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Research article

Terminological usability – adapting terminological databases to different user groups according to usability principles: The case of UniVieTerm

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Terminological databases are a means to manage and access specialist knowledge. Since they are specialist tools, non-terminologists may face difficulties when using terminological databases, not only content-wise but also as an application. Since the usability of terminological databases is still an underexplored area in academic literature, this paper shows the challenges and possible solutions in making adaptations to a terminological database for university terminology at the University of Vienna. These adaptations were aimed at striking a balance between usability requirements on the one hand, and terminology management according to international terminology standards and interoperability of terminological data, on the other. Illustrated by the University of Vienna's terminological database UniVieTerm, this paper highlights how creators of terminological resources can influence the terminological usability of terminological databases, thereby focussing on the areas of user interface design and workflows, including user engagement.

Keywords: terminology management, user needs, terminology workflow, university terminology

L’utilisabilité terminologique – adapter des bases de données terminologiques à différents groupes d'utilisateurs selon les principes de l'utilisabilité : le cas d'UniVieTerm

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Les bases de données terminologiques sont un moyen de gérer des connaissances spécialisées et d’y accéder. Puisqu'il s'agit d'outils spécialisés, les non-terminologues peuvent rencontrer des difficultés lors de l'utilisation des bases de données terminologiques, non seulement en termes de contenu, mais aussi en tant qu'applications. La facilité d'utilisation des bases de données terminologiques est un domaine encore peu exploré dans la littérature académique, aussi cet article montre-t-il quels sont les défis que pose l’adaptation d’une base de données terminologiques pour la terminologie universitaire, à l'Université de Vienne, et propose de possibles solutions à ces problèmes. Les modifications opérées visaient à trouver un équilibre entre les exigences de convivialité, d'une part, et la gestion de la terminologie conformément aux normes terminologiques internationales et l'interopérabilité des données terminologiques, d'autre part. Illustré par la base de données terminologiques UniVieTerm de l'Université de Vienne, cet article met en évidence comment les créateurs de ressources terminologiques peuvent influencer l'utilisabilité terminologique des bases de données terminologiques, et insiste notamment sur la conception de l'interface utilisateur et sur les flux de travail y afférents, y compris sur l'engagement de l'utilisateur.

Mots-clés : gestion de la terminologie, besoins des utilisateurs, flux de travail des travaux terminologiques, terminologie universitaire

1 Introduction

Terminology, by definition, belongs to a specialised language and is therefore intended for domain experts. However, also non-specialists are confronted with terminology from a wide range of specialised languages once in a while. Terminological databases are a means to access and manage this specialist knowledge. Therefore, terminological databases are specialist tools as well. This means that non-terminologists may face difficulties when using terminological databases, not only content-wise but also as an application.

This paper addresses the concept and practical implementation of terminological usability. According to the related ISO standard (ISO 9241-11), usability is referring to the extent to which a product can be used by certain users to achieve goals effectively, efficiently and satisfactorily in a certain context. The usability of terminological databases is still an underexplored area in academic literature (Marcos & et al., 2006; Sevriens, 2010) despite the fact that usability plays a dual role in terminology. On the one hand, it can refer to the usability of a terminological database, i.e. the terminology management systems, e.g. its user interface, including its functions and navigation. On the other hand, usability can also refer to the usefulness of the content of a terminological resource for a given user. Therefore, creators of terminological databases can influence this terminological usability in several ways, including the design of the terminological database and its contents as well as the workflows for terminology work that may integrate certain user groups in terminology management. Terminologists can engage users in the further development of the terminological database and in quality assurance. This is exemplified by the University of Vienna's terminological database UniVieTerm in the following sections.

2 UniVieTerm background

UniVieTerm is the official terminological database of the University of Vienna. It covers several fields of activity of the University, ranging from higher education, studying and teaching to research and administration, organisation and law.

The UniVieTerm project started in 2011. Following its conceptualisation and technical implementation stages, the resulting terminological database was officially launched in 2013. Back then, it was made available to all employees of the University of Vienna through the University's intranet. The users could log in by means of a single sign-on system. Now, the database is publicly available.

The Corporate Communications service unit at the University is responsible for the maintenance of the terminological database, including two translators, of which one is also a terminologist. In the period between 2011 and 2013, a so-called terminology network was established, consisting of terminologists, Anglicists, English native speakers, representatives from the University's service units and translators. This

terminology network was responsible for standardising terminology in two domains, i.e. the domain of studies and teaching and of administrative functions at the University. This initial set of terminological entries should serve as a basis covering the most essential terms used at the University. This content should provide a first set of terminological entries making the terminological database attractive to the users.

UniVieTerm is continuously expanded and updated. The growth of the terminological database is often subject to large-scale translation assignments requiring terminology work, such as the translation of strategic documents and policies or the introduction of new processes and systems at the University. Especially the introduction of new systems and processes is accompanied by coining new terms. Therefore, terminology work for UniVieTerm is mainly translation-oriented, ad-hoc terminology work.

