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GUIDELINES FOR TERMINOLOGY POLICIES

*Formulating and implementing terminology
policy in language communities*

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Prepared by Infoterm

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Executive Summary

These Guidelines address decision makers in different positions at various levels, who - for a variety of purposes - want to design, plan and implement a terminology policy, which is geared towards a conscious, systematic and controlled approach to the creation, maintenance and use of terminology in/for defined user communities.

Terminology planning has come to the fore in various countries in the world at different levels: national, regional, language community, local community, institutional or organizational level. There are also many terminology planning activities in various professional fields such as chemistry, biology, physics, medicine, and the like. In addition, there is a terminology component to virtually all standardization and harmonization activities, whether in industry or elsewhere. Besides, legislation is always replete with terminological definitions, following the time-honoured saying “you cannot regulate what may be not understood”, which means “...what is not defined”.

A terminology policy or strategy, especially when conceived and implemented at the national level, needs to take into account highly complex

- demographic factors;
- cultural, ethno-linguistic and geo-linguistic factors; as well as
- socio-psychological factors;

which can have an impact on the success of the measures taken. These factors may change over time, a point that must also be taken into account in every ethnic and language community that wants to implement terminology planning for whatever purpose.

Terminology planning activities have emerged over recent decades:

- at the national, regional or local levels;
- in intergovernmental organizations (IGOs);
- in international non-governmental organizations (NGOs), and
- in large institutions and organizations (including in multinational enterprises).

They manifest themselves in:

- language communities, e.g. for the sake of developing special purpose languages (SPL);
- individual domains (i.e. subject fields or other kinds of expertise), e.g. to foster research and development; and recently in

- new applications in eBusiness, mobile telephony, eLearning, eHealth, eScience, eGovernment and most of the other so-called “e”-activities.

At a strategic level, the positive potential of systematic terminology planning – and especially of terminology policies - in support of information, knowledge or innovation policies, as well as of educational strategies, etc. has been recognized. With this greater awareness, countries and language communities are increasingly feeling the need to formulate systematic terminology policies (comprising also terminology planning strategies) in order to improve their competitiveness. This trend coincides with the requirement that today’s accelerated globalization needs to be complemented by accelerated localization, i.e. translation and adaptation to comply with local cultural and linguistic norms.

List of Abbreviations

- CSCW – (net-based) computer supported co-operative work
- GPL – general-purpose language
- HLT – human language technology
- ICT – information and communication technology
- IGO – intergovernmental organization
- LP – language planning
- LSP – language for special purposes (see SPL)
- MCC – mobile computing and communication
- NGO – non-governmental organization
- NLP – natural language processing
- NPO – non-profit organization
- SPL – special purpose language or specialized language (LSP)
- STI – scientific-technical information
- TDB – terminology database
- TMS – terminology management system
- UN – United Nations

Preface

There have been many initiatives aimed at drawing attention to the importance of terminology in development. At the regional level the *European Charter for Regional or Minority Languages* (1992), which includes terminology aspects stressing the value of multiculturalism and multilingualism, is an excellent example. The charter recognizes that the protection and encouragement of minority languages is quite compatible with maintaining the status of official languages.

Around the year 2000, UNESCO intensified its activities to create better awareness of the important role of language in bridging the digital divide and building knowledge societies. The digital divide almost invariably co-occurs with inequality of access to information and knowledge, which is in turn associated with inequality in linguistic access. Inadequate terminology is one key factor in the inequality of linguistic access, and it results in “functional illiteracy” in the contexts of accessing information and using computers. UNESCO’s intersectional and multidisciplinary programme **Initiative B@bel** recognized the importance of multilingualism and multiculturalism in the age of the Internet, which was also stressed in the *Universal Declaration of Cultural Diversity* (2001).

UNESCO also promoted actions to achieve world-wide access to electronic content (e-content) in all languages, improve the linguistic capabilities of users, and create and develop tools for multilingual access to the Internet. This intention was reinforced by the **Recommendation on the promotion and use of multilingualism and universal access to Cyberspace** (adopted at UNESCO’s General Conference in Paris, October 2003). In the discussions leading up to this standard-setting Recommendation, it was emphasized that language is and remains the primary means of inter-human communication. The Recommendation also covers terminology aspects in conjunction with the development and promotion of multilingual content, domain-specific communication, information and knowledge.

In the process initiated by the “World Summit on the Information Society”, UNESCO persistently emphasized language, and in particular multilingual aspects, as key elements of cultural diversity and universal access to information and knowledge. In this connection terminology development in education, sciences, and culture is key to developing knowledge societies.

Estimates of the number of languages existing today vary, but the average figure lies somewhere between 6,000 and 7,000 (not counting a far larger number of dialects and local variants). An ever-increasing body of empirical evidence indicates that there is a critical relationship between individuals’ opportunity to use their mother tongue in a full range of cultural, scientific and commercial areas, and the socio-economic well-being of their respective language communities. **People whose mother-tongue is not (or not sufficiently) developed from the point of view of terminology and special purpose languages (SPL) or who are denied the use of their mother-tongue in education and training, for accessing information, or interacting in their work places, tend to be disadvantaged.**

Especially smaller language communities (including linguistic minorities of all sorts) have to make more efforts than the surrounding larger language communities in order to prevent marginalization with respect to scientific-technical and economic-industrial development - a factor that ultimately may lead to socio-economic decline. **In most cases limitation in the use of a language to folklore or to the family sphere means that such a language will be inadequate to support professional communication. Similarly, a language that lags behind in its terminology for a given domain risks losing the ability to communicate in that subject in its language over time.** There is, therefore, a need for (continuous) terminology planning in many – or even all – language communities and for concrete legal, financial and administrative action to support these efforts. Implementing a terminology policy for affected language communities is one such action.

These Guidelines aim to provide methodological assistance for formulating and implementing a terminology policy based on consolidated language planning endeavours. They are designed with the goal of being useful for all countries and language communities ranging from developing countries and language communities with less mature terminologies to developed ones that possess highly evolved terminologies, extensive terminological activities and existing markets for terminological products and services.

In countries or regions where two or more language communities co-exist and interact, the terminology policy should reflect this situation. Terminology, too, like language at large, may involve controversial issues, especially if several language communities are affected. In this connection the Universal Declaration of Human Rights (1948), the International Covenant on Civil and Political Rights (1966), the International Covenant on Economic, Social and Cultural Rights (1966) and the Declaration on the Rights of Persons belonging to National, Ethnic, Religious and Linguistic Minorities (resolution 47/135 of 18 December 1992) of the United Nations (UN) can provide significant guidance.

In view of the above and given the fact that terminology is indispensable in the context of information literacy – comprising also functional literacy, media literacy, digital literacy etc. – UNESCO contracted Infoterm to organize a group of experts with the aim of preparing these *Guidelines for Terminology Policies*, which provide a systematic framework for decision makers and policy makers to initiate such a policy in support of the long-term and sustainable development of their country or their language community. The contributors to this publication have different cultural and social backgrounds and have all garnered different experiences concerning the design, planning and implementation of a terminology policy, the essence of which has been compacted into these Guidelines.

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Guidelines for Terminology Policies

Formulating and implementing terminology policy in language communities

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0 Languages Under the Impact of Globalization

Language is the major means of human communication. Human language also plays an increasingly important role in man-machine communication and is becoming more and more involved in machine-machine communication. Language as it has emerged over the last millennia of human development is a highly complex phenomenon. It is, contrary to popular perception, more than just an instrument for the transfer of information. In its cultural dimensions, language is closely linked to the identity of communities as well as of individuals. There is little wonder, then, that people at times become emotional over language issues.

Linguistics distinguishes between general-purpose language (GPL – or everyday language) and special purpose language (SPL – or specialized language). This document – while not ignoring the cultural and emotional dimensions – focuses on SPL as the major means of:

- domain (i.e. subject-field or professional) communication;
- representation of specialized (i.e. subject-field related or domain) knowledge; and
- access to specialized (i.e. subject-field related or domain) information.

In this context, we speak of the “specialized languages” (SPLs) of the various domain communities, which are engaged in a subject-field or other kind of expertise. Members of these communities generally agree on their own linguistic conventions, which do not necessarily conform fully with GPL conventions. Since modern society is strongly under the influence of scientific-technical development, SPLs are increasingly having a strong impact on the development of the respective GPL.

As science and technology are the bases of economic and societal development, the interaction between language and economic activity is, in general terms, quite self-evident. It is increasingly recognized that the “relative strength” of the language of a given language community tends to reflect – after a certain time-lag – the economic performance of that language community. Therefore, SPL today is featured more prominently in language planning debates and in implementations of language planning programmes and policies. However, in view of the overwhelming complexity of language planning covering both GPL and SPL, it is possible and advisable to separate these two aspects. This decision makes it possible to better organize the implementation of programmes and to track performance. National language development programmes then would concentrate on GPL development, and cooperate with the national terminology development programmes with respect to the systematic development of SPL (mainly through terminology planning).

At this stage of consideration, it must be acknowledged that terminology is undeniably the major constituting element of SPL. Terminology plays a crucial role wherever and whenever domain-specific information and knowledge is:

- generated (e.g. in research and development);
- used (e.g. in specialized texts);
- recorded and processed (e.g. in databases);
- passed on (via training and teaching);
- implemented (e.g. in technology and knowledge transfer); or
- translated and interpreted.

