Semantic relations in the field of retailing

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Abstract: Understanding the semantic relations between terms in specialized texts is of critical importance in translation and terminology, and generally speaking in learning from texts. Our research highlights the advantages of formalizing them in order to build hierarchies and sets of horizontal conceptual relations (i.e. process-oriented relations) for knowledge acquisition. This paper discusses a method for extracting domain-specific semantic relations in specialized texts.

Obviously, some texts are more appropriate than others in this regard. ‘Knowledge-rich’ texts such as encyclopaedia and textbooks are considered good materials because of the density and richness of thematic information. Considering them as such, we used the encyclopaedic articles of the Dictionnaire analytique de la distribution /Analytical Dictionary of Retailing.

We retrieved over 3000 terms semantically related to all 350 headwords of the Dictionary, and grouped them into 28 classes of relations (paradigmatic, i.e. generic, specific, agent, goal, instrument, recipient, location, etc., and also syntagmatic, such as related verbs and adjectives). This paper discusses in particular the generic, agent and property relations and examines the linguistic markers that permit their retrieval.

Keywords: specialized knowledge organisation, lexico-semantic relation, bilingual terminology, translation, generic, agent, property

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Introduction

Understanding the semantic relations between terms in specialized texts is of major importance in translation and terminology, and generally speaking in learning from texts. This paper discusses a method for extracting domain-specific semantic relations for the acquisition of knowledge in specialized fields — in this case, retailing. Is it possible to identify classes of relations that capture most of the information pertaining to key concepts? Based on our research, we found that in this particular field, the property and agent relations provide fundamental information on the concepts, along with the more canonical relations of generic-specific and part-whole.

In the first section we will briefly present our goals in identifying lexico-semantic relations (LSRs) and the model used. Then we will discuss some of the results. In the third section, we will analyse a few lexical relation markers and explain the limits that we have found, and why we resorted to non-linguistic features in order to build some sets of related terms, especially the property one.

1. Identifying semantic relations in retailing

1.1. Knowledge structures

This research falls within the broad field of the organisation and processing of textual information for terminology and documentation purposes in translation/interpretation. The retrieval of LSRs — be it automatic or human — appears to be the basis for many tasks in terminology and translation, including:

- lexical research and the interlinguistic comparison of the terminological units referring to concepts;
- understanding of concepts in a specialized field and the analysis of information provided in texts; and
- acquisition of knowledge to be stored in semantic memory, on which professional expertise is built.

In specialized translation, the comprehension of technical terms and the acquisition of knowledge are prerequisites. Terminology articles should serve the translator’s need to fully understand concepts (and acquire vocabulary). In this perspective, terminology without complex semantic relations would fail to achieve its goals (Dancette & Halimi, 2005). This is also the “termontography approach in which the ‘units of understanding’ (Temmerman 2000) as well as their intercategorial relations are [...] structured in a common knowledge base or categorisation framework” (Kerremans 2004: 268), or the frame-based approach used by Faber (2004) and Faber et al. (2005), among others.

From the start, the authors designed the Dictionnaire analytique de la distribution /Analytical Dictionary of Retailing (Dancette & Réthoré, 2000) (hereafter the Dictionary) to meet two goals. The first was to serve as a textbook on key notions. The main articles are encyclopaedic in nature - one to three pages long. Created with a focus on concision, relative exhaustivity and coherence, they offer knowledge-rich contexts, according to Meyer’s definition, “indicating at least one item of domain knowledge that could be useful for conceptual analysis.” (2001:28). The second was to describe and
explain the relations between terms. In the articles, specific headings, i.e. ‘relations internotionnelles’ highlight conceptual links between terms. (See the shortened version of the article INVENTORY in Appendix 1.)

After publishing the printed dictionary, we formalised tables of LSRs and prepared the electronic version including these tables. (The electronic version is on the site http://olst.umontreal.ca/ressources/retailing). This addition gives added value as compared to a conventional dictionary online, as it allows for both traditional consultation by words and, more dynamically, by classes of relations. With the LSR model, a search for classes of semantic relations allows the grouping of related terms, thus facilitating comprehensive learning based on the logical presentation of information. (See Appendix 2 showing the web page of the article INVENTORY with the list of related terms (and their classes) and the hyperlink to the source sentence in which they occurred.)

The field of retailing can be represented as a dynamic construct made up of clusters of processes and events that translate into knowledge structures. For example, the term store (and all its specifics) is semantically linked to many terms denoting typical actions, events, processes and related entities, activating frames, such as SELLING, STAFF, GOODS, CUSTOMERS, MARKETING TOOLS, STRATEGY, BUSINESS GOALS, CASH REGISTER, INVENTORY, DISPLAY UNITS, etc. Broadly defined, a frame is any system of concepts.

Our LSR model is seen as a tool for building hierarchies and sub-hierarchies, as well as sets of horizontal relations (or process-oriented relations2) showing connections between terms on the basis of typical features/events. A very general hypothesis is that domain knowledge to some extent can be organized according to types of events that belong to larger knowledge structures.