Currently, at the end of 2022, UniVieTerm contains 10,690 terminological entries, comprising 19,022 terms in German and 24,643 terms in English. From these 10,690 terminological entries, only half of them (5,658 entries) are visible to the users who are not terminologists. This means that only terminologists can see all the terminological entries in the database, including those entries that are still work in progress and require final validation, i.e. entries that have not undergone the entire terminology workflows yet.

The first step in creating the terminological database was the identification of the user groups, followed by a needs assessment (see section 3). The usability of UniVieTerm was of the utmost importance. Therefore, in an iterative process, the user needs were assessed and specified. Pilot studies were run with a small user group from the service unit Corporate Communications of the University Vienna. Although this was a convenience sample since the terminological database is maintained by this service unit, it still reflected the diverse needs of university employees.

Regarding the underlying technology, a commercial system (Quickterm by Kaleidoscope) was used as a basis and adapted to the user's needs, following consultation with the University's service unit responsible for IT.

2.1 Bilingual terminological database

UniVieTerm is a bilingual (German-English) terminological database. In German, it has a focus on the Austrian system. Since the University of Vienna is embedded in the Austrian higher education and legal systems, also the German terminology is characterised by this framework. UniVieTerm is bilingual because German is the official language in Austria and English is considered a lingua franca. In English, 'international understandability' of the terminology was identified as the major objective. This means that no specific higher education system, e.g. of the United Kingdom, the United States or Australia was used as a main reference, but comparative terminology work was done for several English-language higher education systems. Moreover, since the Austrian

higher education system is also subject to the European Bologna system, also EU-specific terminology had to be considered.

Another challenge in terminology work was that German and English are languages with variants. Therefore, the questions whether to include other German variants besides Austrian German, and whether to concentrate on one English variant only had to be answered in the beginning. As Austrian German is influenced by the German variant of German due to German media as well as students and researchers studying and working in Austria, the UniVieTerm terminological database also contains university terms from other German-speaking countries. However, German variants are only included in UniVieTerm if they could be found in the corpus that served as a basis. This serves the purpose of illustrating differences between the administrative terminology of these countries. The use of different variants is also applicable to English terms used in UniVieTerm. However, also in this case, variants are only given if required for the purpose of finding the most appropriate 'equivalent' for translation purposes.

Although the introduction of the Bologna system aimed at the harmonisation of higher education in the European Union, the higher education systems are still very diverse. Therefore, the boundaries of higher education systems are usually national boundaries and not language boundaries. This means that there are also differences in higher education terminology within a language (Author 1). This applies in particular to the German language, where differences can be observed in Germany, Austria, Switzerland, Italy, etc. In addition, more pronounced differences exist between European higher education systems and higher education systems outside of Europe, including higher education systems in which English is used as an official language. Since there are already significant differences within a language, it is also hard to find equivalents in other languages.

Although the University does not have an official language policy, it has guidelines for the corporate language in English, including a style guide. Although the preferred English variant according to this style guide is British English, this does not mean that the university terms prevailing in Great Britain are used as equivalents for Austrian university terminology. The English preferred terms should be culture-independent, as far as possible. However, due to culture-bound terminology (Kristiansen, 2014), this was only possible to a limited extent. A terminology standardisation committee (the so-called terminology network) was established to decide on the preferred English terms, while the preferred German terms are already specified by law in certain domains. The tasks of the terminology standardisation committee as well as the steps towards its establishment are described in the following.

2.2 From descriptive to semi-prescriptive terminology work

The UniVieTerm terminology project started with descriptive terminology work. The first steps were the collection of already existing terminological resources, both inside and

outside of the University of Vienna, followed by terminology extraction from an internally created corpus of university texts in German and English. Terminology extraction from this corpus revealed that for one German designation several different English designations were used at the University. Therefore, one of the first aims of the UniVieTerm project was to standardise the terminology related to studies and teaching at the University by defining preferred terms in English. Since "the aim of standardisation is to reduce terminological variation" (Chiocchetti & Ralli, 2013), a terminology standardisation committee was tasked with selecting preferred English terms for terminology in the areas of studying and teaching. The term candidates selected by the terminologist were further discussed among the terminology standardisation committee based on certain criteria, such as finding a transparent, precise and frequently used term. This way, the terminology standardisation committee decided on the most appropriate, (equivalent) English term for a German designation or coined new ones. In some cases, the German terms were also used in English to highlight the peculiarities of the organisation at the University of Vienna.

At a university, which is characterised by academic freedom, prescriptive terminology is a sensitive topic as it interferes with an individual person's language preferences. Therefore, the University of Vienna decided on striking a balance between descriptive and prescriptive terminology work by introducing semi-prescriptive terminology work. The aim of this semi-prescriptive terminology work at the University of Vienna is a consistent use of terminology in (administrative) university texts as well as guaranteeing precision in the use of university terminology. Precision and consistency in terminology aim at facilitating internal and external communication and are part of the corporate identity, including the corporate language of the University of Vienna. Moreover, consistent terminology should minimise misunderstandings in communication situations, especially between the University and its (prospective) students, and the University and its employees.