As a consequence, terminology planning today has to be seen in the much wider perspective of innovation and of information, knowledge, and even eContent strategies. A language community whose language has not developed scientific and technical terminologies is unavoidably forced to use some other, more developed foreign language for domain communication. As communication in general today is highly supported by information and communication technologies (ICTs), the lack of terminology indirectly, but inevitably, establishes digital divides, which can manifest themselves in different ways.

The development of knowledge societies is accelerated by the development of ICTs, especially by the convergence of telecommunication and computer technology, with the tendency to merge mobile computing and communication (MCC). As ICTs become more pervasive, there is an accentuated need for effective and efficient methods of using them. The cost for ICT hardware and software is gradually declining, while the costs for “content” creation and use are gradually increasing. The latter are more often than not “hidden costs”, which apply not only to individual institutions and organizations, but also to language communities. Here terminologies play a crucial role: terminological data are indispensable elements of domain-specific information and knowledge (covering a large share of content in general). As a consequence, terminology planning, in combination with the systematic development of the related human language technologies (HLTs) can render strategic potentials exponentially more effective.

A country’s relative level of development can be measured by the average capability of its citizens to use information for the sake of knowledge transfer and capacity building. As terminological data constitute the core element of any domain-specific information and knowledge representation, the availability of and accessibility to these data are critical socio-economic factors. These guidelines take cognizance of the experience gained in many language communities and countries with language and terminology planning activities. The guidelines recommend a shift at a certain stage of language planning to a systematically conceived and implemented terminology policy associated with domain communication.

1 Basic Concepts

In this document **communication** is confined to the meaning of inter-human communication comprising (verbal) communication in spoken or written form as well as non-verbal communication. **Domain communication** is used for specialized – i.e. scientific-technical, or professional communication – in a **domain**, which in the pragmatic sense includes scientific-technical subject-fields as well as other fields of expertise. **Technical communication** here is not used in the sense of communication technology, but in the meaning of technical writing or technical documentation, i.e. the preparation of documents written in or largely containing special purpose language text. **Terminology planning** develops language largely according to the needs and requirements of domain communication.

Special purpose language (SPL or specialized language) means the language used by expert communities with a greater or smaller share of terminology and domain-specific linguistic conventions. SPL deviates to varying extents from **general-purpose language** (GPL or everyday language), which means the language used largely for everyday purposes by any language community. There may be all kinds of variations (such as dialects), whose conventions deviate from the so-called **linguistic norm**. The latter comprises a set of language conventions, which is considered to be the shared linguistic standard of a language community. GPLs are the languages of individual language communities, whereas SPLs are the specialized languages used by domain expert communities within a language community.

Increasingly technology is also applied to language: **language engineering** has emerged as a subject field geared towards **natural language processing** (NLP). The technologies derived from language engineering are called **human language technologies** (HLTs), which apply the knowledge of language to the development of computer systems that can recognize, understand, interpret and generate human language in all forms; in other words, the development of applications that make it possible for human beings to interact directly with computers.

Terminology science is the subject field that investigates the structure, formation, development, usage and management of the **terminologies** in various subject fields, and that prepares the methodological foundation for many applications. **Terminological tools** – mostly terminology application software – are used for handling terminological data in some way or other for different purposes. **Terminology management systems** (TMSs), for instance, are designed as tools to record, store, process and output terminological data according to recognized professional principles. A national **terminology database** (TDB) can contain monolingual or multilingual terminological data and be established at country, language community or local levels depending on the needs of the respective communities. In terminology planning and in particular in the framework of a national terminology policy, a national terminology database often is used as one of the primary tools for the implementation of that policy. The creation of centralized TDBs is also an effective strategy for companies and other organizations or institutions, although the maintenance of large TDBs is increasingly being replaced by networks of distributed and federated terminology databases.

Terminological activities can result in a variety of **terminology products**, such as terminology standards, SPL dictionaries, glossaries, terminology databases, etc. Terminology products and **terminology services**, such as terminology consultancy and training services, terminology information and documentation, outsourcing of terminological tasks, information services, etc., are usually used as tools for the implementation of a national terminology policy. In language communities with highly developed terminological activities, terminology products and services serve the **terminology market** constituted by users and the providers of terminological products and services.

A **national terminology policy** is a public strategy formulated at the level of political decision making in a country or in a more or less autonomous language community (within a country or a region that spreads across the borders of two or more countries) with the aim of developing or regulating emerging and existing terminologies for an array of purposes. Experience shows that different user groups need terminological data having different degrees of complexity and detail for different purposes. It is therefore highly economical to prepare multi-purpose terminological data from the outset for different users and applications. It is likewise advisable to conceive the national terminology policy as multilingual and non-exclusive from the outset. The above also applies to terminology policies or strategies in the private sector, such as in enterprises, NGOs, professional associations etc.

2 Language Planning and Terminology Planning

This chapter contrasts language and terminology planning, which today actually have become complementary activities. Both activities reflect many criteria, including the political context and the historical genesis of language use, the socio-economic situation, geo-linguistic aspects, and demographic, cultural and psychological factors, all of which play a role when analyzing societal stake-holders (including institutions) and their relations to each other.

2.1 Language Planning

As the focus of these Guidelines is on terminology planning, only a short introduction to the theory of language planning (LP) is given here. Special emphasis is placed on demonstrating the position of terminology within the framework of language and communication. Broader issues in language planning are treated in several UNESCO publications.

2.1.1 Overview of language planning theory

The question may arise as to the need for, or even possibility of, language planning. Gadelii (1999) justifies language planning in the following way:

“Society is developing and language has to adjust to reality. Political decisions are taken and this may mean that new communities are created which may lack a common means of communication. In cases such as these, language planning is desirable and indeed necessary”.

The history of science provides evidence of many examples of more or less successful intervention of the natural development of language. As long as this intervention concerns existing, natural language, we speak of “language planning”. What we today know as LP was in the past severally referred to as glottopolitics, language engineering, language regulation or language development. After comparing 12 definitions, Cooper (1989) came up with his own definition:

“Language planning refers to deliberate efforts to influence the behaviour of others with respect to the acquisition, structure, or functional allocation of their language codes”.

Cooper himself says that he deliberately chose a very broad definition so as to avoid any restrictions with respect to governmental activities, special target groups or any special methodology.

Language planning today entails much more than simply coining words and terms and thinking up spelling reforms. It involves an ecological approach to language as a crucial element in human societies, and it includes multiple socio-linguistic factors. Language planning covers a mixture of methods and approaches, including terminology and lexicography, terminology management, translation and translation management, and

increasingly, corpus-based approaches (term extraction, corpus analysis for spotting neologisms coined in discourse communities, etc.). Here, too, the use of human language technologies (HTLs) is increasing.

The term **communication planning** has been proposed to subsume language planning and any other planning activity connected with inter-human communication, whether such an activity is language focused in the strict sense or is more broadly organizational, technical and infrastructural. Figure 1 below illustrates communication planning as the super-ordinate term for language planning and terminology planning.

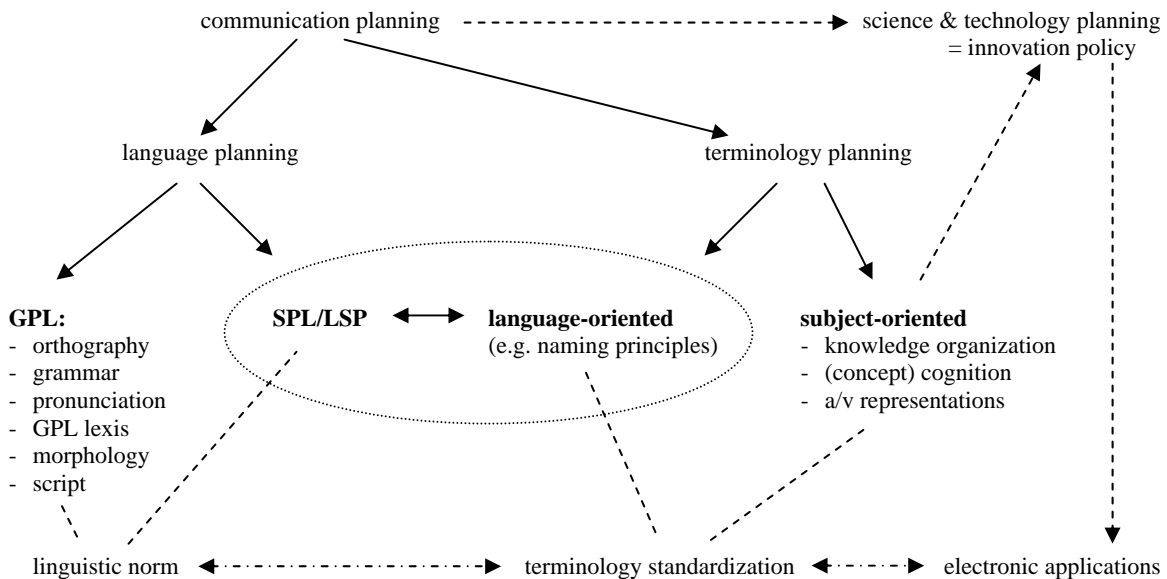


Figure 1: Overview of some communication planning concepts

Figure 1 also shows an overview of the relations among these concepts. The listing under “GPL” indicates elements that are part of the classic definition of corpus planning. Corpus planning includes activities such as the design or reform of an orthography (including the standardization of spelling), the choice of script, the determination of word pronunciation, vocabulary and terminology expansion, changes in the grammatical system, dialect levelling, production of readers and manuals in order to promote literacy, the development of dictionaries, grammars, and simplified glossaries for SPL, the creation of fine literature and support for the creative arts, as well as the creation of institutions for treating language questions. But language planning also includes aspects of status planning, i.e. allocation of language to different domains of society (business, education, the courts, administration, media, etc.).