1.2. Previous versions of the model

The first step in the process of developing an LSR model was to identify and name the relevant relations between terms. In the printed dictionary the related terms were already identified typographically in bold, as seen in the example below:

L’étiquette (label) comprend généralement un code-barres (bar code). Le code-barres contient des informations telles que […] qui seront lues à l’aide d’un lecteur optique (optical reader),

where code-barres is understood as a part of etiquette, and lecteur optique as an instrument.

The models that we tested all have the same goal: to identify the elements of knowledge structures to be entered in the description of concepts.

1.2.1. Defining phrases

2 In Dancette & L’Homme (2004), we call them circumstantial relations.
Defining phrases were used to group together terms belonging to the same lexical field. The decision to include or not a type of information is only based on expert knowledge. For example, the definition of SALE is composed of phrases that contain typical information on PRICE, CATALOG, LOCATION, NATURE OF MERCHANDISE, SALES STAFF, ELECTRONIC SUPPORT, RANGE OF PRODUCTS, etc.

According to these elements of its definition, AUCTION SALE could be linked to other terms denoting either generic or opposed concepts. The terms highest-bidder sale, catalog sale, in-store retailing, non-personal selling, electronic sale and upscale sale are linked to AUCTION SALE by at least one type of information, as shown in Figure 1 below.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definitory phrases</th>
<th>Related terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auction sale</td>
<td>Non-fixed price</td>
<td>Highest-bidder sale</td>
</tr>
<tr>
<td></td>
<td>Catalog</td>
<td>Catalog sale</td>
</tr>
<tr>
<td></td>
<td>Typical location</td>
<td>In store retailing</td>
</tr>
<tr>
<td></td>
<td>Used goods</td>
<td>Charity sale</td>
</tr>
<tr>
<td></td>
<td>No salesperson</td>
<td>Non-personal selling</td>
</tr>
<tr>
<td></td>
<td>Electronic support</td>
<td>Electronic sale</td>
</tr>
<tr>
<td></td>
<td>Luxury Items</td>
<td>Upscale sale</td>
</tr>
</tbody>
</table>

Figure 1. Auction sale and its related terms

However, this model proved insufficient for our purposes. The first limit is that this kind of pairing of terms by the information they share does not help to identify the nature of the link. Another limitation is that it does not apply to syntagmatic relations such as those that hold between the terms described and their verbal co-occurrents and collocates, so important in translation. A more important objection is that the identification of defining information is based on the previous knowledge of each group of concepts. Because there are as many types of information as there are classes of concepts, the model is not adequate for making generalisations and abstractions. For example, some of the types of elements of information necessary to describe an event such as an AUCTION SALE or a PROMOTION are of no use to describe physical entities such as a CASH REGISTER or a GONDOLA.

1.2.2. Lexicological model

Explanatory combinatory ial lexicology (Mel’čuk et al., 1995) offers a more powerful model that allows for generalisations. It has been used in terminology with some success. Analysis and discussion is presented in Dancette & L’Homme (2002, 2004), L’Homme (2002, 2003), and Dancette (2003). Lexical functions (LFs) account for both paradigmatic and syntagmatic semantic relations. Below are some examples in our field:

Anti(durable goods) = non durable goods

Instr(bar code) = optical reader
This lexicological model offers rich linguistic information on the use of lexical units. However, its subtleties are not all useful when one is more concerned with concepts referred to by terms (“units of understanding”) than lexical units and their grammatical functioning. For example, differentiating between all the noun forms having the role of arguments (S1, S2, S3, etc.) is of lesser use for a human speaker, i.e. who understands the language. Similarly the differentiation between the verbs linked to a noun by relations such as those represented by the functions Oper, Funct, Real and so on is of limited use in a translation situation where the understanding of the meaning of technical terms is the first priority.

On the other hand, the treatment of adjectives provided for in the explanatory combinatorial model poses a real problem in terminology, because relational adjectives enter into the composition of complex nouns. For example, Dutch in Dutch auction, or durable in durable goods form terminological combinations that are considered inseparable.

Our model, though greatly inspired by Mel’čuk’s lexical functions model, departs from it in order to cater to the specific needs of translators, who tend to be more concerned with the links between terms (paradigmatic relations) than the syntagmatic functioning of words, even if syntagmatic relations are also of great importance and have been retrieved, as we will see below.

1.2.3. The LSR Model (Dancette 2003)

The 350 articles of the Dictionary have been systematically searched for terms linked by an LSR. For continuity sake, we kept the same symbolic notation in the present paper, though in the Dictionary the classes of relations are not presented in the form of lexical functions.

Gener(vente aux enchères) = vente au plus offrant

Ag(vente aux enchères) = commissaire priseur; enchérisseur; meilleur offrant

Obj(vente aux enchères) = bien ou titre
Loc(vente aux enchères) = salle de vente

where Gener = generic, Ag = agent, Obj = object, and Loc = typical location, the term between parentheses (variable) is the headterm of the dictionary article, and the term following the equation sign (value) is the term linked to the headterm by the relation.

2. Results

2.1. The conceptual structure of retailing

The graph in Figure 2 below shows the conceptual representation of retailing. Retailing is typically seen as an activity organized around the point of sale. It is linked to wholesale and the physical distribution of goods (A); it is managed by people having activities in different spheres (B); it is located in specific areas (C); and finally it addresses consumers (D).

