (Washington) and BOS (Boston). This is allowed and you'd make your own arrangements for it. The itinerary is booked as a single-ticketed trip for each passenger on the booking.

### 6.3 The Employees' Vocabulary

Airline employees (and travel agents) have a larger vocabulary than airline customers. They also have different terminology. For example, fares are defined by classes of travel, beginning with a class code (a letter of the alphabet), as illustrated below<sup>3</sup>.

Class		Code(s) beginning with	Notes
First	Full Fare	F	International fare, refundable without purchase restrictions or fees for changes to the itinerary.
		P	Premium class on two-class domestic flights and three class transcontinental flights.
	Restricted	A	May be non-refundable and often have purchase restrictions (such as advance purchase, length of stay) and fees for changes.
Business	Full Fare	J,D	Premium service on three-class international and transcontinental flights. Refundable without purchase restrictions or fees for changes.
	Restricted	I	May be non-refundable and often have purchase restrictions (e.g. advance purchase, length of stay) and fee for changes.
Economy	Full Fare	Y, B	Refundable without purchase restrictions or fees for changes
	Refundable	H, K	Lowest refundable international fare that has few or no purchase restrictions or fees for changes.
	Restricted	C,G,L,M,N,Q,S,V,W	Lowest available fare on a flight. Usually non-refundable and have purchase restrictions (e.g. advance purchase, length of stay, Saturday night stay for round-trip). If changes are permitted, fees will be charged.

<sup>3</sup> Class codes are (broadly, via international agreements) industry standards, but there are differences between airlines in what some codes mean, especially in those used for restricted economy fares. Some class codes are not used by some airlines.

Employees refer to fare classes by class codes (A-class, J-class, Y-class, etc.) rather than the fare types shown on customer-facing documents. For example, in the shared terminological database, 'A-class', 'F-class' and 'P-class' would designate specializations of the concept designated by (the user-facing) term 'First Class'.

Employees in some airlines call 'multi-city' trips either 'circle' trips (the departure airport is the return airport) or 'open-jaw' trips (the departure airport is not the return airport). A gap in a multi-city itinerary is a 'surface sector' usually called an 'ARNK' (abbreviation for 'arrival not known', pronounced 'arunk').

Employees also need to police (so require vocabulary for) infringements of airline rules. An example is 'back-to-back ticketing'. Suppose there is a round trip discounted fare between a city pair, say New York and Chicago, if the stay includes a Saturday night. A regular commuter from New York who spends Tuesday to Thursday in Chicago each week could buy round-trip tickets in pairs: one from New York on Tuesday of week 1, returning on Thursday of week 2; and one from Chicago to New York on Thursday of week 1, returning to Chicago on Tuesday of week 2. This violates airline rules and could result in denial of service.

### 6.4 The Legal Vocabulary

The legal vocabulary usually supports compliance with both regulations and contracts.

#### Regulations

American civil aviation is regulated by the [Federal Aviation Administration](#) (FAA), an agency of the United States [Department of Transportation](#) (DOT). Many of its regulations originate with the [International Air Transport Association](#), which is a trade association that has no legislative powers.

For example, the rule 'Enhancing Airline Passenger Protections'<sup>4</sup>, states what categories of airlines and airports the rule applies to, and provides definitions for: cancellations, delays, oversales and compensation for denial of boarding, contingency plan for lengthy delays, price advertising, response to consumer problems.

The rule also defines the content of reports that must be sent to the DOT, and the notices and notifications to be provided to customers. These use the vocabulary of the rule, which in some parts differs from the customer-facing and employees' vocabularies. For example, it uses the term 'wheels-off time' for the actual take-off time of a flight.

#### Contracts

The contract between you as passenger and an airline has two parts: the confirmation of your booking and the airline's Conditions of Carriage<sup>5</sup>, usually presented in (more or less) business-friendly language, with some of the vocabulary from regulations.

Most airlines are protective of their freight contract terms and conditions, and require registration that includes agreement to non-disclosure, so they can't be used as examples here. However, terms and conditions are usually based on the [IATA Air Waybill – Conditions Of Contract](#) and use much of its vocabulary.

### 6.5 Speech Communities' Vocabularies

Within a semantic community, vocabularies of speech communities that share a given natural language are typically related in up to five ways:

- Scope
- Shared terms for the same concepts
- Different preferred terms and synonyms for the same concepts
- Homonyms
- Different levels of generalization

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<sup>4</sup> Published in the Federal Register/Vol. 76, No. 79/Monday, April 25, 2011/Rules and Regulations. The rule affects the Code of Federal Regulations Title 14: Aeronautics and Space, Parts §244, §250, §253, §399.