2.1.2 Need for language planning

The need for language planning and a language planning policy may arise from various conditions:

- **Multilingualism:** only few countries like Iceland may claim to be essentially monolingual, while multilingualism is the norm for the majority of countries world-wide. In order to respect human rights effectively, even officially monolingual countries have to accommodate and address other language groups that have minority status within national boundaries. Many countries, which decide to proclaim one or more languages as the official medium of communication, are involved in systematic language planning. However, constitutions often fail to mention explicitly which languages they recognize. In addition to officially recognized languages, other languages may be used in education or other sectors depending on local needs.
- **Education:** the benefits of initial mother-tongue education, acknowledged by UNESCO as far back as the 1950s, are still being denied millions of children around the world because foreign languages are used in early schooling. Often, failure to use the mother tongue as a medium of instruction results in high rates of dropping out of school and illiteracy.
- **Communication Technologies:** increasingly, as mentioned above, there is a need to bridge the digital divide between developed and developing countries. Language planning includes the decision on and development of languages for use in electronic media, for instance through the use of Human Language Technologies (HLTs).

In addition to these factors, language (especially in a multilingual society) is like natural resources and is thus crucial for a nation's economic well-being and the wealth of its peoples. Language should, therefore, be treated as an integral element in the social, economic and cultural development plan of a country. Like other resources, language, too, has – if handled properly – a job-creating power.

2.1.3 Objectives of language planning

Some of the most important objectives and goals of language planning include:

- checking the high failure and drop-out rate of school children in multilingual environments and improving access to formal education by facilitating the implementation of mother-tongue education as well as education in the mother-tongue, especially at pre-school and primary school levels;
- creating an optimum learning environment by ensuring that mathematics and the sciences can be taught in the language the learner understands;

- improving the qualification of officials, employees, scientists, researchers, teachers and even skilled workers, which comprises an investment in the economic power of the nation;
- enhancing cultural diversity and individuality in the country by fostering the arts in the different languages;
- preventing ethnic and political dissatisfaction on the part of the people by creating an environment based on the principle of language equality, i.e. the equal treatment of all languages in a country, especially in official sectors of society such as legislation, justice, public administration and education, bearing in mind the different developmental stages of co-existing languages;
- ensuring democracy by empowering the people to be informed and make their own political choices;
- bridging the digital divide by developing languages for use in electronic media and thus fostering development of HLTs, machine translation, etc.;
- providing members of the language community with lexicons, manuals, works of creative art, school books, newspapers etc. in their primary language.

2.2 Terminology Planning

In contrast to language planning, which may start at a level of language development where no written language exists and where no actual linguistic norms exist yet, terminology planning relies on the existence of linguistic norms and a certain grammatical and orthographical stability in the written language. On this basis, terminology planning consciously and systematically develops special language according to the needs and requirements of domain communication, where a vast number of new technical terms are created every day in hundreds of languages all over the world. These terms form terminologies, which comprise sets of terms with their specialized meanings (concepts) used in particular SPLs of specific domains. On the one hand, terminology development is a natural, unavoidable phenomenon, but on the other hand it can be a goal-driven initiative as part of language development AND at the same time a tool for realizing socio-economic transformation policies.

As a means of understanding what terminology is about, consider the following dictionary explanation of chlorofluorocarbons (CFCs), discussed in a recent book on language planning (ANTIA 2000):

“CFCs are non-flammable, non-toxic, and unreactive synthetic compounds which have been used since the 1930s as working fluids in refrigerators and propellants for aerosol sprays. They have now been shown to be harmful to the earth’s ozone layer, as well as being major contributors to the greenhouse effect [...]. CFC molecules which have been released into the environment are broken down by the sun’s

ultraviolet radiation in the upper atmosphere, forming chlorine which reacts with ozone.”

Let us assume that the above quote is an amalgam of two derived text variants: the first is made up only of the **GPL text elements (words)** in the default **black font colour** (as can be seen in the example above), and the second is made up only of the **SPL text elements (terms)**, which appear in **grey font colour**. While the black text elements viewed all by themselves will not make sense to anybody, the grey text elements (by virtue of semantic relationships coupled with some sort of intuited English grammar) would make sense to most people with an interest in environmental chemistry. The explanation for this phenomenon lies in the function of the terms: they encode the substance of domain knowledge. The GPL elements in the quotation simply serve as the grammatical and syntactical mortar that cements these critical building blocks into a coherent, cohesive whole.

Besides being central to the process of understanding, terms (and the concepts to which they refer) are also indispensable for a variety of purposes (exemplified in the above citation), such as:

- Translation: what is chlorofluorocarbon in your language?
- Information retrieval: how can we search for certain information items, e.g. for similar texts in the Internet using a search engine?
- Documentation: how can documents be arranged in an office archive in such a way that it can be found and re-used again even after years?
- Communication: how do I, in my capacity as student, teacher, environmental expert, etc. to a legislator or citizen, receive or transmit the information and knowledge in the above text?
- Education: how can highly professional subjects be taught to pupils, students, apprentices, experts etc.?

Thus terminology planning may be geared to many applications, and carried out in contexts where most of the other strands of terminological activity are also taking place or are required. Consequently, the need for a systematic approach and for coordination cannot be overemphasized.

2.2.1 Term formation methods in terminology planning

Terms may consist of simple words or of complex phrases (i.e. multiword terms) with specific morpho-syntactic and morpho-semantic features that may at times be unknown in general language but that can be specific to certain domains. Furthermore, we have to distinguish between different types of designations, not just terms (not to mention term elements). Besides, it is always difficult to distinguish words from terms, terms from non-terms, or names from terms. Term formation depends on the functional role of

designations in domain communication. In corpus analysis, term extraction and term identification are difficult processes. Despite intensive research, no absolutely reliable theoretical models and corresponding algorithms have been developed so far. Nevertheless HLT methods and tools do exist that yield satisfactory results for term identification and extraction from corpora, approaches that should be used whenever appropriate (being aware of their inherent limitations).

The interaction between domain languages and general language is very dynamic. There is a constant flux of lexical material in both directions:

- De-terminologization: specialized terms are incorporated into general language as widely known words;
- Terminologization: common words become (part of) terms;
- Current term formation principles: the following semiotic principles are basically applicable to 'all' languages. These principles focus on the systematic nature of terminologies with their underlying conceptual networks, including the cognitive dimension, aspects of knowledge representation, etc.):
 - transparency (vs. opacity);
 - consistency;
 - appropriateness;
 - conciseness (linguistic economy);
 - derivability;
 - linguistic correctness;
 - preference for native language (except in domains or languages where other traditions exist, for instance the use of Latin or Greek forms in some disciplines).
- Term-formation methods:
 - creating new forms:
 - derivation;
 - compounding;
 - abbreviated forms;
 - using existing forms:
 - conversion (change in part-of-speech, sometimes called recategorization);
 - terminologization (assigning new, frequently analogous or metaphoric meanings, to existing terms in more or less related fields or GPL words);
 - Semantic Transfer within a special language;
 - trans-disciplinary borrowing (metaphors);
 - translingual borrowing:
 - direct loan;
 - loan translation.

The above-mentioned methods have to be assessed for their applicability in each language. Semiotic principles serve as guidelines on how to apply term-formation methods. Some of the principles contradict each other, resulting in crucial trade-offs in each particular case (e.g. transparency vs. conciseness of terms). This and more details can be found in ISO 704 and other pertinent International Standards (see References).

Current problems and challenges in term formation also include discrepancies with respect to general linguistic models in morphology, diversity and inconsistency of rules in different domains (in particular for natural sciences with specific nomenclatures), lack of detail in the description of many languages, and the need for full codification of these languages (e.g. through language planning) in order to have reliable rules for terminology development, in particular concerning orthography, spelling, pronunciation, and grammar. For HLT applications, there is a need for automated models for term creation in the languages to be processed.

2.2.2 Descriptive and prescriptive terminology work

New terms are regularly introduced into a language either to fill a gap, which is created by the introduction of a new concept, or to replace an existing, less efficient term. There are two approaches dealing with this evolution of terminology: descriptive and prescriptive terminology work. While descriptive terminology work only observes and analyses the emergence of terms, prescriptive terminology work constitutes an agreement by users to adopt a term for common and repeated use in given circumstances. The latter comprises terminology unification, standardization and harmonization. The motivation for standardizing terminology can have all sorts of commercial reasons or be the result of security and safety considerations.

