Profile of a Terminologist in Localization Environments

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Abstract

Terminology as a subject for research has been around for centuries. Even terminology-related tasks have been carried out for many years. The profession of terminologist in the localization industry has been emerging and taken on a more distinct profile, as localization is maturing as an industry. This paper defines the profile of a terminologist in the localization industry. First, it sets important definitions, and then describes terminology work as an essential ingredient in the localization process, and conceptual analysis, in turn, as the essence of successful terminology work. It then gives examples of companies that employ terminologists and concludes by juxtaposing seemingly contradictory characteristics and skills of multilingual terminologists in localization settings.
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Multilingual technical communication has greatly increased in volume over the last two decades, most notably in the computer industry. Initially, software designed for the English-language markets was translated at least into languages, such as German and Japanese. But economic globalization, technical advances and saturation of existing markets encouraged software producers to open up new language markets. In recent years, the volume of translation from languages other than English into languages other than English has increased as well (Beninatto, 2008). As a result, software companies looked for ways to improve output quality and speed of the localization process.

Standardized terminology is the backbone of a quality-driven translation process. In a recent survey of 194 translation professionals, 87 percent confirmed that “having a terminology management process clearly improves the productivity” and 82 percent said “the time taken to research terms was their biggest difficulty” (SDL, 2009). While smaller and one-time localization endeavors can make due with a simple terminology list or spreadsheet, companies with an extremely high translation volume and a large number of languages invest in and maintain sophisticated terminology management systems (TMSs). And while most of the localization work is carried out across the globe by freelance translators, these companies have at least a few trained terminologists on staff. They influence and document standardization decisions, research and author definitions, drive the term creation process and explicate conceptual systems. The resulting information is documented in electronic records of terminology databases where it is accessible to all users in real time and online.

Like a lexicographical entry in a paper dictionary, a terminological entry is only as good as the information it contains. Apart from being as up-to-date as possible and complete by itself, an
entry must also be in line with its conceptual system—whether that system is made explicit in the TMS or not—as the terminology database is only as sustainable as the ontology formed by these conceptual entries. Terminology databases fail for three main reasons. First, if too many duplicates remain undiscovered, they will confuse users and clutter the database. Second, if conceptual entries are not “clean”, for instance, if universals and particulars are mixed up, users will not be able to make clear connections between concepts and again will end up confused. Third, if concepts are not based in or checked against reality. If accurate and complete entries placed in their concept system are the mandate, terminologists must be capable of finding and documenting that information. This simple demand translates into the profile of highly skilled professionals.

Who can fill such a role? This paper attempts to define the profile of a terminologist. First, it sets some definitions, and then describes terminology work as an essential ingredient in the translation process, and ontology work, in turn, as the essence of successful terminology work. It then gives examples of companies that employ terminologists and concludes by juxtaposing seemingly contradictory characteristics and skills of multilingual terminologists in localization settings.

**Definitions**

When computer scientists, business managers, terminologists and philosophers discuss terminology management, ontology, and related subjects, a fair amount of miscommunication occurs because there is little common understanding of the terms and concepts of these adjacent fields. Ontology, and even terminology projects, can only succeed if project participants, such as
engineers, project managers, terminologists, and their sponsoring management, speak the same language.

The terminology of terminology is fairly well standardized, and progress has been made to define and agree on ontology terminology. For example, the NeOn consortium is actively defining ontology terminology for activities in ontology creation. The current glossary contains approximately 60 definitions and is available through the NeOn Web site (NeOn consortium 2008). Furthermore, ISO TC 37 created an ontology task force in 2007, which has as one of its goals the creation of an ontology of ontologies, including definitions (Nistrup Madsen, 2008).

This paper draws on definitions set forth, for example, in ISO 1087 for the terminology field, as well as on definitions created and used by ontologists (e.g. Smith, 2006).

At the core of a terminology, but also an ontology system, is the “stuff” that is described, documented, named, and connected to other “stuff.” In terminology management, one unit of this “stuff” is referred to as a concept. This term is used throughout this paper in the same sense as Smith defines entity, that is, “anything which exists, including objects, processes, qualities and states” (Smith, 2006). As shown in Figure 1, in a terminology database concepts are represented by unique IDs. To facilitate communication, they are also represented by definitions.
Furthermore, concepts are represented by terms, appellations or symbols. In a terminology database, each such designator has its own terminological entry (“part of a terminological data collection […] which contains the terminological data […] related to one concept” (ISO 1087-1, 2000)). Terms representing the concept, such as the one described in Figure 1, in the same language are listed as synonyms with their own entries (see Figure 2), and terms representing the concept in another language are listed as equivalents.