Figure 2 – Conceptual structure of retailing
Defined as a system of concepts, RETAILING entails many sub-concepts. These concepts and sub-concepts are organized into categories such as agents, activities, places, processes, patients, results, instruments, measures and strategies. All categories are related. If we see terminology as reflecting the conceptual system, then terms are the labels of conceptual frames, i.e., constructs that encode entities and event types that are basic to human experience, in a given field.

2.2. Inventory of relation types

Before we could find regularities facilitating semi-automatic retrieval, manual extraction was necessary in order to identify and name the relevant types of LSRs. Relevancy was defined as the ability of the related term to provide information on the field of retailing. It could be ascertained that informativity is linked to the proximity of the term to key concepts in the field. For example, in the article under PALLLET, we find the sentence:

Pallet = A loading platform used for merchandise (boxes, bags, bottles) during their handling, shipping and storage. (...) The pallet is made of wood, plastic or aluminium.

The words wood, plastic, aluminium have been discarded as relevant terms, because they are more closely linked to general knowledge than are handling, shipping and storage.

We found over 2,000 related terms, classified in 28 categories. Appendix 3 gives the complete list of classes of LSRs, with their symbol, their meaning, the classification criteria and an example for each.

This inventory raises some points for discussion: it proved necessary and sufficient to retrieve the most important information contained in the encyclopaedic articles of the Dictionary. We believe, however, that such a typology is domain-specific: it is not universal and cannot apply to all the fields of human knowledge with the same results. For example, the cause-effect relation, so rich in medicine (Marshman 2007) and biopharmaceuticals (Marshman 2002, Nuopponen 2005) is very poor in our field (we found only one case). In bio-industries, the relations studied and included in the Biolex Dictionary (Gaudin 2004) are: agent, application, object, typical action, apart from the hierarchical ones of generic-specific, antonyms and co-hyponyms.

2.3. Frequency of the LSR classes in our corpus

The more frequently observed classes of relations linking terms to the headterms were: specifics (Spec) (392 cases), generics (Gener) (357 cases), part-whole relations^{3} (Part) (186 cases), properties (Prop) (165 cases), agents (Ag) (126 cases), means (Med) (105 cases), contextual synonyms (Synuse) (97 cases), instruments (Instr) (95 cases), and contrastives (Contr) (78 cases). (The number of related terms in each class is shown in Appendix 4). Again, another corpus of specialised texts could display a very different

^{3} This class includes the 36 relations of stages, since stages can be seen as parts of a process.
configuration, making a comparison all the more interesting because lexico-semantic classes appear to be indicators of the ways fields of knowledge are conceptualized.

2.4. Predominance of nouns as a grammatical category

Since the authors’ choice was to describe terms denoting entities and events around which structures of knowledge are organised, it was expected that nouns would be the predominant grammatical category. Apart from synonyms and antonyms, the related terms reflect mainly hierarchical relations (generic, specific, part-whole) and ontological relations (agent, instrument, location, cause, etc.).

Nevertheless, in addition to nouns, a relatively large number of verbs have also been processed (74) as they help characterise a specialized language. They belong in three categories:

- semantic derivations (BARTER, to barter; SCANNER, to scan; AUCTION, to auction, to auction off);
- collocations (BANNER, to set up a banner);
- verbs denoting actions linked to a concept (AUCTION, to bid, to sell to the highest bidder, to hawk).

Few adjectives were processed as autonomous units (16). Some examples of these included: exclusive (sale), well-patronized (store), end-of-line (goods), second-hand (goods), out of stock (item). Even fewer adverbs were processes as such, ex.: cash (to pay / to buy), door to door (to sell).

The relative scarcity of adjectives and adverbs is a point we need to discuss as it results from our methodological choice and the necessity of multilingual terminology. When an adjective combines with a noun and acquires a technical meaning, we process the terminological collocation as a multi-word term. For example, the adjectives vertical (in vertical integration) or durable (in durable goods) are conceptually significant only when related to the nouns integration or goods.

This method of processing terminological collocations as single terms also has a practical motivation: English and French (not to speak of other languages dealt with in our project) do not build their terms with the same syntactic forms. For example, the noun sundries is articles divers (N + Adj) in French; shopping good is bien d’achat réfléchi (N + Adj). In a bilingual approach based on equivalents, divers and réfléchi cannot be listed as adjectives in French, with no English equivalent adjectives. The examples of such anisomorphisms are numerous.

2.5. Unclassified LSRs

In order to provide a complete and faithful overview of our endeavour to formalize semantic relations, we must note the number of related terms that seemed important to us but were impossible to process with our model. They correspond to three types of situations:
2.5.1 Indirect relations: When the term is not related to the headterm but to a term related to the headterm

In the article SHOPPING CENTER, we have the sentence: ‘Tenants pay common area maintenance fees’. Common area maintenance fees is related to the agent tenant; it is indirectly linked to shopping center.

In the article MAIL-ORDER RETAILING, the sentence says: ‘Payment is done either when the order is placed or cash on delivery (COD)’. Cash on delivery was captured as a relevant term but it relates to ‘mode of payment’, not directly to MAIL-ORDER RETAILING.

