# Follow @ TermList on Twitter! — Social Media as a Tool for Terminological Information and Activities

# ANITA NUOPPONEN

University of Vaasa

**KEYWORDS**: terminological activities, social media, computer-mediated communication, content sharing, online collaboration

# 1. INTRODUCTION

Terminology science and terminology work have always had a very strong emphasis on networking, collaborating, and sharing information as well as on utilizing and developing computer software for various activities of the field. This paper integrates two research interests of the author: terminology and computer mediated communication (CMC), and belongs to a series of papers where the adaption of CMC technologies for terminology work and dissemination of terminological information have been reviewed<sup>1</sup>. The following citation is from Nuopponen 1996 presented at the TKE conference in Vienna:

"The Web is an ideal platform for various kinds of terminological activities. It is <u>not only</u> an online archive or storage for electronic documents or a world-wide bibliography or encyclopedia of terminological and terminographical information but it can play an important role as an interactive collaborative communication tool in terminological research, terminographical projects, as well as in education. Even though there are already plenty of terminological activities in the Web, the major part is still missing — hopefully not very long." (Nuopponen 1996)

Most of the major actors in terminological information dissemination and coordination, such as Infoterm and TermNet and national terminology centres were still missing on the web — a fact that may seem hard to understand today. However, the obvious reason for it was that the World

<sup>1 &</sup>quot;Terminological information" refers to information related to terms and concepts, terminological products, methods, theories, research and other activities etc.

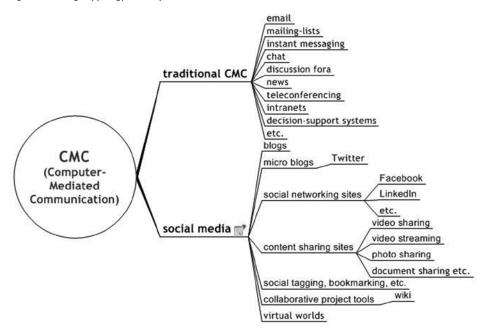
Wide Web was still brand new back then, and the first easy-to-use web browsers appeared around 1993. The Internet opened for commercial use as late as around 1991–1993, the years 1994–1995 being the breakthrough years. At the University of Vaasa, we had been following the development of the Internet from the late 1980's, and 1994 I established *Term-List* mailing-list and *Terminology Forum* web portal for terminology related information.

Since then, more tools for online interaction and information dissemination have become available, the latest being social media, the use of which has spread to almost any field of human activity. In Andreas Kaplan's and Michael Haenlein's (2010) words, social media could actually "be seen as an evolution back to the Internet's roots, since it retransforms the World Wide Web to what it was initially created for: a platform to facilitate information exchange between users". It is time for the next review of the situation. This article discusses how the terminologists utilize or could utilize the Internet and more specifically social media for terminological activities and for dissemination of terminological information today. The four affordances of social media presented by Jeffrey W. Treem and Paul M. Leonardi (2012) who discuss the kinds of behaviors social media supports are taken as a theoretical framework. Only those social media sites or applications are taken under scrutiny where terminological information, content or activities could be found.

# 2. SOCIAL MEDIA

Since the concept of social media is evolving its definition is hard to pin down. Often authors resort to give an extensional definition by enumerating "the types of technologies that people recognize, implicitly, as social media (e.g. *blogs, wikis, Social Networking Sites, social tagging*, etc.)" as Treem and Leonardi (2012: 145) point out in their analysis of previous social media studies. In Figure 1, there is a tentative typology of the types of social media. It is difficult to outline a concept system for social media because the software and services or technologies are constantly being developed and morphed into something new. For instance, in the beginning *Twitter* was associated with blogs, but now it is used for news sharing, social bookmarking, and it is competing with social networking sites such as *Facebook* and *Google*+.

Figure 1. A rough typology of computer mediated communication



Intensional definitions for the concept of social media quite often emphasize features such as online existence, content creation by the users, displaying the content to others, sharing, and interactivity. These characteristics, however, do not yet distinguish social media adequately from the *traditional CMC* (see Figure 1) (Treem, Leonardi 2012: 145). Email, mailing-lists etc. have many of these features. In addition to the generally mentioned characteristics of social media Treem and Leonardi (2012) emphasize the kinds of behaviors social media typically afford — what we can do with these tools. As affordances they list:

- visibility (contributions can be easily located and viewed),
- **persistence** (social media maintains the compiled knowledge over time),
- editability (messages can be carefully crafted prior to sending),
- **association** (between individuals, between individuals and content or between an actor and a presentation, content and content).

Treem and Leonardi (2012: 148–150) note that these affordances apply also to the traditional CMC and other types of communication technologies utilized in organizations. The difference is that social media technologies have potential to have high levels of <u>all</u> of these affordances simultaneously.