A visual representation of the terms concept, taxonomy, concept system, and formalized ontology may foster understanding. In Figure 3 illustration 1, the semiotic triangle (ISO 704,
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2000) is used to represent a concept by itself. In the second illustration, several concepts are connected through generic relations; they form a taxonomy. Figure 3 shows concepts connected by multiple types of relations, for example, generic and partitive. These two types of relations are frequently the only ones used in TMSs. The difference between illustration 3 and 4 is that the relations may not be formalized or not even made explicit (here shown by the dashed line style). And yet they do exist between the concepts represented in a terminology database. Ideally, they are made explicit and even formalized, as indicated by the full lines in illustration 4, for example, to support the research for other languages, who will also attach their representations (e.g. in the form of terms) to the entry – here indicated by the arrows.

Figure 3. Visual representations of a concept (1), a concept hierarchy (taxonomy) (2), a concept system with implicit relations (3), and a concept system with explicit relations as well as multilingual representations (4)

Terminology Work: The Backbone of the Translation Process

Like most professions in the last three decades, the profession of a translator has changed significantly. Gone are the days of the typewriter and the need to live close to a library and one’s customers. Today, ten localizers receive text chunks through e-mail, work in networked, virtual...
environments that may even include subject-matter experts (SMEs), and hand back the finished files for compilation and publication as part of online help, a Web site, a printed document, or some other medium. While working methods have changed, consumers of localized software products have shifted their expectations, too. Sometimes they are satisfied to find information in their language at all, no matter the quality of the text. At minimum, when a functional or content-focused text, such as online help, is translated by a human being, the target language text must relay the information of the source text fully and free of errors (Reiß, 1986).

“Terminology is the primary means of communication and knowledge transfer between software developers and end users” (Schmitz, 2007). Terms and concepts must not only be used consistently, correctly, and unambiguously in the original document for the users of a source language product, users who buy translated products are also entitled to the same clarity and usability. To achieve clarity in the target language product and enable efficient use, translators must understand the ideas of a source text, the meaning of terms, and the relation between them. This is not always easy for a variety of reasons.

From the development of a new function to its representation in a target language, dozens of people may be involved. In a long chain of contributors, much of the original meaning of a concept may get lost by the time localizers see the first instance of a term in a text. If we take a prominent example such as the Ribbon, which was a new feature in all Microsoft® Office 2007 products, designers had an idea, developers implemented it, and content publishers wrote about it. They all had at least a vague notion of what the Ribbon was at the time they communicated about the concept. Microsoft localization project managers handed off the result of their communication, for example software files or user-assistance documents, to a vendor project.
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manager. They, in turn, distributed them to a number of freelance translators. A translator halfway around the world in their home office is then tasked with finding an appropriate term to express the meaning of Ribbon in a specific language. If the freelance translator does not see the implementation of the Ribbon (see Figure 4) or get an explanation of it—for example, in the form of an entry in a terminology database—the translator may not be able to find a better term than a literal translation or may decide to leave it in English. High-profile terms, such as Ribbon, generally receive enough attention by marketing in all relevant language markets that the meaning, as well as the preferred target name, is communicated even without a terminology database. But most technical terms do not receive this special and expensive attention, and without proper treatment in a terminology database they may end up being mistranslated.

Figure 4. The Ribbon as displayed in Word 2007

In certain translation scenarios, translators may only get a glimpse into the world of the source text author. For example, if translation tools are poorly designed, translators may only see one string at a time. Figure 5 shows a screen print of the first translation tool used in the mid-90s at J.D. Edwards. The localizer is asked to translate the string “Swing” from English into German and arrived at the equivalent “Spätschicht,” which seems plausible for business software. But without context, the localizer either arrived at the translation through guess work or spent time to identify the meaning by extensive research. The fact that the Word Book Reference Language entry: “Auffahrt” in the upper portion of the screen is outright wrong certainly did not help.
Figure 5. Translation software used at J.D. Edwards in the mid-90s

While a terminology database cannot eliminate additional, context-dependant research on the translators’ part 100 percent of the time, database entries can clarify the meaning of a term, provide contexts and indicate product information, and therefore greatly reduce the research time invested by translators. Furthermore, a terminology database can ensure that a team of several translators uses the same term for the same concept to produce a standardized text. The benefit of consistent terminology within a software product or between different interdependent products (such as Microsoft Office running on the Microsoft Windows® operating system) is easy to recognize.