2.5.2 Weak semantic links between the term and the headterm

In article DIRECT-MAIL ADVERTISING, the sentence says: To select prospects, retailers use direct-mail lists that they create or buy from a list broker. Here, list broker is an agent of direct-mail list, but not of DIRECT-MAIL ADVERTISING.

2.5.3 Irregular relations because of specific situations (cultural variety and conceptual uncertainty)

Concepts differ in various cultural areas. For example, in North America, a post office is often a part of a drugstore; this is not the case in Europe. There are also concepts that are debated among experts and sometimes contradictorily presented according to the school. For example, for some experts, the DEPARTMENT STORE typifies MASS MERCHANDISING, while for others the two concepts are antagonistic. Therefore we cannot categorically state that post office is a part of drugstore, nor that mass merchandiser is a generic of department store.

In all, some 1,000 terms that were initially marked as significant in the entire corpus could not be captured with the LSR model that links related terms to a headterm. However, because of the repetition of information in different articles of the Dictionary, many of them could be retrieved from a different headterm, minimizing the entropy.

Despite these difficulties, the LSR model for retrieving semantic relations was very productive, though costly in terms of time. Below, we examine the possibility of automating the process through the identification of relation markers.

3. Analysing relation markers

Before looking at the results, we will first define relation markers. We used linguistic (lexico-syntactic) markers only. A linguistic marker is a regular syntactic or lexical form that points to a type of conceptual relation (for example, An X is a Y, X contains A, B and C, where the verbs to be and contain express specifayer and meronymic relations, respectively). A marker may take various surface forms for the same relation. Applications are to be found, among others, in Meyer (2001), Morin (1999) and Séguéla & Aussenac-Gilles (1999) for semi-automatic extraction.
Automatic extraction of LSRs makes a contribution to the development of information management tools, as it should allow for the identification of semantic relations in various texts in a given field. Sanderson Croft (1999), Hearst (1998), Marshman (2007), Marshman & al. (2002), have provided lists of markers observed in large corpora.

As mentioned above, we started manually (so to speak), term by term, guided solely by our understanding of the links between concepts. We searched for relation markers when the recurrence of lexical and syntactic forms indicated the probability of such relations. Because of space limitations in this paper, we will present only the markers found for the generic, agent and property relations. We will show that syntactic and lexical pattern forms gave varying results. The markers were applied with a search by chains of characters. Since we used the French version of the Dictionary, we will give the markers in French.

3.1. **Generic (Gener)**

Markers for hierarchical relations have been listed in Borillo 1996, Hearst 1998, Morin 1999, Condamines et Reyberolle 2000, etc., and give good results.

Three classes of markers were used in our corpus to point to hyperonymy.

3.1.1. \(Y\) est un \(\text{(une forme de) } X\), where \(Y\) is the specific and \(X\), the generic, as in:

\[\text{La marque (brand) est une forme de propriété (property).}\]

This marker was systematically tested in the whole corpus with the search function; it pointed to a true generic-specific relation in more than two thirds of the occurrences. However, a few of the results were rejected, because the second term of the equation was either a comment, as in ‘\(X\) is a case of, an element of, a paradox, etc.’, or when it introduced a metalinguistic comment as in ’\(X\) is a term, a variant, an anglicism, etc.’

3.1.2. \(Y\) fait partie de / appartient à \(X\), as in:

\[\text{Les produits bruns \(\text{(brown products) font partie des biens durables \(\text{(durable goods).}\)}}\]

\[\text{Le centre de grandes surfaces \(\text{(power center) appartient au groupe des centres commerciaux de magasins à prix réduits \(\text{(value retail centers).}\)}}\]

\[\text{La bannière \(\text{(banner) fait partie des médias hors du foyer.}\}}\]

However, the marker \(\text{fait partie/appartient}\) may also indicate a part-whole relation (meronymy) as in the two following examples:

\[\text{La palette perdue \(\text{(lost pallet) [...] fait partie de l’emballage.}\}}\]

\[\text{Le vendeur \(\text{(salesperson) fait partie de l’équipe de vente.}\}}\]
3.1.3. The lexical forms *générique / l’ensemble* ; and conversely *un spécifique de / un type de X*, indicate a generic-specific relation, as in:

*La notion d’*entreprises de vente par correspondance* (mail-order retailer) est plus générique que celle d’*entreprises de vente par catalogue* (catalog retailer).

*Code-barre* est un terme plus générique, alors que *CUP* et *CEAN* sont des types particuliers.

*Le terme grande surface* est un générique qui couvre de nombreuses réalités, notamment l’*hypermarché*, le *supermarché*, le *supermagasin* et la *grande surface minimarge*.

*Le terme monnaie électronique* (electronic money) désigne l’ensemble des cartes […], dont la *carte de débit* (debit card), la *carte de crédit* (…). Thus, extracting this relation is done by automatically searching for recurrent forms. It has been used for the production of lists of co-hyponyms, such as:

![Figure 3: List of co-hyponyms of DISCOUNT STORE](image)

It can also be used to identify hierarchical series (from the specific to the generic), as shown below:

![Diagram](image)

3.2. **Agent (Ag)**
In Weissenhofer’s definition (1995: 148): ‘The terms belonging to the conceptual relationship of AGENT possess a second term element that denotes an animate or inanimate object which can be interpreted as the agent performing the action or activity designated by a concept A’. In our corpus of retailing, this category refers to the legal or natural person who typically makes, is responsible for, owns, manages, issues or uses something.