<sup>5</sup> As an example, see <https://www.aa.com/118n/customerService/customerCommitment/conditionsOfCarriage.jsp> for US travel and <https://www.aa.com/118n/Tariffs/AA1.html> (on file with the DOT) for international travel.

### Scope

A speech community that shares a given natural language within a semantic community may not routinely require all the concepts shared by the semantic community.

For example, the people in an airline who deal with customers probably don't need to concern themselves very much with compliance reports made to the DOT, but would need to know about contract rules. They would not routinely need the entire legal vocabulary. Providing only the relevant parts – with the option to access the full legal vocabulary as and when needed – would support greater ease of use and easier quality assurance.

### Shared terms for the same concepts

The same terms may be used across all the speech communities' vocabularies for some – perhaps many – concepts. Some typical airline examples are:

Blackout period	A period during which some types of fare are not available or some types of ticket cannot be used.
Minimum connection time	The legal minimum time necessary to change planes at a given airport.
Oversold flight	A flight that has more passengers holding confirmed reservations than there are seats available.
Unaccompanied child	A minor under 15 years of age not accompanied on the same flight and in the same compartment by a passenger at least 16 years of age or parent regardless of age.

There may also be synonyms within a given speech community's vocabulary. For example, airline employees often use 'unaccompanied minor' or 'UM' for 'unaccompanied child'.

### Different preferred terms and synonyms for the same concepts

Differences in terms for the same concepts often occur from two sources:

- Terms in vocabularies adopted from external sources - such as regulations, industry glossaries and good practice descriptions, authoring style guides - that are not relevant to all the speech communities.
- Custom and work practice: in particular, employees will develop short cuts for efficiency and clarity within their work – abbreviations, jargon, using transaction codes and form numbers to refer to some kinds of action or decision – and include them in their working vocabulary.

Some typical examples are given below:

Customer-facing	Employees	Legal
aircraft, airplane, plane	equipment	aircraft, airplane
airline	carrier	airline, carrier, air carrier
airline code	airline designator, DESIG, IATA code	airline code, carrier code
booking code	class code	class of service code
carry-on bag	cabin bag	accompanied bag
checked bag	hold bag	checked bag
passenger	PAX	passenger, traveler
record locator	PNR number	reservation record number
take-off time	EFC time, wheels-up time	wheels-off time
UTC, GMT	Zulu	UTC

A preferred term in one speech community's vocabulary may be a synonym in another speech community's vocabulary. A synonym might not be a preferred term in any speech community's vocabulary.

### Homonyms

There generally aren't many homonyms in typical airline vocabularies, and it's usually easy to distinguish their meanings by context. A few examples are:

Designation	Vocabulary	Meaning
miles	Employees'	Unit for a nominal distance between airports (not actual miles flown)
	Customer-facing	<ol style="list-style-type: none"> <li>1. When booking, <i>miles</i> in 'airports within <i>n</i> miles' are actual miles of ground travel</li> <li>2. In loyalty programs, <i>miles</i> are units that can be redeemed for rewards such as flights and hotel stays. They are awarded for the nominal distance between the airports of flights taken, but may also be given: for purchases from associated businesses such as hotels and car rental; in promotions for credit cards; and as bonuses. Some airlines also allow direct purchase of <i>miles</i> for cash.</li> </ol>
	Legal	For maintenance compliance and reporting: actual miles flown, as recorded by an aircraft's instruments.
commuter	Employees'	<ol style="list-style-type: none"> <li>1. A category of passenger</li> <li>2. A category of flight</li> </ol>
	Customer-facing	A category of passenger
	Legal	A category of airport (defined in the Code of Federal Regulations: 14 CFR §244.1)
pitch	Employees'	The angle of an up or down movement of the nose of an aircraft
	Customer-facing	The distance between seat rows on an aircraft (determining the leg room)
rotation	Employees'	<ol style="list-style-type: none"> <li>1. One complete round trip: Airport A to Airport B to Airport A.</li> <li>2. The change in upward pitch (nose moves up) of an aircraft, particularly when it starts to climb after take-off.</li> </ol>

### Different levels of generalization

In the Employees' vocabulary, the fare classes identified by class codes are specializations of the fare types used in the Customer-facing vocabulary. In our fictional airline, an 'Economy' fare type may be specialized as fare classes starting with B, C, G, H, K, L, M, N, Q, S, V, W or Y. See figure 3 for an example.