Although a unit of translation (such as “Swing” in Figure 5) can be at the same time the term described and defined in a terminology database, translators and terminologists treat the
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unit differently. A translator works in context and arrives at a target solution that is correct in that text. Eco says “in light of the full spectrum of meanings made available by a dictionary entry and its applicable encyclopedic information, the translator must choose the most probable, reasonable and relevant sense for the context in question and this possible world” (Eco, 2003). The translator makes a decision for a term in a context, and the translated text becomes part of history.

Terminologists, on the other hand, must create terminological entries that are applicable in more than one situation or context, that can be comprehended by people other than the terminologist and that reflect terms used by the expert users (see Cabré, 1999). These entries are the static representations of concepts and terms in a dynamic world: Things evolve and new concepts come about; they, too, must be entered into the concept system. Terms representing these concepts are being created; they may be coined by a small circle of experts at first, entered in and standardized through a database, adopted or rejected by the community, but quickly superseded by new terms; these, too, must be added to the database (see Budin, 1996). For example, when the Office Fluent Ribbon was first created, the superordinate concept “ribbon” had not received much attention. But users and designers liked the idea, and new types of ribbons have since been created in other software programs (e.g. Windows Scenic Ribbon) and consequently made explicit in Term Studio.

If a term or definition does not stand the test against this dynamic real world—for example, if it is erroneous or simply the limited view of one person at one point in time—it invariably leads to errors. First, other, dependant entries, such as target language entries, may be affected.

If an error in a target terminology entry remains unrecognized, a translator may use it and the

1 Unauthorized translation by the author.
translation text will contain the error. The error might be propagated into other translation projects through the use of translation memory. In a very short period of time, a small inaccuracy in one entry could lead to an error in translated documents for multiple products. This would not only mean problems for product users, it would offset the return on investment (ROI) of terminology management. It is therefore of utmost importance that a complex terminology system be set up and maintained by experts who keep incorrect data to a minimum. As Cabré (1999) puts it, “terminologists should be the only professionals who actually write terminologies.”

The Terminology Process

How do terminologists arrive at sound entries that make up a correct and sustainable concept system? Data acquisition, “the process of collecting, entering, and storing data into a data processing system” (ISO 1087-2, 2000), most often starts with term extraction of source terms from one particular context. In large scale localization settings, this process is automated. The job of the terminologist, along with SMEs, is to identify valuable terms from a list of term candidates. Once a term is identified, it must be researched in other contexts. Good terminology extraction tools facilitate this process by making a variety of contexts from a variety of sources available. Furthermore, the term must be checked against existing entries in the terminology database; this, too, can be partially automated. In some cases, a more or less extensive conversation with experts about the concept and its characteristics is necessary. This research and data validation phase must also include finding superordinates and related concepts in order to avoid duplicate entries, false definitions, or other errors. Because the researcher has to identify these relations to arrive at sound entries that have certain longevity, explicating the
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relations is only a matter of having the right tools functionality. Formalization and visualization of the ontology can thus be considered a byproduct of the research process that, if set up properly, can serve multiple purposes: Assist in the research of target terminology, serve as training material, facilitate search mechanisms, etc. Figure 6 shows a simple visual representation of a concept system in a terminology database in which the only goal was to support the target research process.

Figure 6. Visualization of a concept system for forecasting concepts in the J.D. Edwards terminology database

While this process is taking place and various data is added to the source language entry, the target term research begins. However, the target terminology process must not be concluded,
until the expert community has signed off on the definition and the conceptual and source
terminology entry are correct and complete. If these steps are inverted, change management can
become complicated. This process can take minutes, but it can also stretch out over months. At
any given point in time, a localizer must be able to retrieve what is known and available in the
system to make use of the data. Data reliability is generally indicated through the available
metadata and approval statuses.

**Terminologists in the Localization Industry**

In their prediction for 2008, Common Sense Advisory, Inc., a research and consulting firm,
expected an increase in the number of full-time terminologists in the industry beyond companies
who have had terminologists on staff for many years (De Palma, 2007). In December 2008, De
Palma (2008) admitted that their prediction was off. But most companies that have a high
localization volume, deal with technically difficult, highly specialized terminology, or outsource
to a multitude of vendors with different backgrounds have terminologists on staff. The following
major computer companies were examined for this paper: SAP, IBM, Oracle, Microsoft and J.D.
Edwards.