The agent relation is found using the recurrence of lexical and syntactic expressions belonging to three classes of markers:

3.2.1. $X$ est responsable de $Y$ (a la responsabilité de / a pour fonction / a pour rôle); or, conversely, la responsabilité (la fonction / le rôle) de $X$ est $Y$

The nouns responsabilité / fonction / rôle, or the adjective responsable, point to an agentive relation, as in:

*Le directeur des ventes* (sales manager) *a la responsabilité de la gestion des ventes* (sales management).

*Le marchandiseur* est responsable de l’assortiment et du linéaire.

*Le réassortisseur* (shelf filler), commis responsable du placement des marchandises dans le magasin, [...].

The agentive relation is also recognizable in the semantics of the term itself, as in: chef, responsable marketing, responsable des achats, responsable de rayon, responsable marchandisage, gérant de magasin, directeur des ventes, promoteur, commissaire-priseur, etc.

3.2.2. $Y$ est effectué (géré / exploité / organisé ) par (par l’entremise / grâce à / avec l’aide de, par l’intermédiaire de) $X$, or, with the active verb form, $X$ effectue (gère / exploite / organise) $Y$

Verbs in the active or passive form + a preposition such as par, grâce à or an adverbial clause) may indicate an agentive relation, as in:

*La distribution automatique s’effectue* par l’intermédiaire d’une *distributrice automatique* ou d’un *magasin intelligent*.$^4$

*Un produit* est géré par un *chef de produit*;

*La vente se fait grâce à la présence du vendeur, qui fait partie de l’équipe de vente.*

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$^4$ We consider automatic vending machines and smart stores to be legal persons.
However, some results may not be pertinent, as in: *la vente électronique s’effectue par des moyens électroniques; le test est effectué; l’assortiment est géré selon le principe de [...]*

3.2.3. *X + verb accepting a human agent*

*Le prêteur à gages vend la marchandise;*  
*Le locataire paie un loyer;*  
*Le vendeur intervient;*  
*L’emprunteur récupère son bien;*  
*Le conseiller de vente aide le consommateur;*  
*Le fabricant confie la vente [...] à un nombre limité de détaillants.*

It seems possible, as in the case of generic relations, to formalize the extractions of such relations; thus, these markers are useful.

3.3. **Property (Prop)**

This relation aims to retrieve the terms expressing the technical features attached to the definition of a concept as illustrated by Sager’s example (1990: 34): *compressibility is a property of a gas.* It is a cognitively salient attribute activated by our experience and knowledge of a concept.

The property relation does not belong to the same category of relations as generic-specific and part-whole, which Gaudin (2000: 158) calls intrinsic relations. According to him, extrinsic properties are those that evoke an individual’s (or a group of experts’) relation to the object referred to. The listing of such properties is the basis for an intensional definition of a concept; it can be seen as a matrix of distinctive features whose values characterize each term within a field.

In retailing, experts state, for example, that the length, the width and the depth are indicators that define a PRODUCT ASSORTMENT in a store; or that the price, the life span, the line, etc. are criteria that define a PRODUCT. As a result, terminologists can rely on this information to list the agreed-upon properties that characterize any object.

A property is thus defined as a differentiating feature that helps to position the concept being described in its conceptual system in a given field of knowledge at a given time, and to distinguish it from the other concepts in this system.

From a cognitive point of view — in knowledge organization, or merely information acquisition and understanding — this relation is most interesting because it fosters the grouping and comparison of concepts, according to their defining features.
3.3.1. Markers for the property relation

Here again, we searched our corpus for the occurrence of defined character chains. The lexical patterns observed proved to be less regular than for other relations, and consequently less reliable. We were not totally satisfied with the results and looked for a different approach, albeit complementary, i.e. the agreed-upon definitory features.

3.3.1.1. Prepositions à and en, as in:

produit à forte marge brute; établissement qui écoule ses produits à prix réduits;
emballage à double paroi ou à triple paroi; établissement où l’on peut acheter en libre-service (self-service).

3.3.1.2. Adjective / noun caractéristique, as in:

Le produit générique (generic product) inclut toutes les caractéristiques (characteristics) du produit, y compris la marque (brand) et le conditionnement (packaging).

Le terme magasin minimarge englobe l’ensemble des établissements [...] qui possèdent les caractéristiques suivantes : marges réduites (reduced margins), rotation rapide des stocks (high inventory turnover), service à la clientèle (customer service) limité, ambiance et décor sommaires.

Étiquette (label) = Document d’identification du produit [...] et qui en décrit les caractéristiques (nature, prix, provenance, marque, etc.).

L’aménagement en grille (grid layout) est caractéristique des grandes surfaces (mass merchandisers).

3.3.1.3. Verbs whose meaning carries the idea of PROPERTY, as in:

Le produit détient une part de marché (market share);

Le concessionnaire détient un droit de distribution (distribution right) pour un produit ou un ensemble de produits déterminés.