This means that terminology work at the University of Vienna in the area of university terminology generally follows the principles of prescriptive terminology work, but the preferred terms are rather "recommended" terms. Deprecated terms are marked as "usage: not recommended". The preferred terms must be used by administrative university staff, i.e. staff working at central support units, such as the admission office, study coordination or human resources. For academic university staff, however, the English terminology in UniVieTerm does not have prescriptive character. This is also reflected in the user interface, where the preferred terms are highlighted as "recommended" terms (Figure 2). Also, obsolete or deprecated terms are displayed in the terminological database, including a relevant usage note and colour code. This is also relevant to usability which will be discussed further below.

2.3 From systematic terminology work to translation-oriented, ad-hoc terminology work

Initially, the collection of terms for UniVieTerm was based on systematic terminology work as described by Mayer (2009) and concentrated on administrative university terminology and its subfields that are derived from the internal structure of the University. However, ad-hoc terminology work and translation-based terminology work are currently the main activities contributing to the growth and maintenance of UniVieTerm. Additionally, terminology work is done upon request, e.g. if external translators or university employees ask for 'English translations' of German university terms. This is also due to the fact that terminology work is one of the responsibilities of the team of in-house translators at the University. The terminological database should also allow users to request terms that they did not find in UniVieTerm or provide feedback on already existing terminological entries.

To sum up, UniVieTerm is a terminological database characterised by descriptive terminology work supplemented by semi-prescriptive terminology, which is reflected in the employees' degree of freedom in using the preferred (i.e. "recommended") terms specified in UniVieTerm.

In the following, the adaptation of this terminological database, including the adjustment to the corporate design (fonts, colours, etc.) and making it as usable as possible for non-terminologists is discussed.

3 User groups and needs assessment

Setting up a terminology database raises considerations about the users, their needs, previous experience and behaviour in order to provide information in the terminological database that satisfies the users' needs and prevents information overload. As users looking up terms in a terminological database rely on easily accessible information, usability plays an important role. Therefore, the concept of usability is used to assess the efficiency, effectiveness and satisfaction of users searching for terms in a terminological database.

Needs assessment is of particular importance in terminology since "[terminology is] a set of needs, a set of practises to resolve these needs" (Cabré Castellví, M. Teresa, 2003, p. 182). Therefore, the users and their needs determine the type of application, the languages included, and the information provided in a terminological entry, such as definitions, phraseology, contexts or illustrations. Furthermore, they also define the type of presentation of terminological information and of the dissemination (Cabré Castellví, M. Teresa, 2003, p. 183).

3.1 University employees

The main target group of the UniVieTerm terminological database are the employees of the University of Vienna, in addition to terminologists and translators. The employees of the University of Vienna are a heterogeneous group since it comprises both academic and non-academic university staff. Since the University of Vienna boasts a wealth of academic disciplines and has central support units that deal with diverse topics, such as finances, facility management, the IT infrastructure, human resources, study administration and research support services, the terminological database covers a diverse range of domains. However, not all domains are covered to an equal extent in UniVieTerm at the moment.

This means that the main users of UniVieTerm are non-terminologists. Therefore, UniVieTerm's usability plays a central role for this target group. The employees have different expertise and, generally, no knowledge of terminology. To make the terminological database as usable as possible for these user groups, a needs assessment was made, followed by tests with a small number of users.

As non-terminologists want to use a terminological database immediately without having to read a manual, they should be able to use UniVieTerm intuitively. Intuition is based on the users' past general computer experience and experience with (other) search systems and bilingual dictionaries, in particular. Therefore, the UniVieTerm design is based on the assumption that university employees have experience with search engines and online dictionaries and know how to use them. Therefore, UniVieTerm should be as easily usable as a search engine or an online dictionary. However, many terminology management systems available on the market are primarily tailored to the needs of terminologists (Author 1).

As the university staff comprises several thousand people in a wide range of organisational units and roles, the user group is heterogeneous, as are their needs. Among the needs identified among this user group were easily findability of (preferred) terms, making suggestions for the entry of a search term, providing additional information on an already existing entry (e.g. suggesting another term or a definition) or requesting the correction of an error. This feedback option is also a crucial aspect of quality assurance. As mentioned before, the initial focus of UniVieTerm was on the domain of studying and teaching. In contrast to studying and teaching terminology, other sub-domains of administrative university terminology were not as exhaustively dealt with in UniVieTerm in the first phase. Therefore, employees play an important role in quality control and the expansion of the terminological database.

Further needs voiced following the launch of UniVieTerm were domain-specific terminological databases for the disciplines represented in research and teaching at the University, e.g. a terminological database for quantum physics or translation studies. Moreover, university employees also requested the inclusion of phraseology and

collocations in the terminological database to allow for the correct usage of terms in sentences in texts.
While in many terminological databases, the majority of users have a passive role, i.e. rather searching for terminological entries than contributing to them actively, in UniVieTerm collaborative terminology work deserves particular attention. Although terminology work is not conducted in a completely collaborative way, such as proposed by Kudashev (2013), UniVieTerm users nevertheless have the option of contributing to the terminological database by providing feedback and requesting, suggesting and liking terms.