Terminology standardization almost always involves a choice among competing terms. There are several factors that can influence this choice, e.g. economic reasons (a term might be chosen because it is less cumbersome than others), precision (one term might have greater clarity or transparency than others), appropriateness (a term may have disturbing or political connotations associated with it).

Terminology standardization covers two distinct aspects, reflecting two different infrastructures. The standardization of terminological principles and methods takes place within the framework of horizontal infrastructures in that it cuts across virtually all domains. In contrast, the standardization of terminologies in the various domains (i.e. terminology work that today is done primarily within technical committees) reflects vertical infrastructures. Needless to say, the standardization of terminologies should be based on standardized principles and methods, which themselves should be based on scientific theory. At the international level, the technical committee ISO/TC 37 “Terminology and language and content resources” takes care of the standardization of principles and methods of terminology work.

2.2.3 Terminology management

As stated earlier, terminology science is a highly interdisciplinary field. Terminology practice, therefore, necessitates the cooperation of experts from several domains. Due to the sheer volume of terminological data, as many people as possible should work together and share efforts and resources:

- Terminography vs. lexicography: according to classic definitions, terminography is concept-based and lexicography is word-based. In reality there is no clear distinction; hybrid methods abound leading to slight differences in workflow and, more importantly, in anomalies with respect to data structures. A convergence of methods with respect to word/meaning orientation vs. term/concept orientation can be observed, and efforts are underway to facilitate interoperability between heterogeneous systems.
- Descriptive vs. prescriptive modes of work: the initial stages of terminology management generally involve documenting diversity within and across cultural, linguistic, disciplinary, professional, and corporate boundaries; during a second stage, it is frequently necessary to reduce this complexity for specific purposes by standardizing terminology, or by harmonizing terminology in cases of lexical fragmentation at the same level of social register.

Terminography is the process of documenting terminological information. This work is carried out on monolingual, bilingual and multilingual levels. Purpose and application-driven principles determine the design of technical dictionaries, glossaries and other terminographical products conceived for different target audiences (e.g. in education, for mass media, etc.). Concerning ‘meaning’ and terminography, the most important considerations include:

- Concepts and conceptual structures: concepts are mental constructs (cognitive units). In domain knowledge, conceptual structures are the basis for any given terminology. From a linguistic point of view, the meaning of a term is the concept designated by this term. Concepts are formed and constantly changed in any professional activity and in all forms of professional communication. Concept formation is also driven by cultural conventions, and language is the main manifestation of culture. The complex and dynamic interaction between term formation and concept formation needs to be taken into account at all stages of terminology development and terminography.
- Definitions, contexts, examples: while we distinguish among different kinds of definitions – intensional, extensional, partitive, functional, operational, etc. – in systematic terminology work, a concept system is reflected by interrelated definitions. Multi-dimensional concept systems require definitions that map the different facets or distinctive criteria. Therefore, principles of writing and/or evaluating/revising definitions have to be formulated (see ISO 704, Wright/Budin 1997: “Dos and Don’ts of definition writing”).

- Contexts (comprising also definitional and illustrative contexts): contexts in the environment of terminology management illustrate the function of a term in discourse, i.e., they are chunks of text. Documenting different functions of contexts is very useful and when there is no time for extensive definition writing, documenting contexts provides a useful alternative, in particular when corpus analysis is used to create large corpora in a short time. Contexts support definitions and in some cases they may be the only information available (in the absence of definitions). They are valuable even in the presence of definitions because they demonstrate that the definition is the correct one for a given instance. In any case, they can be considered an authentic source for analyzing the usage of terms as well as their collocations.

Comparative terminology work and cooperative terminology work comprise two basic approaches to terminology management:

- Comparative terminology work involves the examination of terms and concepts used in different languages in order to arrive at the so-called “equivalent” terms to be recommended in a terminology resource or standard. This process frequently reveals discontinuities in conceptual structures and terminological usage between language communities. In examining the problematic issue of “equivalence” within a pragmatic (as opposed to a philosophical) context, a functional approach is useful. Textual and communicative equivalence vs. terminological or lexical equivalence needs to be examined. Comparative terminology analysis at this stage requires thoroughly documenting this research and committee discussions for all languages concerned, thus building a unique knowledge base and a decision-support system.
- In collaborative terminology work, best results are achieved – especially for language development and terminology standardization – when linguists, terminologists, and domain experts work together in committees. Typically, these different experts have different knowledge and experience to contribute to a complex task:
 - domain knowledge (conceptual knowledge);
 - linguistic knowledge (generic and language-specific knowledge);
 - terminological knowledge (knowledge about work methods, that bridge the gap between the above two types of knowledge).

3 Formulating and Implementing a Terminology Policy

The methodology outlined in the guidelines emphasizes the need for the systematic design, formulation, implementation, operation, promotion and maintenance of a terminology policy with clear objectives and perspectives as well as application areas and targets. In this connection the use of information networks in support of such a terminology policy must be duly considered as well as the fact that information networks are rendered more efficient if supported by a terminology policy. The establishment of organizational and technical infrastructures in connection with a terminology policy is primarily a means to achieve its objectives and perspectives in connection with concrete general or specific application areas and targets.

3.1 Formulating a Terminology Policy

While focusing on terminology development, the main thrust of formulating a terminology policy can be geared towards the development of:

- its affiliated general language as a means of domain communication in general;
- the SPLs of certain subject fields in a given language, or
- a combination of both these aspects.

This approach, however, can be strongly influenced by the linguistic situation in which it has to be applied. There are an abundance of different situations that may have to be taken into account in formulating terminology policies according to these guidelines.

Within the same language community, terminology development may be necessary in certain SPLs, while several existing and, therefore, competing terminologies in other SPLs would need harmonization. Some language communities are isolated in a defined geographic area inside a country. They may co-exist with other language communities, or constitute more or less autonomous language minorities. Other communities extend across the existing national borders of two or more countries – possibly having different status in different regions - or be scattered across many countries. In some cases, minority languages exist in one or more countries and are cut off from the development of the majority language in their country of origin. In such cases, minority language communities sometimes enjoy an autonomous or semi-autonomous status within their host country and therefore develop special terminological peculiarities in order to adjust to and peacefully co-exist with the majority language community or communities around them. In other cases, such minorities more or less completely depend on the language development in their country of origin.

These Guidelines address readers with different linguistic backgrounds – from large countries attempting to establish a national terminology policy, to small and medium-sized countries with one or more language communities, to smallest language communities and other kinds of communities needing a terminology policy. Each

language community may have different needs with respect to institution building and human capacity building as part of the design, formulation and implementation of a terminology policy according to the particular culture, society and other circumstances involved.

3.2 Implementing a Terminology Policy

Policy makers are at present facing the formidable challenge of devising new ways and means of providing and exploiting information resources in their development plans. In response, more often than not, a terminology policy should be conceived in support of, or even be embedded in, other national policies, such as information or knowledge policy, education policy, capacity and institution building policy, technology and innovation policy, etc.

A terminology policy impacts virtually all professional life, education and training, the health system, etc., thus affecting everybody, young or old, who needs to understand or acquire specialized knowledge of some kind or other. In most cases it will be wise to ensure the active participation of those institutions that are most dedicated in their commitment to language planning policies. Last but not least, it is also advisable to engage the whole language community in this process.

These Guidelines largely follow the implementation model for national information policies outlined in UNESCO publication PGI-90/WS/11:

Montviloff, Victor. *National Information Policies*. A handbook on the formulation, approval, implementation and operation of a national policy on information. Paris: UNESCO, 1990.

However, as the Guidelines will often be used at regional or local levels for one or a few language communities, the model had to be simplified. In case of large-scale application at the national level for several language communities, the above-mentioned publication should be considered in combination with these Guidelines.

3.3 Human Capacity Building

Institution and capacity building are important issues in any terminology policy. The need for terminology infrastructures may arise already at an early stage of designing terminology planning programmes. Especially then, terminologists and in particular terminology policy experts are required in order to avoid some of the pitfalls in the implementation of a terminology policy. Similarly, a systematic action plan for human capacity building should be in place to facilitate the training of the terminology experts needed to carry out all aspects of the formulated terminology policy and to pursue any other terminological activities identified as essential in this connection.

As the terminology of each subject field or domain increases with each new invention, information is distributed and knowledge is acquired by means of terminology. The

provision of appropriate scientific, technical, educational and economic terms should be supported by special interest groups and experts throughout the whole language community. In smaller countries or language communities with developing terminologies, the priority during the first stage in implementing a terminology policy should be the preparation of the basic terms that are needed most urgently. This may involve terms needed for the education system, but could also include hygiene or public health or the public transport system etc. So priorities may have to be set for the domain or domains in which to apply the terminology policy first.

In terminology creation processes, technical translators often play a crucial role, since in the translation process they often propose new terms in the target language on the basis of new terms arising in source languages. In all cases the process of terminology creation and adoption requires close collaboration among terminologists, subject specialists, linguists, translators, and educators. Coordinated efforts can be designed to avoid the evolution of conflicting term choices. The use of minority, marginalized, and developing languages within a country provides a means for appreciating and integrating indigenous technologies with modern technology; thus support for language development also encourages the preservation of the cultural heritage and diversity of the country.