SAP has been investing in centralized terminology management the longest of the five
companies. Since the early 90s, they have had a core team in charge of building up *SAPterm*,
which is one of the largest terminology databases in the industry. According to coordinator for
terminology issues, Mark Childress (2008), all writers and translators are responsible for
terminology work as part of their tasks. Most of the product teams use the SAP board’s
recommendation to invest one half-day per person per week in term work, on average. By
Childress’s calculation, that results in 38 full-time terminologist-equivalents for the two source
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languages, English and German. The vast majority of target terminology work is outsourced to translation vendors and reviewed by an in-house staff. His team of five, plus one student intern, is providing training, database maintenance, standards and processes.

The IBM structure is slightly more discreet. The team has one person to oversee the global terminology strategy, Kara Warburton, who is joined by one terminologist in charge of the source language (English), one terminologist focusing on English glossary development and management (definitions, etc.), one terminologist in charge of the English term extraction process and one part-time helper for English terminology. Furthermore, the team has one three-quarter-time project manager of terminology in the target languages and two terminology administrators in charge of importing bilingual files. There are also part-time terminologists for each of approximately 30 target languages who are focused on terminology work for a portion of their time and serve as translation project managers and translators the rest of the time (Warburton, 2008).

No staff at Oracle is solely dedicated to terminology work according to Helle Katic, Senior Process Manager on the Oracle WPTG Translation Support Team (Katic, 2008). Two employees have the discretionary title of terminologist, and some of their tasks are terminology-related. Furthermore, some of Oracle’s language specialists have the role of product specialists. In that capacity, they do source terminology work on the products within their area. Likewise, language specialists do a varying degree of terminology work pertaining to their specific language. The network of language specialists consists of one or more language specialists located in the countries where translated products are marketed.
When this paper was originally delivered at Philosophy and Informatics in Fall 2008, Microsoft had five terminologists for the source language English, two full-time terminologists for Japanese, two part-time terminologists for German, and one full-time terminologist each for Brazilian-Portuguese, French, Italian, Korean, Spanish, Simplified and Traditional Chinese. Furthermore, there were dedicated vendors for 28 other languages and a team of three linguistic engineers. In spring of 2009, the terminology model was turned into a decentralized system for target languages. That means that the five source terminologists are still full-time employees, but that target terminologists are no longer available in a central team. Any product team must now hire external terminologists, who are then charged with researching and documenting target terminology.

Almost all of the localization needs of J.D. Edwards were met through an in-house team, which was established in the early 90s and existed until 2004, when the company was acquired by PeopleSoft. In 1998, a group of seven full-time terminologists grew out of the localization teams. They worked part-time on English terminology and part-time, and in cooperation with their translators, on terminology for the following tier-1 languages: Brazilian-Portuguese, French, German, Italian, Japanese, Simplified Chinese, and Spanish. All in-house translators for the tier-2 languages served as part-time terminologists documenting terms in the remaining 14 languages (see Karsch, 2002). This model was successful because knowledge sharing was possible, no complex handoff structures with vendors slowed down the process, and automated terminology workflow facilitated the complex data acquisition and entry negotiation process between stakeholders on site and in the subsidiaries abroad.
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The details of the processes and the complexity of the TMSs used in these companies may vary. One may be based on a quantitative approach; another has a high focus on customer satisfaction. One may have more access to SMEs; another less or not at all. One may be able to halt the localization process if no terms were documented; another may be completely at the mercy of the product teams. And yet, any of these environments require seemingly contradictory skills, characteristics and talents that translate into the rather complex profile of a terminologist. In the next section, each paragraph juxtaposes two such qualities that the author has found to be critical in her work as a terminologist for English and German first at J.D. Edwards and since 2004 at Microsoft.

Subject-Matter Expert vs. Generalist

Terminology management requires both subject-matter expertise and terminology management know-how. Many different practitioners have been involved in the field of terminology management. Engel and Picht (1999) distinguish two groups: On the one hand, there are the SMEs who engage in organizing the concepts and terms in their field. On the other hand and much more frequently, the localization industry attracts linguists who are not specialized in a subject matter, but are generalists and terminology management experts. They must be able to work with SMEs and get into a subject-matter area at the spur of the moment. For example, as part of the research for Axapta 5.0, a business software product from Microsoft, the terminologist dealt with terms such as MICR line, a line of characters that is encoded on bank checks with a special type of ink that can be magnetized and then translated into characters. Within the same week in the framework of the developer product, Visual Studio 2008, she dealt
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with *thunk* (“A small section of code that performs a translation or conversion during a call or indirection…”). If terminologists work in teams, they can complement each other’s strengths.