Since the platform used for terminology workflows and terminology management (see section 5.1) allows for social features, such as the "entry of the week" or a "term quiz" (**Figure *1*.** UniVieTerm term quizFigure 1), these features were also used in UniVieTerm to increase the interest in terminology and the engagement with the terminological database. Moreover, the terminologists can recommend entries and users can like certain entries to have quick access on the platform's dashboard.

Figure 1. UniVieTerm term quiz: "What does 'introductory and orientation period' mean?". Users have to select one of the definitions to see if their answer is correct

3.2 University students

Although university employees were the primary target group in the first phase, students will become an important target group in the future. The majority of both students and university staff have no or only little experience in terminology work. Although they share their lack of knowledge of terminology, their needs are different. While university staff uses UniVieTerm mainly for translation purposes, (new) students may use the University of Vienna's terminological database also for knowledge acquisition, e.g. for looking up the definition of terms to find their way around the new university environment. As the student target group, especially new entrants, is often not yet familiar with university terminology, definitions and explanations in both languages would be of the utmost importance, whereas English equivalents for Austrian university terms are generally of higher relevance for university employees.

The need of student representatives expressed were access to the terminological database. In addition, the University's service unit responsible for student affairs also

voiced needs to increase the usability of UniVieTerm for students. These suggestions were, among others, including (explanatory) information about studying, university life and degree programmes for prospective students, admission procedures and general student communication in case of enquiries. Therefore, the service unit requested simpler definitions that would allow prospective and international students to understand the Austrian higher education system, in general, and the University of Vienna's system, in particular. However, these definitions would deviate from the definitions that employees need. To obtain further information about this user group, additional studies are needed.

3.3 Translators and terminologists

Another target group are (external) translators and terminologists. This target group is significantly smaller compared to the other two groups addressed above. Their needs are different from the other groups as well. The types of translators using UniVieTerm differ significantly: On the one hand, there are internal professional translators. Additionally, there are also non-professional translators, i.e. employees responsible for translation in their organisational unit due to their language proficiency. Both groups are familiar with the university system and usually need 'official equivalents' in another language when consulting UniVieTerm. Therefore, the preferred term in English should be easily findable. On the other hand, there are external translators who are occasionally working for the University. In contrast to the translators at the University, they are usually not familiar with the university system and require additional information, such as definitions (in the source language), explanations or contexts.

Terminologists are responsible for the entire terminology workflows (see below). They are responsible for both systematic and ad-hoc (translation-oriented) terminology work. They need and overview of the tasks related to terminology work. Only terminologists are allowed to create and edit entries in UniVieTerm. However, other users are able to voice their terminological needs. If the terminologists discover a terminological gap, they might propose terms, including neologisms to the terminology standardisation committee or elaborate on an English equivalent together with the terminology standardisation committee and/or domain experts.

3.4 Other users

A group of users that has not been mentioned so far are domain experts. The reason for this is that domain experts are a subgroup of university employees. They play a crucial role in terminology workflows and are tasked with providing or approving terms or definitions. The constellation of the expert groups that are consulted by the terminologists during terminology work depends on the relevant domain and (translation) assignment. Therefore, there are no permanent groups of domain experts. Since the domain experts are consulted only occasionally, they need brief information about what they are required to do and about the terminological data in question.

Providing and approving information should be as fast as possible, including a lean user interface, and avoiding too many steps and too many fields to be completed in the terminology workflow system.

In addition to these user groups, also the general public can access UniVieTerm. However, to adjust UniVieTerm to the needs of the general public, this user group would need to be subdivided into smaller user groups as well. Since the general public is currently not among the main target groups of UniVieTerm, it is not planned to adapt UniVieTerm to this user group.

In short, usability plays a central role for all target groups but the content, i.e. the sub-domains addressed, the type of terminological data provided in the terminological database and their form (of presentation) also depend on the relevant target group's previous experience with universities in general. The user groups addressed in the last section and the needs identified also demonstrate that UniVieTerm must be designed in a flexible way to be "multi-purpose" (Cabré, 1999, p. 181). This section demonstrated that UniVieTerm serves different purposes related to specialised communication depending on the needs of the different user groups. This also means that UniVieTerm has to cater for the needs of specialists, semi-specialists and non-specialists. These might include new members of the University of Vienna, such as new staff and students, who are learning about the new university environment as well as long-term members or the general public. In the future, the definition of more concrete situations of use, including text production, text reception and transfer, as well as refined user characteristics, such as language proficiency and different levels of domain knowledge (Ralli & Wissik, 2008) might help to further target the terminological database to the user needs. To cater for different user needs as far as possible, user engagement is crucial.

4 User engagement

Through feedback options users can directly contribute to the improvement of the UniVieTerm content. These may include simple adjustments, such as the correction of spelling mistakes or work-intensive contributions to systematic terminology work in a certain domain of the organisation, either monolingually or bilingually. As mentioned before, this feedback is an important aspect of quality assurance, including to inform the terminologists about a missing entry, to provide terms and their definitions or their equivalents in another language or to inform the terminologists about mistakes in a terminological entry. Therefore, collaborative terminology work and shared quality assurance by terminologists and users of terminological databases can be forms of user engagement.