If plans involve the creation of terminology institutions, there may be the need to train employees who specialize in terminology project management, terminology work and terminography. On the one hand, terminographers, who are able to extract terms, to document them according to specific terminographic principles and practice and to compile draft term lists, may need to work in close collaboration with domain specialists. Terminologists on the other hand will have to do research into secondary term creation principles and practice. Of course all terminology experts should have a thorough knowledge of the orthography, spelling and word-formation principles of the language(s) in question.

Contributions from the private sector should not be underestimated in this connection. Experts realize that they have to communicate with other domain specialists and with laypersons. But, first of all, they have to communicate in their own domain by means of unambiguous terminology. Such domain specialists then may decide to embark on terminology projects and the compilation of technical dictionaries in their various subject fields. Often these people are not terminologists or terminographers and need assistance in the terminological process of creating terms, documenting them in a systematic way and finally compiling a terminology data collection for their respective subject fields.

3.4 The Role of National Terminology Institutions

The role of institutions providing terminology services is to advise and support the government in the formulation, development, implementation and maintenance of strategies concerning terminology and terminology development. There are cases where one terminology institution provides these services to one or more countries. There are other cases where several terminology services are taken care of by different institutions

at national and regional levels that deliver these services as part of their primary mission. Sometimes domain-specific institutions also render terminology services.

Terminology institutions advise on policy and other matters concerning terminology and specialized languages (SPL). They can establish and evaluate norms for terminographic purposes, for the creation of facilities and for the implementation of standardized procedures for collecting, documenting, systematizing, standardizing and disseminating terminological information for the different language communities in the country. Terminology institutions may also provide an information service on specialized language conventions as well as on terminographic matters. Furthermore, they could coordinate, support and facilitate projects for the development of SPLs, making terminology facilities and products available to related information and communication systems, e.g. by developing and managing a TDB. In the age of networking networks, the latter may take the form of a “virtual” central TDB, which in fact consists of a network of distributed databases.

The objective of national terminology institutions could be to promote the empowerment of all citizens through terminological contributions that facilitate communication at different levels in various subject areas and domains of activity. Other objectives could be to deliver suitable multilingual terminology products in different domains, to coordinate the production of terminologies and external terminological contributions, to forge partnerships with collaborators and stakeholders, to manage a national terminology database (TDB), and maybe to disseminate terminological information to users, clients and collaborators by means of term lists, technical dictionaries, and the electronic media. Apart from facilitating scientific, economic, and technical communication, national terminology institutions can play an important role in knowledge transfer, and consequently in the empowerment of a country’s citizens at large, by enhancing their scientific, economic and technical as well as their general linguistic capacity.

A national terminology institution may need to become a clearing house for terminology work in a given country, since the demand for terminology is increasing by the day. In such a case, it is important to have effective coordination and workflow management for the documentation of terms in order to avoid duplication and eventually to promote standardization. A national terminology institution can act as the national facilitator that documents the terminological input of various speech and subject communities in a central or distributed database. Terminological information can thus be obtained via a central gateway. In this way the national terminology institution can render important services to the whole community.

In countries with one or more language communities spread over large areas, a decentralized terminology infrastructure may be the best solution to the problems of implementing a terminology policy. Decentralized terminology offices can serve as resources for a national terminology institution (e.g. providing users a unified user-friendly access to the federated portals of a number of terminology organizations). They may be situated in areas where the specific domains are prevalent, or they may be placed in the geo-linguistic area where most of the first language speakers of a language that needs terminology development are situated. Terminology projects can also be initiated

by individuals or subject-related organizations and associations that have determined the need for terminology development in a specific domain. Their own language thus may become more functional in the specific region or domain.

3.5 Private Initiatives

Terminology is a strategic resource in a multilingual country. It is the medium through which knowledge and information are disseminated. Through the use of correct, unified or standardized terminology, effective scientific and technical communication skills are developed. In addition new skills and professional profiles are needed on the so-called terminology market, which provides products and services to the users, who may be:

- terminology creators (e.g. researchers, technicians, administrators, etc.),
- terminology data producers (e.g. terminology standardizers, terminology database creators, specialized lexicographers, etc.);
- terminology data distributors (e.g. dictionary publishers, online information services, etc.); and
- any citizen in general.

Terminology products mainly comprise:

- different kinds of terminological information in different forms for different purposes and different user groups;
- terminological tools for various purposes.

Terminological information (if terminology documentation is included) comprises three distinct fundamental types of data, such as (mono- or multilingual):

- terminological data proper (i.e. information on domain-specific concepts and their representation by linguistic and non-linguistic symbols supplemented by a variety of associated data);
- bibliographic data on a variety of different kinds of publications in the field of terminology;
- factual data on institutions, experts, programmes, events and other activities in the field of terminology.

Each of these types of data requires a different type of database system (comprising a set of distinct databases or one integrated database system incorporating several different data models). A terminology information and documentation centre has to deal with all these three main types of database systems modelled for different purposes on the basis of well-defined data categories (according to the “information objects” needed to

document any given data model). The data generated and maintained in such systems as along with the related software can also be used to generate different kinds of “products” and can form a basis for a variety of “services”.

Terminological data from the formal point of view represent specialized knowledge at the level of concepts, and can be offered:

- in conventionally published form (i.e. as hard-copy dictionary, glossary, lexicon etc.);
- as an electronic publication (comprising only the data as such in a given format or in combination with a software or hardware, such as in an electronic dictionary);
- through online information services.

In palm-top computers or even smaller pocket-sized electronic dictionaries the terminological data may be implemented in inseparable combination or integration with the respective software or even hardware.

Terminological data can be acquired by customers on the terminology market for internal use only or for re-use, in the course of terminology data interchange, etc. However, different user groups need terminological data of different degrees of complexity and granularity for different purposes. It is, therefore, highly economical to prepare multi-purpose terminological data for different applications and users, whose needs are addressed by appropriately tailored customer-specific user-interfaces. Terminological data can also be used very efficiently as core information, around which the data of domain-specific encyclopaedias can be organized.

Terminology application software provides the most common kind of tool for handling terminological data in a variety of ways. There are different kinds of **Terminology management systems** (TMS) designed as dedicated tools to record, store, process and output terminological data in a professional manner for different purposes. **Terminology databases** (TDB) consist of terminological data and a TMS to process these data. Sometimes large TDB are integrated in a more or less sophisticated organizational or institutional structure established for the collection and maintenance of large amounts of terminological data for a multitude of users. Most of the PC-based TMS today are applied by individual users, small cooperatives (integrated or not by an appropriate Local Area Network (LAN)), or larger departments (where the individual work-places are usually linked by a more or less sophisticated LAN or intranet).

TMS are increasingly further developed into tools for various applications, such as

- computer-assisted translation;
- scientific and technical authoring (including technical documentation);
- spare-parts administration;

- electronic commerce, etc.

On the other hand TMS modules characterized by varying degrees of sophistication are implemented into all kinds of application software. They are increasingly applied in a variety of information and communication workflows, thus finding new markets in:

- cooperative technical writing (by technical editors);
- documentation (in the sense of information and documentation, as well as archiving and filing); and
- cooperative terminology work.

With computer-assisted cooperative (and network-based distributed) terminology work, the preparation, processing and maintenance of terminological data can be carried out faster, more efficiently and in line with modern quality management.

The following terminology services already exist:

- terminology consultancy and training services;
- outsourcing of terminological tasks;
- information services in the field of terminology.

Consultancy services and training are most often needed in conjunction with application aspects, such as:

- application of terminological principles and methods (including especially the appropriate application of existing standards on terminological principles and methods as well as related standards);
- selection and application of tools (e.g. software for the processing of multilingual data);
- terminology project management etc.

Today's subject field experts frequently have not studied the basic theory of logic and epistemology underlying the philosophy of science or information science, and need training in the theoretical and methodological basics of terminology science and terminography. Large organizations and institutions often need to integrate terminological methods and tools into their information management or quality management schemes. Government agencies and other public authorities in many countries want to implement knowledge transfer policies, which would largely benefit from the appropriate terminology planning methods. Institutions and organizations frequently also need advice with respect to legal problems (especially related to intellectual property rights) concerning the application of terminological data and tools.

Increasingly institutions and organisations of all sorts consider outsourcing a suitable method to cope with identified limited terminological needs. Outsourcing may refer for instance, to:

- research and development on demand concerning new tools or applications;
- adaptation of existing tools etc., such as:
 - TMS or even TDB design and implementation;
 - meta-browsers for information networks, etc.;
- terminology work on demand with respect to:
 - terminology preparation;
 - terminology maintenance (including among others revision and updating);
 - conversion or merging of terminological data;
 - evaluation and validation of terminological data, etc.;
- maintenance and aftercare services with regard to:
 - TMS software maintenance and upgrading;
 - comprehensive data holdings maintenance, etc.

Increasingly terminological products and services – similar to the general situation in the field of information and communication technology (ICT) – are available as or attached to one of many kinds of information services available on the market. They will also increasingly be integrated into other ICT applications.

For the distribution of terminological data to different user groups with various user needs, efforts to establish market-oriented and fee-based information networks for providing:

- terminological data proper; as well as
- value-added terminological products and services

on a commercial basis should not be excluded. Clients would thus have to pay for terminological products and services. However, the more clients can choose among an ever increasing variety of terminological products and services, the more affordable those services will become.