Departure Flight						
		Sep 17 £254	Sep 18 £262	Sep 19 £267	Sep 20 £642	Sep 21 £572
Flight No	Departure	Arrival	Economy	Premium Economy	Business	First
123 ▲	08:25 am LHR	11:45 am BOS	o £289	o £623	o £1417	o £1853
Aircraft: Boeing 777		Meal	Lunch	Lunch	Lunch	Lunch
Flight Miles: 3452			Snack	Snack	Snack	Snack
Travel Time: 8 hrs 20 mins	Advance Purchase		7 days	21 days	28 days	28 days
	Changes		No	Fee	Fee	Yes
	Refundable		No	Fee	Yes	Yes
	Booking Code		K	W	P	A
	Cabin		Economy	Economy	Business	First

Figure 3: One of the options for a departure flight, showing the fare class ('Booking code') for each fare type

The specialization is selected by the choices you make in requesting a booking. The first step is whether the departure and arrival airports are in the same country; some fare classes are valid only for domestic routes and some only for international. The second is the pricing option you request, such as 'Lowest Fare with restrictions' or 'Refundable fare'. You'd be offered the fare class that matched your request for each fare type ('Economy', 'First' etc.) offered for your routing.

You can then ask further questions about restrictions on the offers available (on the web site, you'd do this by clicking the 'show detail' arrow next to the flight number). The fare class, 'Booking Code' in the example, would be shown but you'd probably not be interested in the code itself - more in what restrictions apply to the code.

In other options for the flight and date, you're likely to see different prices and restrictions and different booking codes, especially for economy fares. The questions you ask (the options you select) determine how an Economy fare, from your customer perspective, is specialized into a K-class fare, from an employee perspective.

From a terminological database point of view, this way of relating different levels of specialization is a special case of homonyms. The location of the term ('Economy fare' in figure 3) within the layout of a form, report or sequence of screens provides the disambiguating context for which there is exactly one meaning of the term (the meaning of 'K-class fare').

## 7 A Shared Terminological Database

In a business of any substantial size, it is very likely that different people will be responsible for the different kinds of governance documents, with at least the three subcommunities suggested here. There may also be others.

The suggestion here is that the sub-communities should share a terminological database, but that each needs to see only its own vocabulary – with the ability to reference other sub-communities' vocabularies as and when needed.

The appendix to this note suggests a simple data model for a terminological database that could support this kind of use.

### 8 Appendix: Simple View of a Terminological Database

This appendix is likely to be more relevant to those who are interested in how a shared terminological database might be designed, than to those who are concerned only with using terminological dictionaries for authoring governance documents.

#### 8.1 Data Model

Figure A1 is a sketch of a data model for a terminological database.