4.1 Revision and quality assurance

Revision includes linguistic and formal revision as well as content revision. In addition to the terminologist and specialised translators, the user group of university employees are an important factor in assuring the quality of UniVieTerm. University employees are all experts in their fields of work and can provide valuable feedback on terminological entries: They can inform the terminologist about a missing term, a spelling mistake, an incomplete entry (e.g. a missing definition), an incorrect domain allocation or if they are not satisfied with the preferred term. This means that all users are part of the quality assurance mechanism and are also integrated in the linguistic, formal and content revision of entries in UniVieTerm.

Another aspect of quality assurance is that entries that are still elaborated on, incomplete or not yet approved by the terminology standardisation committee or domain experts are not visible in UniVieTerm (see also section 5). This holds true not only for whole entries but also for individual terms, i.e. terms that are not fully elaborated or were not yet discussed.

4.2 Communication

For a terminological database to be truly relevant and used, the target groups need to be made aware of the existence and the purpose of the terminological database. Therefore, targeted communication measures are necessary.

The aim of communicating terminology is to "raise awareness among all stakeholders on the importance of terminological activity" (Chiocchetti & Ralli, 2013). On the one hand, the terminology search tool itself can be a communication platform, i.e. for exchanging information, providing feedback, requesting entries of new terms, recommending and liking terms or chatting through the terminological database itself. On the other hand, other means of communication are necessary to inform non-users about the existence of UniVieTerm, e.g. presentations in meetings of stakeholders, Intranet news or information in newsletters. Furthermore, (external) translators need to be given access to UniVieTerm to meet the requirements of the translation brief, including consistent usage of university terminology in the translated text.

4.3 Cooperation

Cooperation is possible on several levels, either between roles, between units or between institutions (Chiocchetti & Ralli, 2013). For UniVieTerm, cooperation is mainly focussed on the levels of roles and units within the University. This includes cooperation between the terminologists and translators, domain experts and employees on the role level. On the level of units, this means cooperation between the administrative organisational unit responsible for terminology work in the area of university terminology and other university units, e.g. other administrative units and academic

units. On the institutional level, cooperation still needs to be developed. On this level, terminology cooperation would include the exchange with other universities or university-related organisations, such as the ministry responsible for science and research, in the field of university terminology.

4.4 Workflows

As specified in the steps of needs assessment and technical requirements when setting up UniVieTerm, UniVieTerm should allow for different workflows, including the consultation of experts, e.g. regarding definitions and the clarification of concepts, feedback by users, especially the request of terms by users if they have not found a term in UniVieTerm and the final release of a terminological entry in UniVieTerm depending on the defined approval and validation processes by the terminologist.

The workflow step in UniVieTerm defines the visibility status of a terminological entry. If the terminologist has not released a terminological entry, e.g. if terms are still in the approval or validation steps, the entire terminological entry is not visible to other users (see next section).

5 Adapting a terminological database to the needs of non-terminologists

The following section elaborates on the adaptation of an existing bilingual terminological database in an organisation to the needs of non-terminologists. In this case study, the managers of the terminological database are terminologists but none of the users are neither familiar with the terminology of terminology nor with the basics of terminology work. The users may just require ‘translations’, ‘definitions’ or ‘background information’. To ease the access to terminology for these users, usability principles are taken into account.

According to Cauna (2012), the main challenges in terminological database design and presentation are content, usability, i.e. the presentation of the content and speed. However, in usability engineering speed and content can be considered part of the product and elements of its usability. In general, the presentation of information in a terminological database influences the effectiveness of the user. It is important to carefully select what is presented in the terminological database and how it is presented. The interface of the terminological database should follow general design trends so that the users can easily find their way around the user interface and do not become frustrated. The navigation should be as simple as possible. The first screen should provide efficient information for the user. The terminological database search form should include smart search such as spelling correction, spelling variants and term suggestions while users are typing. Furthermore, terminological databases should be able to integrate other tools or to connect with other tools (Cauna, 2012), such as computer-assisted translation tools.

In the next section, decisions in the interest of usability are discussed, thereby focussing on the user interface of the terminological database, the forms of user engagement and the terminology workflows adapted to the users' needs.

5.1 Technology

Initially, the terminology management system used for UniVieTerm was SDL MultiTerm. However, due to the complexity of the software and due to the fact that it does not support terminology workflows, including approval processes or user feedback, alternative ways to give the main user groups access to terminological data were sought.

The technology used for the dissemination of terminology through UniVieTerm had to meet the needs of the different user groups. As the needs analysis has shown, UniVieTerm had to be flexible and meet the following criteria: quick entry and editing of terms by terminologists, option to suggest terms, user authentication (and different user interfaces based on permissions), flexibility regarding the design of the data fields, compatibility with the University's Intranet and computer-aided translation tools, the option to import and export data and to follow different workflows, including changes and additions in the terminological database. Therefore, the tool had to be a platform covering the entire workflow, from terminology suggestions to terminology standardisation and terminology dissemination. The tool had to allow for the display, storage, discussion, editing, validation and communication of terminology. Therefore, the system chosen was QuickTerm by Kaleidoscope, now Kalcium.