The national terminology infrastructure, whether centralized or decentralized, should therefore fully collaborate with private industry by providing terminological and terminographical assistance and/or training (see 3.1). Experts working at the national level could also assist with the editing and finalization of the end products and with the publishing and marketing of products. The more a terminology policy is conceived as multilingual and non-exclusive from the outset, the bigger potential markets can become.

The planning and implementation of a national terminology policy can be carried out by public institutions or could be delegated to organizations operating in the private sector (either commercial consultancy firms or non-profit NGOs).

4 Preparation, Formulation and Implementation of Terminology Policies

These guidelines promote the formulation and implementation of a policy that is uniquely terminological. Such terminology policies exist for instance in several countries as part of information policies or of policies closely related to governmental and non-governmental information activities. Public and private institutions usually elaborate numerous rules, agreements and guidelines aimed at gathering and protecting information which they need to meet their specific economic, social or political goals. Many of these rules, agreements and guidelines have been successfully implemented and are now accepted as benchmarks for the operation and development of specific activities. However, sometimes their fragmentation creates a chaotic situation, and more often than not they neglect the fundamental role of terminology. With the fast development and convergence of modern ICTs, the issues become even more complex. While these Guidelines concentrate on terminology policies, the integration of these policies into and coordination with other policies must not be neglected.

Based on experience with formulating national information and knowledge policies, the development phases for a terminology policy according to these Guidelines comprise:

- PHASE I – Preparation for the terminology policy;
- PHASE II – Formulation of the terminology policy;
- PHASE III – Implementation of the terminology policy;
- PHASE IV – Sustained operation of the terminology infrastructure and the adaptation mechanism for the terminology policy.

This scheme concentrates on terminology at the country or language community level, but can easily be adapted to other levels or organizational environments.

The importance of strict monitoring and of enforced time schedules for project deliverables increases from PHASE I to PHASE III. Furthermore, the level of public scrutiny may increase towards the implementation phase of the terminology policy. Depending on its scope, the phases and tasks outlined below can be further differentiated. It is particularly important to note that these phases and tasks most probably will not take place sequentially, but instead will overlap and sometimes even be conducted in parallel. As a consequence, careful project planning that enables project managers to control clearly articulated task assignments, deliverables, and deadlines for important project components is essential to the success of the programme. Project management software adapted to the purpose of terminology policy implementation may be of great help in planning and monitoring the conduct of complex processes.

At any point in this work, the study of existing examples and experiences elsewhere in the world may be extremely useful, not the least in order to avoid traps and pitfalls others have already encountered.

4.1 PHASE I – Preparation for the Terminology Policy

Since formulation and implementation of a terminology policy is a highly complex matter, the process should be based on thorough preparation. This preparation phase may cover:

- assessment of the language and terminology environment and of existing legislation;
- activities designed to create language awareness and efforts to obtain official recognition for these activities;
- recommendation of methodology and available or conceivable procedures;
- preparation of preliminary documents;
- organization of a national consultation process.

4.1.1 Assessment of the language and terminology environment

A comprehensive assessment is required of the state-of-the-art of SPL development in the language community, as well as in existing and potential expert communities, of the SPL's impact on or interaction with other policies and strategies, and last but not least, of the attitudes of the language community in general towards language and terminology. This assessment should identify major stakeholders and determine any societal or psychological barriers against a terminology policy. Other tangible and non-tangible aspects as well as other problems to be overcome have to be identified. The assessment should also include an analysis of direct and indirect benefits and of the estimated costs implied in the formulation and implementation of the terminology policy. Furthermore, the goals and scope of the terminology policy as well as options for its realization have to be clearly outlined in order to fully assess the situation so that valid conclusions can be drawn. This process could also take the form of, or at least include, a case study.

This initial preparation should include a survey of the regulatory or policy framework with regards to information (constitutional law, common laws, statutory controls, enacted statutes, national guidelines, decrees, etc.). It may be useful to show any overlapping inconsistencies and contradictions in current legal regulations and policies.

The information thus collected serves three main purposes:

- to highlight the need for a national policy on terminology;
- to appraise the extent to which professionals and users at large already recognize this need; and
- to identify gaps and inadequacies in existing policies.

Background document(s) should include:

- an introduction to the physical, social, economic and administrative environment;
- an assessment of major national goals (comprising also the political and sector-specific priorities in the national development plan);
- an assessment of the socio-economic situation of the language communities involved;
- an assessment of national terminology and language resources, including the analysis of the status of terminologies in each language;
- an assessment of major terminology and language institutions, their resources and services;
- an assessment of national users: the major types of institutional and individual users, their needs and terminology requirements;
- an assessment of the current language policy situation: the scope and coverage of this policy, mechanisms for their formulation and enforcement, and their inadequacies;
- a summary conclusion stating the need for a terminology policy, outlining the level of recognition and the main constraints associated with its implementation.

Work during the preparation phase is likely to be performed primarily by domain experts – organized in a committee or in a number of working groups coordinated by a steering person, group or institution. Special care should be given to formulating ideas and presenting results in a concise and easily understood way in order to ensure clear understanding on the part of all stakeholders and decision makers.

4.1.2 Awareness raising activities and efforts to obtain recognition

As already stated above, official support or at least official encouragement should be obtained right at the beginning of the process of preparing, formulating and implementing a terminology policy. This criterion often requires activities designed to raise awareness before any official mandate or recognition is granted preparatory to implementing a terminology policy. The nature of the campaign to raise awareness may change over time. Throughout this initial stage it is recommended that administrators, decision makers, legislators, and subject field experts, as well as prominent figures in society and the media, be included. The active support of key individuals who understand the aims of the project can be crucial in establishing a firm foundation for future work.

To a certain degree these efforts should already identify any existing documents (studies, research, investigations, etc.), collect foreign examples and experiences, and pinpoint gaps which need to be filled in order to prepare for the assessment of the local language and terminology environment.

4.1.3 Recommendation of methodology and procedures

Once analyses and assessments have been completed and goals and the scope of the program have been identified, a detailed outline should be prepared indicating the most appropriate methodology to be applied and the procedures to be followed. These methods and procedures may differ considerably between language communities on the one hand and between domain experts and user communities on the other. They should also be viewed from the perspective of existing or needed resources and capacities. References to examples of best practice from foreign models and experiences are highly valuable in this process, bearing in mind local sensitivities.

The recommendations formulated at this stage should be concise and clearly geared towards facilitating the decision making process for the next phase.

4.1.4 Preparation of preliminary documents

The preparation of preliminary documents serves two main purposes:

- to ultimately consolidate the investigation and assessment results matched against existing resources and capacities;
- to provide a basis for a constructive nation-wide (or language community-wide) public consultation on the issues related to a terminology policy.

The results from the assessment of the current situation as cited in 4.4.1 should be compiled in one or more concise background documents, showing and analyzing the findings so far, in order to identify the principal problem areas which are most likely to influence the national policy on language and terminology. This focused analysis, together with the background document(s) cited above, can be submitted for public review at the national level, thus constituting the main working document(s) for consultation at that level. Some countries, however, may prefer to combine both the background and the analysis into a single document. But this choice has no significant impact on the consultation.

With respect to the layout and presentation of these documents, special care should be taken to produce clear and simple formulations and presentations so that non-experts (administrators, decision makers, legislators, and – last but not least – the general public) can easily grasp their meaning.

4.1.5 Organization of a community-wide consultation procedure

In most cases it is very useful to organize and conduct a selective consultation process even in the course of preparing the preliminary documents. Depending on the actual situation of the language community in question, the nation-wide or community-wide public consultation process could also occur at a later stage or be repeated during any major step in the process of formulation and implementation of the terminology policy. Such consultations can have different goals and, therefore, may take different forms, such as:

- meetings;
- interviews;
- surveys (e.g. by means of questionnaires).

The results of the consultation(s) must be recorded, summarized and integrated into the terminology policy formulation process as well as into any accompanying promotional activities.

4.2 PHASE II – Formulation of the Terminology Policy

As soon as the activities outlined in phase I have been completed, the national terminology policy can be drafted according to the resulting mandate. This phase comprises:

- drafting the terminology policy proposal;
- drafting a plan for the coordination of the terminology policy with other strategic planning policies;
- preparation of a plan for the implementation of the project;
- presentation of the draft final policy (document and implementation plan);
- decision on the final policy (document and implementation plan).

Countries often restrict the coverage of their terminological policies to scientific-technical information (STI) and the respective information resources and services. Awareness of the fact that terminology is an indispensable part of scientific-technical information (STI), should be gradually built up in connection with the promotion of STI as a common resource having an important market value and capable of serving the country's social, cultural and economic development.

4.2.1 Drafting the terminology policy proposal

It is expected that the terminology policy developed according to this approach will ensure that the terminology requirements of the country or language community are satisfied as comprehensively as scarce resources allow. In the draft terminology policy proposal, the concrete objectives, scope, benefits, main stakeholders and the directions to follow in the implementation of the terminology policy have to be formulated in such a way as to facilitate the political decision making process. At this stage, it may be useful to create an evaluation process for the individual parts of the draft involving many people of relevance to the later implementation in order to reveal any implications that have so far been overlooked or either under- or overestimated.