Il est distributeur exclusif (sole distributor), s’il détient une exclusivité de distribution pour un territoire donné et vend les produits d’un seul fournisseur ou fabricant, à l’exclusion des produits concurrents.

Le contrat est assorti [...] d’un accord d’exclusivité réciproque (reciprocal exclusive dealing);

La gamme de produits (product mix) se définit selon quatre axes : la largeur (width), la profondeur (depth) [...];

Le centre de boutiques spécialisées (specialty center) se distingue des autres
centres commerciaux par [...] l’homogénéité de son assortiment de commerces (retail mix).

3.3.2. Assessment of the results for the relation property

Out of 165 Prop relations identified in our corpus, 62 were introduced by verbs implying an idea of “property”, 12 by the noun or the adjective caractéristique, 14 are indicated by the preposition en, and 13 by the preposition à. The productivity of the search with lexical markers is in fact 66 per cent, which is not excessively low, but not quite satisfactory. Let’s go into more details.

3.3.2.1. Prepositions à and en

The 27 relations introduced by a preposition are all in the form en/à (Adj+N), or en/à (N+Adj). Obviously, these forms may occasionally introduce fixed expressions or adverbial collocations belonging to general language, such as à grande échelle, à fort indice, en valeur absolue; such expressions had to be discarded.

These prepositions à and en proved to be good indicators of properties, as witnessed by the number of terminological units formed with such recurrent semi-fixed expressions linking with keywords. To give just a few: société à responsabilité limitée, produit à forte rotation, produit à prix imposé, magasin en libre service, magasin à prix réduits, magasin à assortiment limité, publicité en porte-à-porte, publicité à frais partagés, vente en gros, vente au détail, vente aux enchères, présentation en vrac, étiquette à affichage électronique, etc. In each of these complex terms, the second element is considered a property of the entity it qualifies.

3.3.2.2. Adjective / noun caractéristique

Using the marker caractéristique (noun or adjective) proved very reliable. However, the noun propriété did not give any result. It just did not occur.

3.3.2.3. Verbs whose meaning carries the idea of PROPERTY

Verbal markers gave variable results. They are reliable if the verb is semantically close to the concept of property, as is the case with: se distinguer par, se définir par, se caractériser par, être déterminé par, être assorti de.

On the contrary, a large variety of verbs that were chosen because they were included in the manual extraction of the relation, gave unreliable results: proposer, pratiquer, offrir, permettre, créer, occuper, détenir.

In our balance sheet, we note that 54 property relations (a third of the total number) could not be captured by the above markers because of the complexity and irregularity of this relation. Consequently, we tried another approach in addition to the semi-automatic retrieval with lexical markers. The previous listings of agreed-upon definitory features proved valuable because of the recurrence of key concepts.
3.3.3. Defining the prototypical properties of core concepts in retailing

We identified the prototypical properties of all important concepts on the basis of our reading in the field, relying on sentences such as:


“L’assortiment se décrit selon deux axes. La largeur fait référence au nombre de familles ou catégories de produits, La longueur est définie [...]. De plus, la longueur de l’assortiment [...]” (Gaulin, 1993: 12)

We thus obtained lists of properties:

The concept POINT OF SALE (POS) (with all its synonyms and specifics) has the following prototypical properties: ASSORTMENT, SERVICE, PULLING POWER, STAFF, LOCATION and PRICE POLICY.

The concept PRODUCT (with all its synonyms and specifics) has the following prototypical properties: PRICE, BRAND, LIFE CYCLE, PRODUCT DIFFERENTIATION, MARKET SHARE, etc.

Because of the endless variability of sentences containing definitory information, due to nuances and different points of view the authors have to express, a systematic search of properties on the basis of pre-established lists proved reliable. Moreover, the inheritance of the property features helped replication in all synonyms and hyponyms.

Conclusion

We have extracted from the *Dictionnaire analytique de la distribution / Analytical Dictionary of Retailing* all the classes of lexico-semantic relations (LSRs) that seemed significant in the field; 28 of these were identified and named. We then used linguistic markers to look for regularities of such relations. However, the reliability of the lexical markers has been variable, which can be explained by the complexity of relations and the role of context. Even simple hierarchical relations such as generic-specific are not always universally agreed upon; moreover, there is no universal agreement on the classification of entities and events, as mentioned above in the case of GRANDE SURFACE (mass merchandiser).

Associative (circumstantial) relations such as property, goal, object, medium, use, etc. are even more difficult to ascertain. For example, a sentence may point to a goal relation between two terms and another sentence could indicate an application relation or a use relation between the same two terms. The search for typical definitory information was performed with better results for such relations, as demonstrated in the case of the property relation.

The research presented in this paper proves important for two main, general reasons: 1) identifying classes of relations is part of the knowledge acquisition and
organisation process; and 2) the LSR model could serve as a guide for terminology students in other fields as well. Our work supports the hypothesis that it is possible to build rules for the (semi-)automatic extraction of relations in various texts in a domain. This is in line with projects on knowledge organization (field ontologies) that assume that texts (partially) reflect the conceptual organization of the field, even if we assume that concepts are, happily, variable. They evolve as knowledge evolves, and can be presented in a variety of perspectives and individual styles.