Regarding accessibility, the accessibility of UniVieTerm is related to the overall accessibility of the Kalcium platform, which currently allows to switch between a normal theme and a high contrast theme. Therefore, it would be desirable that UniVieTerm also meets additional requirements of the Web Content Accessibility Guidelines (W3C, 2008) in the future.

Other adaptations related to terminological usability are the engagement of the users in the further development of the terminological database. This needs to be reflected in the user interface as well.

5.2 User interface

Usability, which should be considered in product design from the very beginning, requires adaptations of the user interface of the terminological database, including different user interfaces for different user groups and different terminology, e.g. of functions and navigation in the user interface. Since the UniVieTerm terminological database covers different domains in which the University is active, including human resources, finance as well as education, the usefulness of the terminological database's content, i.e. the terminologies, for different user groups plays a significant role. Here, adaptations may require a deviation from common terminological principles as specified

in international standards on terminology (see below), such as deviations from the good practice of writing definitions, the number of definitions provided or the visibility of sources.

Also, in the interest of quality assurance and collaborative terminology work, users can provide feedback or like terms. Moreover, different workflows (and user interfaces) are provided for different user groups according to their needs and (working) preferences.

The layout of UniVieTerm deviated from the original Quickterm layout due to coherence with other university systems and to meet the user needs. The first version of UniVieTerm was adapted to the University of Vienna's corporate design, especially colours and fonts, as far as possible and according to the needs analysis. Following an update of Quickterm to a new platform, i.e. Kalcium, all the data were migrated to the new platform. Some adjustments according to the University's corporate design could be made as well, but the layout could not be changed to give the same look and feel of the first version of UniVieTerm. Therefore, the current UniVieTerm layout is the original Kalcium layout. This includes a configurable dashboard, including general information about UniVieTerm, a 'taxonomy' to set filters and different feedback options, such as requesting terms or providing feedback.

Moreover, to cater for different needs, different style sheets for the presentation of terminological entries were defined: On the one hand, a terminological entry just displaying the term and the "usage recommendation", i.e. the 'brief information' style sheet (Figure 2), on the other hand, a layout displaying all terminological data, the 'detailed information' style sheet (Figure 3).

5.3 Terminological entries

The structure and definition of terminological entries in UniVieTerm are based on ISO standards, such as ISO 704, ISO 26162 and ISO 12620. As UniVieTerm has heterogeneous user groups the names of data categories and data elements as well as the content and form of definitions are not always in accordance with these terminology standards. Some data categories' and data elements' designations are different in the terminological database as seen by the users and the terminological database as seen by terminologists. For example, the German designation for "context" is replaced by "example of usage" to be more comprehensible for users. However, the definitions and contexts displayed are the same for all users.

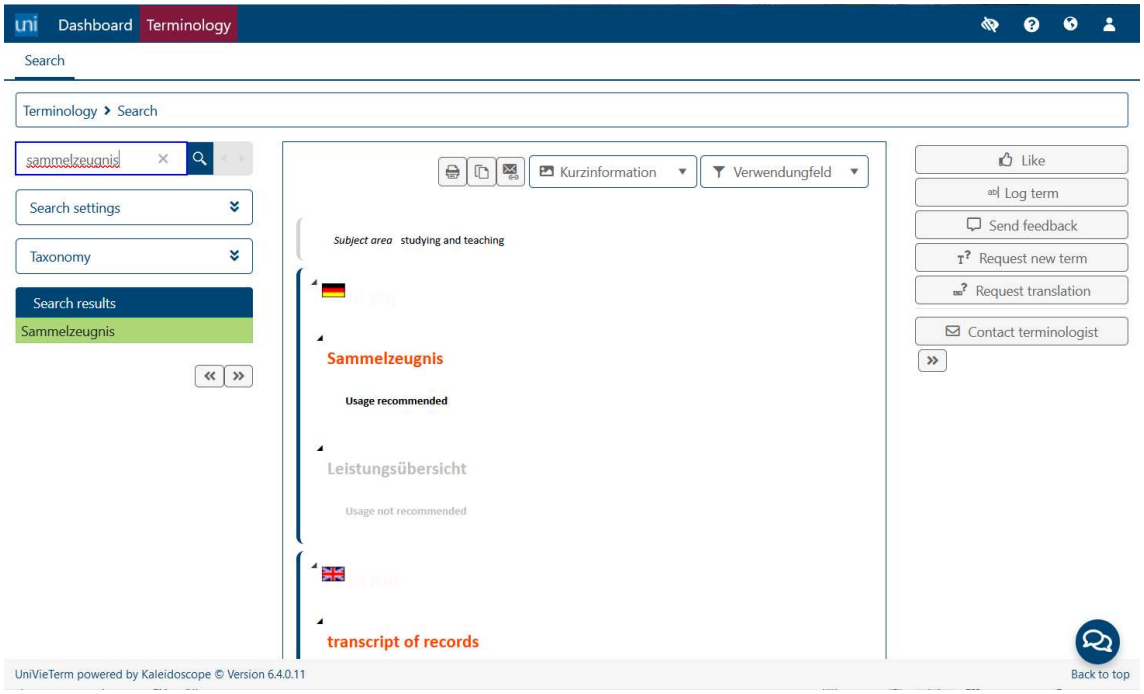

Figure 2. Terminological entry in UniVieTerm with the style sheet "brief information" providing the most important information for translation purposes