4.2.2 Co-ordination of terminology planning with other strategic planning policies

Remarkable developments in recent years towards a global information and knowledge society have generated a significant evolution in the attitudes of governments towards information activities, pressing them to revise their national priorities and to establish new policies. Decision making and planning today need data from national and international sources, which requires terminology in social, financial, scientific-technical, and cultural fields. The terminology policy thus should not be looked upon as an isolated matter, but as a document that is coordinated with the general development strategy or policy and/or other development-related strategies and policies. This objective can be realized in the form of a terminology policy integration statement serving several objectives:

- to link the terminology policy to the overall development policy;
- to position the terminology policy with respect to national development activities (thus justifying the need for resources and capacities);
- to provide guidance to government agencies and private corporations as well as to NGOs and NPOs for the management and planning of resources and services;
- to establish a basis for any future review of the terminology policy according to changing circumstances;
- to link the terminology policy to scientific-technical translation policies and related policies of managing multilingual communication processes;
- to highlight the impact on the terminology policy of other interrelated policies.

A document on these co-ordination issues will possibly have to accompany the terminology policy proposal.

4.2.3 Implementation plan

The effective development of regional and national terminology planning and networks may depend to a large measure on the existence of all kinds of other national infrastructures. It is being increasingly realized that the development of such an infrastructure and its contribution to regional and national cooperation in the information field will be facilitated by the formulation and implementation of appropriate terminology policies on specific resources and services. This step, as well as timely planning and the availability of adequate human resources, play an important role in the plan for implementing the terminology policy. The request for funds for the implementation must be realistically proportionate to the objectives, scope and goals as well as the benefits to be expected. Specifically, the implementation plan will include:

- the selection of suitable strategies to achieve the objectives as well as the various goals of the terminology policy within a given period of time;

- the assignment of priorities to various terminology policy issues;
- the allocation of resources for the implementation of related programmes;
- a proposal for a co-ordination mechanism (within the terminology policy and vis-à-vis other policies).

Depending on the scope of the terminology policy and on the complexity of the situation, the above-mentioned strategic management issues have to be based on preliminary investigations concerning:

- the establishment of a mechanism for the implementation of terminology policy related activities;
- the development of a plan of action for the achievement of policy goals;
- the provision of financial resources for the implementation of terminology policy related activities;
- the design of measures aimed at periodic assessments of and adjustments in the action plan.

In most cases a draft implementation plan will have to accompany the terminology policy proposal.

4.2.4 Presentation of the policy documents and implementation plan

It is important to explore the various steps in drafting the final policy text and in motivating the professional communities concerned with supporting these activities. The draft final terminology policy text should be a clearly drafted, relatively short document, which provides accurate and up-to-date information on the issues that require the attention of government or of other political decision makers. This document is needed:

- as a basis for drafting a legal text to be presented for official approval;
- to provide easy reference to the issues in the proposed terminology policy;
- to provide insight into the implications of the terminology policy implementation, both in terms of actions to be undertaken and resources required.

It is of particular importance to clearly outline the strengths and the weaknesses of the current terminology situation in the country or language community.

Special attention should finally be given also to the layout of this document, as it is intended to be a reference document for administrators, decision makers and legislators who are not in the field of terminology and whose task will be to approve this policy.

It is also essential to select the most favourable point in time to present new policies to government for endorsement and co-ordination with other policies, as timing at this point can be crucial for success.

4.2.5 Decision on final terminology policy documents and implementation plan

The official approval of the final terminology policy can occur in several ways:

- through promulgation or enactment of a law (or other kind of legal provision):
 - referring to the final terminology policy document and implementation plan;
 - on the basis of the final terminology policy (document and implementation plan);
- by official adoption and a mandate to the implementation body to start with the implementation;
- other kinds of official approval, especially when non-governmental institutions establish their terminology policies.

It is not only important that this document bear the official stamp of approval from administrators, politicians, legislators, decision makers (in NGOs and NPOs), the public and the media, but that it definitely be a true plan for action, not just a mere piece of paper, and that the signees will support it along the line as it is carried out.

4.3 PHASE III – Implementation of the Terminology Policy

In most cases the documents and proposals prepared thus far have to be streamlined into concrete action plans and other operational planning documents in PHASE III for implementation to be facilitated. This phase may comprise:

- the overall management of the implementation;
- the operational and organizational planning of the implementation;
- the planning of publicity and promotional activities.

Again, the pro-active involvement of administrators, politicians, legislators, the media and of prominent figures in society may be crucial for the success of the actual implementation of the terminology policy.

4.3.1 Management of the implementation

Depending on the size of the language community, the complexity of the situation and the scope of the terminology policy, its implementation can be managed by:

- one or several government institutions;
- a committee or other group of people;

- an existing institution or organization, which is entrusted with this task;
- a newly established institution or organization.

A decision on the body, institution or organization or other kind of structure to manage and carry out the implementation of the terminology policy is very important. In reaching this decision, the results of the investigations, assessments and consultations should be taken into account. The quality of the background documents and of the initial investigations is again of great importance. However, considerations related to the actual political situation may have an impact on this decision. At any rate, a fallback option should be envisaged in case the designated body, institution or organization does not perform according to expectations.

4.3.2 Operational and organizational planning of the implementation

Based on earlier investigations and recommendations, decisions have to be taken concerning:

- the establishment of a coordination mechanism;
- the formulation of an action plan and procedures for carrying it out;
- the allotment of human and financial resources;
- the implementation of a monitoring mechanism.

It is also important to lay down clear tasks and milestones and to define results that will be both quantifiable as well as indirectly beneficial.

The implementation most probably will be accompanied by an evaluation and assessment mechanism, which allows for timely corrections and adjustments in the operational and organizational planning of the implementation.

4.3.3 Publicity and promotion

During the implementation phase publicity and promotion are very important to ensure the success of the implementation. Ultimately the terminology policy and its implementation will fail, if the attitude of the general public is indifferent or even hostile towards the policy. Here a diligent use of the educational system might be suitable. In any case, publicity and promotion measures also need to be carefully and systematically planned, carried out and assessed. It is critical not only to cooperate with the media, but also to carefully design media events and activities to meet the needs and expectations of the local audience. Media expressions can take the form of radio broadcasts (such as community radio), theatre groups (e.g. for health education, especially in rural or underprivileged areas), flyers (e.g. in hospitals), etc. A crucial dissemination channel is education and training at all age levels.

4.4 PHASE IV – Sustaining the Terminology Infrastructure

Ultimately the terminology policy should – even at the stage of its implementation, which represents a significant national investment – consider the future sustained operation of the terminology infrastructure. Mechanisms for adapting the terminology policy as well as the infrastructures according to new situations must be foreseen. Change management is one of the major job requirements for the managers of a terminology infrastructure.

Figure 2 below summarizes the phases (bearing in mind that the phases and tasks may not take place sequentially, but may overlap and sometimes even take place simultaneously):

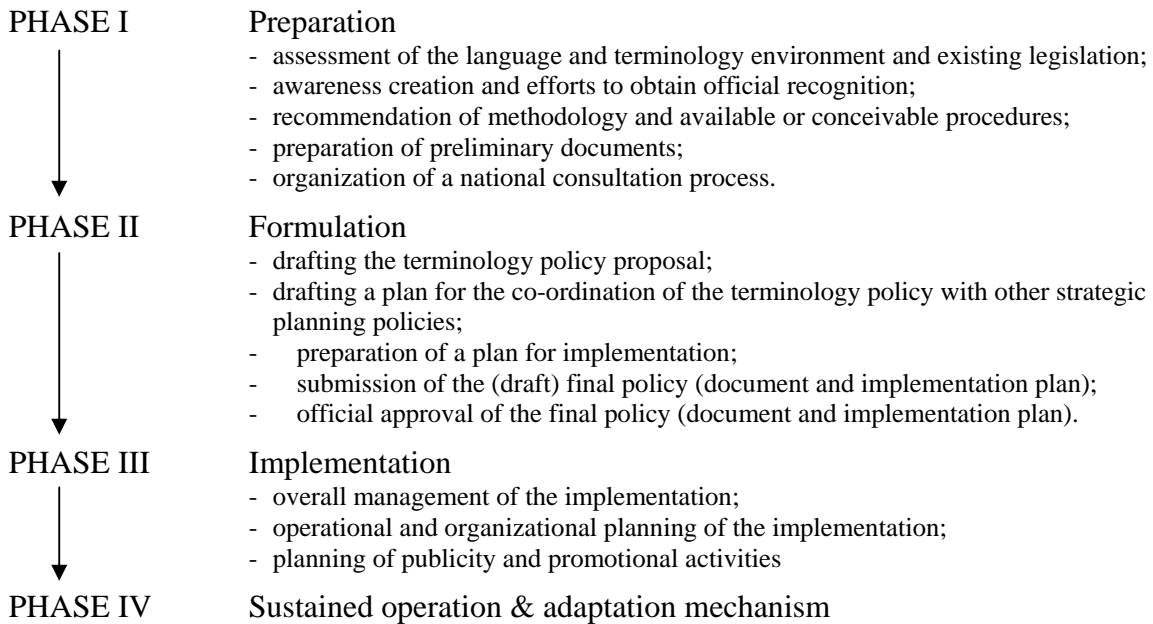


Figure 2: Summary of the phases

Summary

The present Guidelines are based on the experience with terminology planning and terminology policy reported in numerous countries at different levels of economic development all over the world. The probability that national terminology policies will be successful is higher, when the following criteria are fulfilled:

- pursuing integrative and co-operative approaches that are open and pragmatic;
- actively supporting Human Resource Management for internal staff, career planning, and eLearning in relevant institutions and networks;
- implementing Knowledge Management (knowledge sharing) schemes for relevant institutions and networks as well as for co-operation partners in the country and on the international level;
- maintaining a close connection to technological innovation and knowledge transfer;
- securing a high degree of education and linguistic expertise;
- designing a realistic and sustainable use of information and communication technologies (ICT) and especially of human language technologies (HLT);
- considering research-based methods and policies;
- implanting professional management, trust, motivation, common visions and identities.