On the German localization team at J.D. Edwards, a certified accountant, a native Swiss with solid linguistic skills, was in charge of research and documentation of the financial terminology for German. His subject-matter expertise was rounded out by the terminology-management skills of the full-time terminologist.

**Researcher vs. Negotiator**

A terminologist must be able to shift quickly from focused research work to agile leadership of negotiations. Terminologists, like translators, must have excellent research skills and be informed about research material, resources, and experts; i.e. they must stay abreast of the subject-matter fields they work in. Furthermore, they must decide swiftly which resource is to be drawn on for a particular term. Research work is characterized by focus and attention to detail and at least partially carried out in a more solitary environment. Negotiations that may go along with determining the term for a particular concept, on the other hand, require a highly interactive work mode. Ideally, the terminologist leads or facilitates the negotiations between different stakeholders (see Figure 7), the outcome of which is documented in the database. This means that terminologists carry out thorough investigations first, and then, when necessary, switch into negotiation mode with their circle of experts.
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*Figure 7. The terminologist as the negotiator among stakeholders*

‘Fingerspitzengefühl’ vs. Thick Skin

Research and negotiations not only call for the ability to work in different modes, but they also require sensitivity and thick skin. Term research or creation requires what is referred to as *Fingerspitzengefühl* in German, i.e., the accurate evaluation of resources, the meticulous creation of neologisms, and the careful guidance of the experts involved. If accuracy, precision, and sensitivity drive the research and design aspect of terminologists’ daily tasks, they must be thick-skinned in others. Language as a communication vehicle that is close to every human being is also one that is criticized quickly. Because terminologists generally have to make dozens of decisions each day, some of their choices are inadequate. Criticism is not always geared towards finding better solutions, but critical remarks could be instinctual reactions from humans, who are by default all experts in language. One important counterbalance to the sensitive creativity of a terminologist is the filter for inadvertent or deliberate disapproval.
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Self-critical vs. Assertive Behavior

Critiques from others can be extremely helpful, but only work if the terminologist is open to it. A healthy dose of self-evaluation of one’s terminological decisions is therefore advantageous. Reflection of one’s own work and the readiness to admit that one is not infallible seem juxtaposed to the assertiveness that it takes to negotiate with others who may be experts in their field, but not aware of term formation rules, of budget constraints in terminology change management, or the requirement of a term to work for different audiences. For example, at J.D. Edwards the German term for fiscal year was changed twice from Geschäftsjahr to Finanzjahr and back to Geschäftsjahr again, each time costing more money. When a terminologist was appointed, she determined that the difference is merely a personal preference by SMEs and insisted that the term not be reverted back to Finanzjahr, although a new financial expert preferred it.

Native-language vs. Foreign-language Expertise

Terminology management requires native language experts and a tremendous understanding of the foreign language nuances. Existing terminology must be thoroughly researched, existing synonyms must be carefully weighed, and new terms must be well motivated and created under consideration of target-language term formation rules. The level of knowledge it takes to work well with one’s native language is often underestimated, and yet, even the best linguists can only find good terms in their language if they are also well-versed in the nuances of the source language.
Linguistic and Technology Expertise

Linguistics and technology are two fields that are not necessarily complementary. More than a basic understanding in both is needed for a career as terminologist in the localization industry. Twenty years ago, applied linguistics or linguistics attracted students with an interest in literature and language. Database technology did not necessarily fit with that. Today, most terminologists have a good understanding of both, either because as pioneers in this field they have participated in the design, implementation, or training of terminology databases, or because the tools are still so complex that a terminologist must understand more than just how to enter data.

Organizer with a Tolerance for Chaos

By design, a terminologist is an organizer, and by definition where things need to be organized there is chaos. Even in the best-managed software projects language is not the number one priority. In a worst case scenario, software is handed off to localization and feature names or other terms are not final. The reason for this is that most software vendors are expected to ship source- and target-language versions at the same time. A terminologist can be caught in a project with not-yet-finalized terms, poorly defined concepts, conflicting definitions, or unclear concept relations. The systematic manner that a terminologist brings to the task can make a difference to the project, if the terminologist can live with temporary chaos.