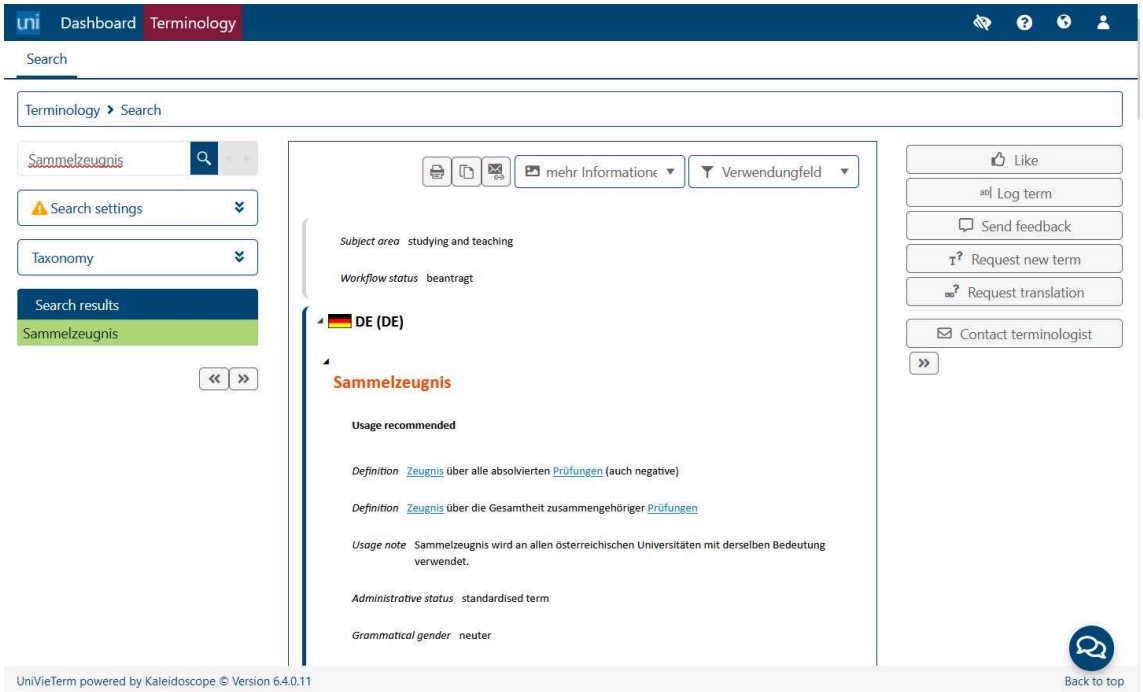

Figure 3. Terminological entry in UniVieTerm with the style sheet "detailed information" providing further information about the term.

Regarding the definitions provided, the UniVieTerm team decided to deviate from the principles of terminology management according to ISO standards on terminology work in several respects. These were, in particular, the use of several definitions for the same term on the term level. These definitions were extracted from the initial corpus of university texts. Therefore, UniVieTerm only contains existing definitions since the terminologists did not create any definition anew. This means that these definitions do often not start with the superordinate concept or provide the delimiting characteristics. Moreover, they are often very long and are sometimes rather explanations than definitions. For these reasons, the style, the number and quality of definitions are heterogenous. Although this is an unsatisfactory solution from the perspective of terminology management and might increase the cognitive load for users as they have to find their way through several definitions, it might also increase the usefulness of the content of the terminological database for the users. Since the definitions originate from resources targeted at different audiences, including new employees and (prospective) students, different definitions might also cater for these different information needs. This is also observed by Kalliokuusi and Varantola (1998) (cited in (Varantola, 2002), who states that "the terminologically correct definitions are correct from the point of view of the domain-specific concept system, but useless to anyone unfamiliar with the concept system and knowledge structures of the domain. It would thus be much more user-friendly to define special field concepts in different ways for users with different knowledge backgrounds" (Varantola, 2002, p. 41).

Moreover, since the linguistic register of these definitions is diverse, the provision of various definitions in one terminological entry might also cater for different levels of language proficiency. However, these assumptions would need to be tested in a separate study.

Regarding the visibility of sources, as mentioned above, all the terms actually used in the organisation were collected as part of descriptive terminology work during a first step. This descriptive terminology work served as the basis for subsequent prescriptive terminology work. The origin of all the terms was collected together with the terms in a 'source' field in the terminological database. Here, an ethical issue arose because the terminological database contains terms that were previously coined or used by organisational units but are currently deprecated. Due to these ethical considerations, a decision was made to not disclose the organisational units that use the "wrong" (i.e. deprecated) term. Thus, in UniVieTerm, it was deliberately chosen to hide the provenance, i.e. the source of the terms in order to not embarrass those organisational units that used the deprecated term. Since the pilot study has shown that some users were confused that not only the preferred but also the deprecated terms can be found in the terminological database, a colour code was developed to highlight the preferred terms and to decrease the prominent position of the deprecated ones. Moreover, different colours were used for terms in each language (Figure 2) to make them easily distinguishable. The deprecated terms were not removed from the database as

suggested by the users in the pilot study, because these terms are generally used and might help to acquire knowledge of a certain domain.