Where terminological research aims to provide a tool for learners to acquire new knowledge in a specialized field, organized lists of semantic relations are useful constructs not only for defining concepts in extension, but also for situating them in a lexical field in which categories are related to each other. As representations of human (expert) knowledge, they impose an order on the typical information linked to concepts.

V. References


INVENTORY 1, STOCK
STOCK nm

Définition : Ensemble des marchandises destinées à la vente, dans le magasin ou à la réserve (stockroom, storeroom), dont dispose un commerçant.

Précisions sémantiques : Comme les stocks représentent une partie essentielle de l’actif (assets) d’une entreprise de distribution, il est capital qu’ils soient à leur niveau optimal. Aussi le détaillant doit-il en connaître précisément la valeur et contrôler efficacement les entrées et sorties des marchandises, en en dressant l’inventaire (INVENTORY 2).

Relations internotionnelles : On appelle stock de sécurité (safety stock) la quantité de marchandises en stock (in stock) qui sert de tampon en cas de forte hausse de la demande (demand) ou de décalage d’approvisionnement plus long que la normale. Il équivaut plus ou moins au total des ventes prévues pendant le délai d’approvisionnement (replenishment lead time), ou délai de livraison.

Compléments d’information : Un des principes de base de la gestion des stocks (inventory management) est la détermination de la quantité de marchandises à stocker (to stock), ainsi que la périodicité du réapprovisionnement (REPLENISHMENT). Il faut être en mesure de répondre en permanence à la demande et d’éviter les ruptures de stock (stockouts, stock-outs), tout en réduisant au minimum les frais d’entreposage (storage costs) des marchandises.

La comptabilité des stocks (inventory accounting) a pour objet la valorisation des stocks (inventory valuation), c’est-à-dire le calcul de leur valeur. Celle-ci joue un rôle déterminant dans le calcul des bénéfices bruts (gross margins) et influence les décisions qui sont prises en matière de gestion des stocks.

Comme le prix des marchandises fluctue dans le temps et qu’il n’est pas toujours facile de déterminer leur ordre d’écoulement, deux méthodes ont été adoptées pour attribuer un prix à la marchandise en stock. La méthode du premier entré, premier sorti (PEPS), aussi appelée méthode de l’épuisement successif (first-in-first-out method, FIFO method), se base sur le principe que les premiers produits achetés seront les premiers vendus. Au contraire, dans la méthode du dernier entré, premier sorti (LIFO), ou méthode de l’épuisement à rebours (last-in-first-out method, LIFO method), les produits achetés les plus récemment sont vendus en premier. On recourt essentiellement à cette méthode en période d’inflation afin de minimiser la valeur des stocks, ce qui présente des avantages fiscaux.

Informations linguistiques : On évitera de confondre INVENTORY 1 et INVENTORY 2 (inventaire), qui signifie dénombrement des stocks. L’anglicisme *inventaire au sens de stock est à proscrire. […]

Autres équivalents :
– être en rupture de stock : to be out-of-stock
– surstockage : overstocking

Contextes :
Carrying too much inventory results in higher-than-necessary inventory carrying costs and stock obsolescence. Carrying too little may result in stock-outs, costly emergency shipments or production, and customer dissatisfaction. (Kotler et Armstrong 1996 :414)

[…] on peut définir le stock comme l’ensemble de la marchandise conservée dans les réserves et dans le magasin, en attente d’être vendue, que les produits résultent d’invendus précédents ou qu’ils viennent d’être achetés pour satisfaire la clientèle. (Jallais et al. 1987 : 277)
Appendix 2: Web page of the article INVENTORY

INVENTORY (1)

Terme(s) anglais : INVENTORY 1, STOCK

Terme(s) français : STOCK, nm

Définition française :
Ensemble des marchandises destinées à la vente, qu'elles soient dans le magasin ou à la réserve (stockroom, storeroom), dont dispose un commerçant.

Définition anglaise :
All merchandise that a merchant has for sale, whether in the store or in the stockroom.

Contextes de INVENTORY (1)

Précisions sémantiques Relations internotionnelles

Compléments d'information Informations linguistiques

Mot(s) relié(s) :

<table>
<thead>
<tr>
<th>Relation sémantique</th>
<th>Français</th>
<th>Anglais</th>
<th>Phrase source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loc - Lieu typique</td>
<td>réserve (1)</td>
<td>stockroom, storeroom</td>
<td>Source</td>
</tr>
<tr>
<td>Mes - Mesure</td>
<td>inventaire (1)</td>
<td>INVENTORY 2</td>
<td>Source</td>
</tr>
<tr>
<td>Spec - Type de stock de sécurité (1)</td>
<td>stock de sécurité (1)</td>
<td>safety stock</td>
<td>Source</td>
</tr>
<tr>
<td>V0 - Verbe ou nominalisation</td>
<td>stocker (1)</td>
<td>to stock</td>
<td>Source</td>
</tr>
</tbody>
</table>
Appendix 3: List of the 28 classes of lexico-semantic relations (LSRs) and criteria for classification