Moving Quickly and Lasting Long

Sometimes a terminologist must act extremely swiftly, and at other times they must have the long-term in mind. Eliminating a mistake quickly, clarifying an ambiguous definition for a concept promptly, or taking the path of least resistance to get a term candidate approved can
make the difference for localization projects. Terminologists work with dozens of terms on a daily basis and must move quickly with decisions, find answers rapidly, and can’t waste time with faulty research approaches. And yet, on occasion they need to invest time for the future. A marketing team, for example, may need to have an explanation of term formation rules in order to approve a suggested term, or a writer may need an introduction to concept relations and hierarchies to rewrite a definition. These are investments in the future of working with teams and individuals that prepare the way for quicker decisions for the next project. Sometimes, they also need to outlast an engineer to get certain functionality integrated in the TMS.

**Quantity vs. Quality**

During a translator’s training, the emphasis is, with good reason, on quality work. In professional practice, quantity (which could be equated with on-time delivery of a job) is critical. As in many fields, the key is to deliver the highest possible quality on time. Some individuals are better in producing database entries that meet a set quality bar (e.g. the entry contains all mandatory data and is correct to the best of the terminologist’s knowledge). But they may struggle with the number of entries that need to be dealt with. Others can handle the volume, but their entries may lack data, contain confusing information, or contradict other entries. In reality, though, a terminologist has to be able to spend enough time on an entry to set it up correctly, provide all necessary information, and do this consistently enough to actually respond to the needs of the database users.

**Big Picture vs. Focus on Detail**

When the research work necessary to set up a terminological entry is very detail-oriented, explaining what terminologists do or enlisting management support requires big-picture thinking.
Because there may only be a few terminologists on the staff of a company, they have to be able to cover both. Understanding and documenting an obscure concept requires painstaking research; often, terminologists start out with their intuition which guides them into a certain direction; until hunches are proven wrong they follow the path to find enough confirmation to conclude the research. Often, a roadblock points in another direction and more evidence must be collected, until a concept or term can be documented with enough confidence. Because of the niche-nature of the profession, business reviews happen fairly frequently, and anyone on a small team may be called upon to explain to management why terminology work is important and why funding must continue. In these situations, a business manager does not want to hear about the successes of researching the murky concept as explained earlier. Many times, they want production numbers and cost savings. Unless a terminologist can get from the detail-level research world into the big-picture world of management, communication will not happen and funding may be cut.

**Theoretical Foundation vs. Pragmatic Action**

Finally, there is the necessity of a good theoretical basis and the need for quick pragmatic decision-making. Experienced terminologists combine both—they can solve new business problems to serve, for instance, the majority of users quickly. But they also base these decisions on the theory that must underlie most of their actions. Pragmatic behavior without the understanding of terminology theory can lead to short-lived database entries or ill-designed TMSs. A theoretical approach without common sense will have most terminologists drowning in work. There are still many aspects of terminology management that have not been dealt with in
literature, by ISO standards or at universities. But a good understanding of the theoretical underpinnings of terminology management is a prerequisite to a successful career in the field.

**Summary**

Complex localization scenarios rely heavily on terminology management. If ROI is to be maximized, systematic terminology management must be based on sound concept analysis and can have as a byproduct explicit and formalized ontologies. The prerequisites for success of such a terminology and potentially ontology system are not easily satisfied—processes, tools, and people must come together in a highly complex interplay.

*Figure 8.* Simple version of a complex system in which many people contribute and many people retrieve data

Figure 8 shows such a workflow, in which ideally many contributors, such as content publishers, SMEs, or user communities funnel their knowledge into a good TMS as soon as
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concepts and terms have reached a certain level of stability. Online or instructor-lead training can help enable this process, as can user-friendly input interfaces. Once entries have been created or amended, highly skilled terminology experts, who act as gatekeepers, retrieve this input. Besides their terminology processing expertise, they rely on automated processes to check validity of the information and then approve or reject entries. Once released, entries should be made available to as many users as possible. Not only does this warrant a high degree of standardized usage, it also allows for the user community to act as quality assurance. Because humans will always make mistakes even with the assistance of the most sophisticated automated processes, feedback mechanisms are vital in increasing the value of the terminology asset.

The skills it takes to set up correct entries, to keep the conceptual system sustainable, and to maintain a terminology database are manifold. Not all of the described scenarios will come up every day. Simple scenarios can be dealt with using simple solutions—a spreadsheet and one owner who collects and maintains data and distributes it back to the users. But in environments with many products and many domains, multiple languages, virtual teams, and complex tool usage, terminologists have to live up to the challenges described in this paper on a daily basis. The better equipped they are through their educational background and experience, the more successful they and the TMS will be.

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