5.4 Workflows

Another adaptation to increase the usability of the terminological database are different terminology workflows for different domain experts. While some domain experts approve and release terminology via predefined workflows in the terminological database itself, other domain experts rather prefer to discuss terminological issues with the terminologists in person. Although this increases the amount of follow-up work for the terminologists, it is nevertheless an important step to meet the different needs of the user groups.

6 Discussion

UniVieTerm is the result of a combination of semi-prescriptive, systematic and ad-hoc terminology work with a strong orientation towards translation purposes. UniVieTerm was designed in a way that meets the needs of different user groups and, thus, various usability principles. Nevertheless, certain decisions had to strike a balance between user-centred design, practical framework conditions and adherence to international standards for terminology management. For example, the adaptation of the designations of the data categories in the terminological database from specialised language (the terminology of terminology) to general language was a decision in the interest of usability but at the detriment of good practice in terminology work. Here, the question arises whether it would be reasonable and feasible to educate the users about the terminology of terminology and familiarise them with the principles of terminology work. At least the difference between concept and term, which is less clear in German (since both can be referred to as “Begriff”) was maintained in the terminological database. However, in the interest of the usability of the terminological database and according to the aim of making it an attractive and frequently consulted terminological resource, the designations of data categories were adjusted to the employees’ language use. The risk that employees do not understand what certain data category names actually mean was rather high, which was also a finding from the first user tests. Since UniVieTerm should attract (and not repel) users, the UniVieTerm team decided to minimise the access hurdles as far as possible. This did not only include the design of the terminological database but also its content.

However, also the adaptation of the design and content of the terminological database has its limitations. One of these limitations is the terminology management system itself, which is a commercial system. Therefore, additional financial resources would be needed for the adaptation of the layout, including changes to the navigation bar and the general look and feel according to the needs identified previously. At least the colours and font of the system could be customised to the corporate design of the University of

Vienna. Since financial resources are limited, the commercial system remained unchanged to a large extent.

Another limitation in the adaptation of an existing terminological database to usability principles are the available resources devoted to terminology work per se and the maintenance of the terminological database, in particular. As mentioned above, the usefulness and the quality of the content of the terminological database can also be aspects of terminological usability. Therefore, terminological entries should be updated and expanded regularly to be truly useful for the users. The engagement of users in terminology work themselves can be an option to increase this usefulness.

A feedback option has two principal advantages. On the one hand, a feedback option for users is crucial for the quality assurance of the terminology provided and the enlargement of the terminological database. On the other hand, users can actively participate in terminology work and in the development of the University's terminological database. They can express their terminological needs. Furthermore, being able to actively contribute to the development of the terminological database may increase the motivation and commitment of university employees (Author 1). In addition, social features, such as terminology quizzes, can raise the interest in terminology among the users. Future studies may therefore investigate if there is empirical evidence for an increased interest and motivation among different UniVieTerm user groups resulting from these features.

Terminology work is steeped in tradition at the University of Vienna. The University of Vienna is closely related to Eugen Wüster (Wüster, 1979), the founder of terminology (Budin, 2018), whose principles of terminology work are also reflected in ISO standards (e.g. ISO 704 – Terminology work – Principles and Methods. By adhering to standards of terminology, including TBX (TermBase eXchange, ISO 30042), the interoperability of the data in UniVieTerm should be guaranteed as far as possible.

Some decisions for the sake of usability in UniVieTerm required deviations from terminological principles as specified in ISO standards on terminology management. These decisions, as explained above, ranged from 'not being too terminological', such as the use of general language instead of specialised language in the user interface, the way of presenting definitions and the number of definitions provided. Moreover, the introduction of new data categories for semi-prescriptive terminology work also results in problems of data interoperability. The data in UniVieTerm can therefore only be re-used according to terminology standards after manual processing. Nevertheless, user needs are of the utmost importance and user-centred design can shape the look and feel and the content of a terminological database.

Although these decisions might be considered a violation of ISO standards on terminology management, they are in line with (Cabré, 1999, p. 130), who states that "all terminological work defines the end-user". According to this statement, the specific

situation and the group of users define the way terminology work is conducted and the terminological database designed.

The platform Kalcium does not only allow for the definition of user groups who have different permissions and the definition of terminology workflows but also for the creation and visualisation of concept systems. Therefore, future steps include the integration and further development of the preliminary concept systems generated together with domain experts and/or the terminology network at the University. These concept systems should further facilitate the transfer and acquisition of specialised knowledge by different user groups.

7 Conclusion

The UniVieTerm terminological database aims to be the main terminological resource for different user groups, while the employees of the University of Vienna are the main target group. This aim required adaptations of both the terminological database design and the content to meet the users' needs. However, striking a balance between terminological principles and usability principles demanded several compromises.

UniVieTerm should serve different purposes and be flexible enough to cater for the needs of different user groups. This includes user groups that are currently not addressed, such as technical writers, teachers (of languages for special purposes or of special subjects), language planners or academics.

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