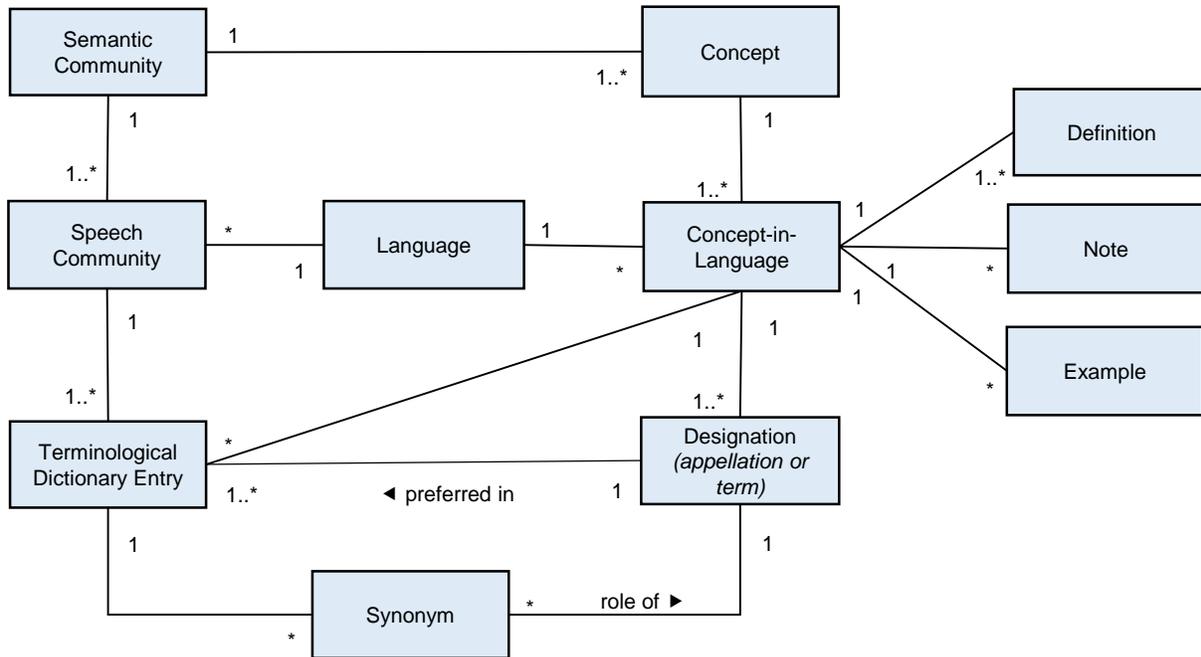


Figure A1: Sketch of a relational model for a terminological database

Figure A1 is greatly simplified, but the model would support multiple semantic communities (businesses or similar organizations), each using multiple natural languages, with multiple speech communities using each natural language.

The entity types (apart from *Semantic Community* and *Speech Community*, and the structural *Concept-in-Language*) are defined in the ISO standard *ISO 1087-1\_2000 Terminology work - Vocabulary - Part 1: Theory and application*<sup>6</sup>

*Concept* is language-independent; it might contain no more than an identifier (like the *entry number* required by the ISO standard *ISO 10241-1:2011 Terminological entries in standards -- Part 1: General requirements and examples of presentation*<sup>7</sup>). Each concept is connected to each language used by the semantic community and to the documentation of the concept in that language, by an instance of *Concept-in-Language*.

ISO 1087-1 allows for more than one definition of a concept, but they must be semantically equivalent – i.e. have the same intension.

<sup>6</sup> [www.iso.org/iso/catalogue\\_detail.htm?csnumber=20057](http://www.iso.org/iso/catalogue_detail.htm?csnumber=20057) (payment required)

<sup>7</sup> [www.iso.org/iso/home/store/catalogue\\_tc/catalogue\\_detail.htm?csnumber=40362](http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=40362) (payment required)

### 8.2 Access to business vocabularies

Figure A2 illustrates the navigation path through the model for a terminological dictionary – the vocabulary – for a speech community:

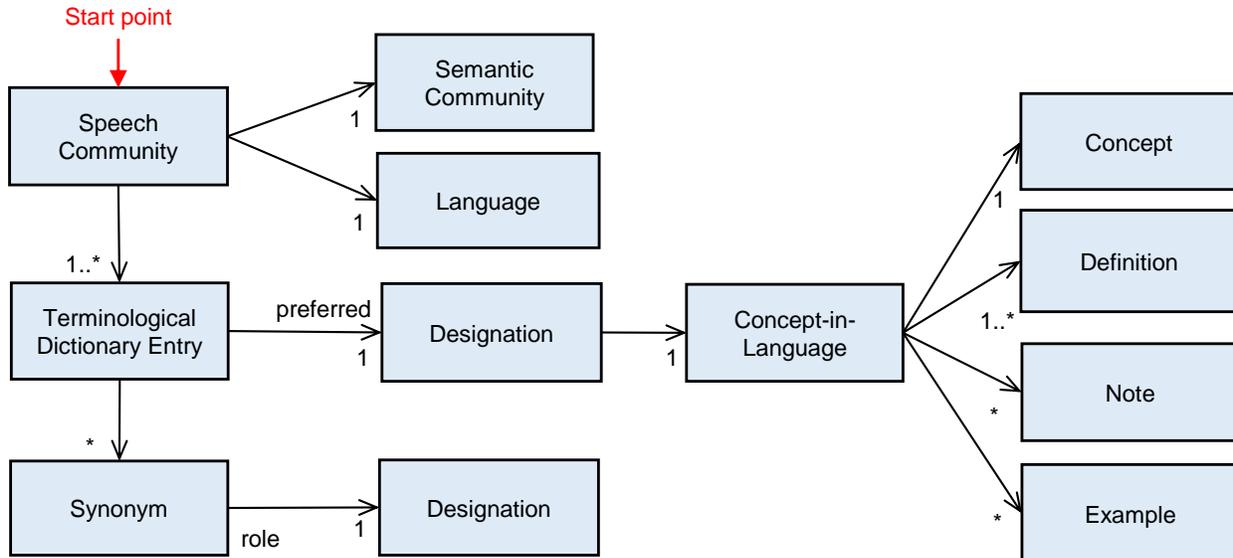


Figure A2: Navigation path to deliver a terminological dictionary

There are some constraints on the subset of the model delivered by the navigation path that ensure consistency, but are difficult to include on the model (other than by text annotation). Two of the most important are:

- The Language of a Definition is the Language of the Speech Community that includes the Definition in its terminological dictionary.
- The Concept of a Definition that is included in the terminological dictionary of a Speech Community is a Concept of the Semantic Community of the Speech Community.