### Paradigmatic relations

<table>
<thead>
<tr>
<th>LSR</th>
<th>Example</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag</td>
<td>Ag(enchère) = enchérisseur</td>
<td>the agent, the one who does, is responsible</td>
</tr>
<tr>
<td></td>
<td>Ag(marché aux puces) = pucier</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ag(franchisage) = franchiseur</td>
<td></td>
</tr>
<tr>
<td>But</td>
<td>But (locomotive) = flux de clientèle</td>
<td>the aim</td>
</tr>
<tr>
<td>Caus</td>
<td>Caus (commande en souffrance) = rupture de stock</td>
<td>causative factor</td>
</tr>
<tr>
<td>Contrast</td>
<td>Contr (bien de consommation) = bien de production</td>
<td>contrastive or antonym</td>
</tr>
<tr>
<td>Fonct</td>
<td>Fonct (chef de rayon) = rayon</td>
<td>functions or responsibilities of someone</td>
</tr>
<tr>
<td>Gener</td>
<td>Gener(durable good) = good</td>
<td>noun for generic</td>
</tr>
<tr>
<td></td>
<td>Gener(even price) = price</td>
<td></td>
</tr>
<tr>
<td>Instr</td>
<td>Instr (saisie électronique de la signature) = stylet</td>
<td>instrument; object of product that makes something feasible</td>
</tr>
<tr>
<td>Loc</td>
<td>Loc (enchères) = salle de vente</td>
<td>typical place</td>
</tr>
<tr>
<td>Med</td>
<td>Med (mise de côté) = acompte</td>
<td>medium, means</td>
</tr>
<tr>
<td>Mes</td>
<td>Mes (frontale) = unité de vente</td>
<td>Measure</td>
</tr>
<tr>
<td>Mod</td>
<td>Mod(bien d’achat courant) = échelle d’Aspinwall</td>
<td>theoretical model</td>
</tr>
<tr>
<td>Mult</td>
<td>Mult(client) = clientèle</td>
<td>collective (quantifier)</td>
</tr>
<tr>
<td></td>
<td>Mult(article) = assortment</td>
<td></td>
</tr>
<tr>
<td>Obj</td>
<td>Obj (EDI) = bon de commande, accusé de réception</td>
<td>the object aimed at</td>
</tr>
<tr>
<td>Part</td>
<td>Part (société mère) = succursale</td>
<td>stage in a process</td>
</tr>
<tr>
<td>Phase</td>
<td>Phase (processus d’adoption) = essai</td>
<td>stage in a process</td>
</tr>
<tr>
<td>Prop</td>
<td>Prop (magasin minimarge) = politique de prix réduits</td>
<td>intrinsic property</td>
</tr>
<tr>
<td>Recip</td>
<td>Recip (publipostage) = client potentiel</td>
<td>recipient</td>
</tr>
<tr>
<td>Result</td>
<td>Result (vol à l’étalage) = perte, écart d’inventaire</td>
<td>noun for result</td>
</tr>
<tr>
<td>Sing</td>
<td>Sing(clientèle) = client</td>
<td>singulative (quantifier)</td>
</tr>
<tr>
<td>Spec</td>
<td>Spec (réduction) = ristourne</td>
<td>specific</td>
</tr>
<tr>
<td>Strat</td>
<td>Strat (distribution physique) = logistique commerciale</td>
<td>strategy</td>
</tr>
<tr>
<td>Syn</td>
<td>Syn_{mag}(centre de boutiques spécialisées) = centre haut de gamme</td>
<td>variant or close synonym</td>
</tr>
<tr>
<td>Tot</td>
<td>Tot (détailant affilié) = réseau de franchise</td>
<td>global entity</td>
</tr>
<tr>
<td>Util</td>
<td>Util (surmontoir) = publicité sur le lieu de vente</td>
<td>utility</td>
</tr>
</tbody>
</table>

### Syntagmatic relations:

| Adj  | A (concession) = concédé, concédant | adjective |
| Verb | V (code-barre) = saisir, saisie de | verb or nominalisation |
| Vderiv | Vderiv (troc) = troquer | derivative verb or nominalisation |
| Vass | Vass (enchères) = vendre au plus offrant | verb for associated action |
### Appendix 4: Approximate number of relations extracted, by classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj</td>
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<tr>
<td>Ag</td>
<td>126</td>
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<tr>
<td>But</td>
<td>61</td>
</tr>
<tr>
<td>Caus</td>
<td>8</td>
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<tr>
<td>Contr</td>
<td>78</td>
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<tr>
<td>Fonct</td>
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<tr>
<td>Gener</td>
<td>357</td>
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<td>Instr</td>
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<td>Loc</td>
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<td>Med</td>
<td>105</td>
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<tr>
<td>Mes</td>
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</tr>
<tr>
<td>MesPart</td>
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<td>Mod</td>
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<td>Mult</td>
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<tr>
<td>Obj</td>
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<td>Part</td>
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<tr>
<td>Phase</td>
<td>36</td>
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<tr>
<td>Prop</td>
<td>165</td>
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<td>Rec</td>
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<td>Sing</td>
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<tr>
<td>Spec</td>
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<td>Strat</td>
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<td>Synuse</td>
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<td>Tot</td>
<td>39</td>
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<td>Util</td>
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<tr>
<td>Verb</td>
<td>74</td>
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