The political, social and economic situation in a country as well as the size of a given language community will almost undoubtedly dictate different approaches to the development of a terminology policy. There are, however, some very basic considerations, no matter what the particular situation looks like:

1) Invest in thorough preparation: as outlined in this publication, the preparatory studies and the resulting documents form the basis for all subsequent activities concerning the terminology policy. They serve as internal reference documents as well as basic argumentation documents for public distribution. The more detailed and comprehensive these studies are, the greater the savings in time and financial resources will ultimately be. There are also implications for canvassing support for the terminology policy nationally and internationally.

2) Learn from experiences of other countries: of course the success stories and best practices in real terminology policy implementation should be carefully studied. But also the analysis of the examples of failure and their assessment can be extremely useful in the design, planning and implementation of a terminology policy. By studying these real-life

experiences one can avoid pit-falls that other countries have already encountered, and benefit from best practices.

3) Include stakeholders: formulating and implementing a terminology policy is an activity that needs to be endorsed by a large number of persons and institutions. Even when an initiative is launched by a group of key interested parties, the sphere of those involved should grow to include all important stakeholders and decision-makers and they should be involved in the process as early as possible. It is important to harness the motivating power created by a broad spirit of inclusiveness and to avoid negative attitudes that may arise if stakeholders feel overlooked, disregarded or left out of the process of creating a terminology policy.

4) Introduce collaborative work methods: best results are achieved, in particular in language and terminology development, when linguists, terminologists, and domain experts work together in committees, because typically, these divergent experts have different reservoirs of knowledge and experience to contribute to a complex task:

- domain knowledge (conceptual knowledge);
- linguistic knowledge (generic and language-specific);
- terminological knowledge (work methods, bridging the gap between these two worlds).

However, the procedures as well as the respective workflow management for net-based computer supported cooperative work (CSCW) should be designed very carefully in order to become efficient and effective. This may need some time for implementation.

5) Start capacity building as early as possible: a terminology policy is not meant to be a static plan but a living and developing instrument that has to be adapted to a changing environment. Given the interdisciplinary nature of terminology and its applications, many well-trained experts are needed to implement it. The education and training of these experts should start as early as possible to avoid gaps in successfully implementing the terminology policy.

6) Create awareness in the whole language community: only if the terminology policy is accepted by and known to those who are supposed to benefit, can successful implementation be guaranteed.

ANNEX – Terms Used in These Guidelines

In order to improve the readability of the text of these Guidelines, some of the core terms are explained hereunder. For standardized terms of the vocabulary of terminology work and their stringent definitions please consult the International Standard ISO 1087:2000.

Communication: (in this document:) inter-human communication in spoken or written form or in the form of non-verbal communication

Communication planning: (in this document:) planning activity connected with inter-human communication that subsumes **language planning** and **terminology planning**, whether such an activity is language focused in the strict sense or is more broadly organizational, technical and infrastructural

De-terminologization: linguistic process, in which terms (representing concepts in SPL) become used as lexical units (e.g. words) in the respective GPL \leftrightarrow terminologization

Domain: (in this document:) scientific-technical subject-field or other field of expertise

Domain communication: (synonyms:) specialized communication; scientific-technical communication; professional communication – NOT: technical communication; inter-human communication in a **domain**, which in the pragmatic sense includes scientific-technical subject-fields as well as other fields of expertise

General-purpose language (GPL): (synonym:) everyday language; language used largely for everyday purposes by a language community

GPL: general-purpose language

HLTs: human language technologies

Human language technologies (HLTs): technologies applying the knowledge of language to the development of computer systems that can recognize, understand, interpret and generate human language in all forms, in order to develop applications that make it possible for human beings to interact directly with computers

Language engineering: subject field dealing with **natural language processing (NLP)**

Language planning: (in this document:) activity dealing with language development that covers a mixture of methods and approaches, including terminology and lexicography, terminology management, translation and translation management, and increasingly, corpus-based approaches (term extraction, corpus analysis for spotting neologisms coined in discourse communities, etc.)

NOTE: As in other fields dealing with language, the use of human language technologies (HLTs) is also increasing in language planning.

Linguistic norm: set of language conventions, which is considered to be the shared linguistic standard of a language community

NOTE: There may be all kinds of variations (such as dialects) whose conventions deviate from the linguistic norm.

National terminology policy: public strategy formulated at the level of political decision making in a country or in a more or less autonomous language community (within a country or a region that spreads across the borders of two or more countries) with the aim of developing or regulating emerging and existing terminologies for an array of purposes

Natural language processing (NLP): research and development activity that designs and builds software to analyze, understand, and generate languages which humans use naturally

NLP: natural language processing

Special purpose language (SPL): (synonym:) specialized language; language used by expert communities with a smaller or greater share of terminology and domain-specific linguistic conventions

SPL: special purpose language

Technical communication: (synonyms:) technical writing; technical documentation; (in this document:) the preparation of documents written in or largely containing special purpose language text

Terminological tool: terminology application software, such as a **terminology management system (TMS)** used for handling terminological data in some way or other

Terminologies: sets of designations used in given SPLs

Terminologization: linguistic process, in which lexical units (e.g. words) of the GPL become used as terms (representing concepts in the respective SPL) \leftrightarrow de-terminologization

Terminology database (TDB): database containing mono- or multilingual terminological data and being established at country, language community or local level depending on the needs of the respective communities

Terminology management system (TMS): software designed and built to process terminological data in a dedicated way or integrated into other kinds of application software

Terminology market: market constituted by users and the providers of terminological products and services

Terminology planning: planning activity, which develops language largely according to the needs and requirements of **domain communication**

Terminology product: result of a terminological activity in the form of a product, which may be a conventional terminological publication (such as terminology standard, SPL dictionary, glossary, vocabulary, etc.), a data collection in electronic form (e.g. **terminology database**) or a **terminological tool**

Terminology science: subject field that investigates the structure, formation, development, usage and management of the **terminologies** in various subject fields, and that prepares the methodological foundation for many applications

Terminology service: service based on using terminological principles, methods, data or tools, such as terminology research on demand, terminology consultancy and training service, terminology information and documentation, outsourcing of terminological tasks and information services, etc.

TMS: terminology management system

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ISO 639-2:1998 Code for the representation of names of languages - Part 2: Alpha-3 code (ISO 639-2/RA - Registration Authority for the maintenance of the code: Library of Congress <http://lcweb.loc.gov/standards/iso639-2/>)

ISO 704:2000 Terminology work - Principles and methods

ISO 860:1996 Terminology work - Harmonization of concepts and terms (under review)

ISO 1087-1:2000 Terminology - Vocabulary - Part 1: General Concepts

ISO 1087-2:2000 Terminology work - Vocabulary - Part 2: Computer applications

ISO 1951:1997 Lexicographical symbols particularly for use in classified defining vocabularies (under revision)

ISO 10241:1992 Preparation and layout of international terminology standards (under revision)

ISO 12199:2000(E) Alphabetical ordering of multilingual terminological and lexicographical data represented in the Latin alphabet

ISO 12200:1999 Computer applications in terminology - Machine-readable terminology interchange format (MARTIF) - Negotiated interchange

ISO 12616:2001 Translation-oriented terminography

ISO/TR 12618:1994 Computer aids in terminology - Creation and use of terminological databases and text corpora (under revision)

ISO 12620:1999 Computer applications in terminology - Data categories

ISO 15188:2001 Project management guidelines for terminology standardisation

ISO 16642:2003 Computer applications in terminology - Terminology Markup Framework (TMF)

International Standards in preparation:

ISO/AWI 860 Terminology work - Harmonization of concepts and terms (Revision of ISO 860:1996)

ISO/WD 1951 Presentation/Representation of entries in specialized dictionaries (Revision of ISO1951:1997)

ISO/WD 10241 International terminology standards - Preparation and layout (Revision of ISO 10241:1992)

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ISO/PWI 12620-2 Computer applications in terminology - Data Categories - Part 2: Terminological data categories (Revision of ISO 12620:1999)

ISO/NP 21829 Terminology of language resource management

ISO/PWI 22128 Quality assurance guidelines for terminology products

ISO/AWI 22134 Terminology in sociolinguistic application

ISO/WD 24613 Lexical Markup Framework (LMF)