### 8.3 Content of a business vocabulary

Figure A3 illustrates the sequential structure<sup>8</sup> of the delivered content of a terminological dictionary.

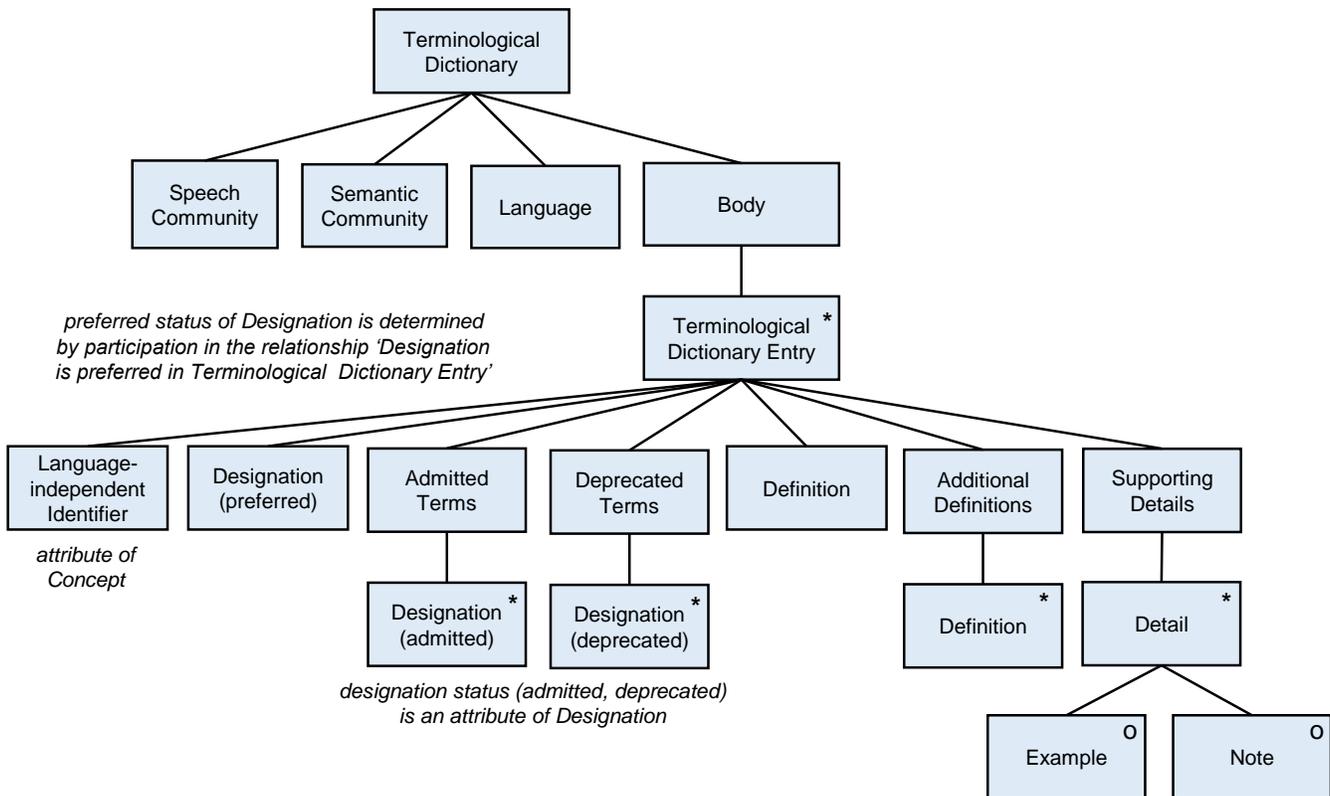


Figure A3: Content of a terminological dictionary accessed in a shared terminological database

The structure follows the sequencing conventions of ISO 1087-1, which complies with ISO 10241.

<sup>8</sup> In the upper right corners of boxes, asterisks indicate iteration, circles indicate optionality. This notation for serial structures was introduced in 'Principles of Program Design', Jackson 1975 (ISBN-10: 0123790506, ISBN-13: 978-0123790507)