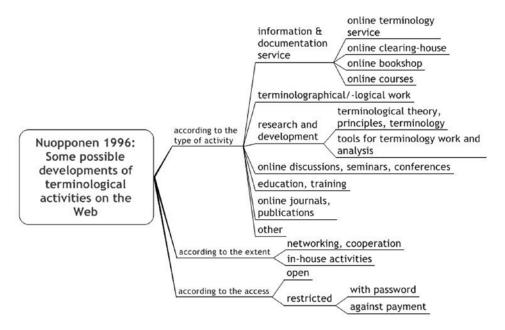
(Ibid.) For instance, emails can be crafted carefully and stored and searched, however, they have limited visibility. Furthermore, the sender cannot edit or remove sent message. A database entry may have visibility but it may lack association, e.g. discussion between those who are editing the entry.

Even though Treem and Leonardi (2012) are talking about organizational settings, much of what they say applies also to communication inside a discipline, in this case the field of terminology. In the following, today's terminological activities online and possibilities that social media offer for this field will be discussed.

# 3. TERMINOLOGICAL ACTIVITIES ONLINE

In Nuopponen 1996, the future of terminological activities on the web was outlined as shown in Figure 2.

Figure 2. Some possible developments of terminological activities on the Web (Nuopponen 1996)



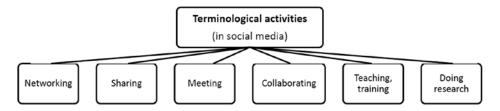
Until then, great efforts were put into compiling bibliographies and disseminating information on printed terminological products. Today, the future predicted in the paper, is quite accurate, because the web is now utilized for all of these, e.g. printed bibliographies have been replaced by online listings of publications and we have direct access to vast amount

of relevant texts and documents. Search engines, link lists, home pages and social networking sites have made printed *who* is *who* publications redundant and antiquated.

# 4. TERMINOLOGICAL ACTIVITIES IN SOCIAL MEDIA

Various terminology-related activities in social media have been searched for in order to find a pattern for what is done and what could be done. Seen from the perspective of social media, terminological activities can be divided roughly into networking, sharing, meeting, collaborating, teaching and training, and doing research (Figure 3). Each of these has its own requirements and there is no single social media site, platform or application that would serve them all.

Figure 3. Terminological activities in social media



# 4.1. Networking

Networking refers here both to (1) finding the right persons and organizations to connect with, and to (2) reconnecting and keeping in touch as well as to discussing common interests. Social networking sites (SNS) such as *LinkedIn* and *Facebook*<sup>2</sup>, enable the users to find those that they already know and to connect with them, to see who is connected with whom and who does what. Indeed, there is already a large network of terminology researchers and terminologists to be found in *LinkedIn*. Earlier, finding this information and building a professional network required frequent participation in terminological events, correspondence and email exchange. On a SNS, the information is easy to edit and does not disappear as easily as business cards after a conference.

Seen from the other angle, SNS affords visibility for the users. Treem and Leonardi (2012) say that "social media afford users the ability to make

Other popular social networking sites are Google+, Orkut (popular in India, Brazil), SinaWeibo (China), Vkontakte (Russia). See more, e.g. http://en.wikipedia.org/wiki/List\_of\_social\_networking\_websites.

their behaviors, knowledge, preferences, and communication network connections that were once invisible (or at least very hard to see) visible to others". Especially <code>LinkedIn</code> (linkedin.com), which is more professionally oriented than <code>Facebook</code> (facebook.com) has become commonplace to link with people we meet at conferences and meetings. Instead of exchanging business cards we may say "you can find me in <code>LinkedIn</code>" or send invitations to people we have met and to connect with them. The user profile in <code>LinkedIn</code> could also be characterized as a dynamic and interactive CV since the users can update their data and connections may endorse the skills and write recommendations. The users post status updates and follow each other's messages. In addition, the sites themselves analyze users' data and existing contacts, and recommend new connections or content, which may or may not be relevant.

Compared to social media, discussions in email or on a mailing-list have limited visibility. Social media give also the possibility to edit messages carefully, to delete already submitted messages, to address a larger group without messing up the mailboxes, to search and access messages later on, etc. (Treem, Leonardi 2012: 148) A SNS site like *LinkedIn* provides people with various kind of information which also a home page may do, but SNS sites are normally more dynamic and facilitate interaction: endorsing connections, sending messages, sharing news or other content, joining groups with special interests and discussing in these groups.

In traditional CMC discussions, opinions, and comments have been conducted and expressed as email messages, mailing-list conversations or synchronous or asynchronous online chat. Email-based tools are limited to their visibility, only those to whom the message is send get it. A downside is that mailboxes get easily filled with lengthy conversations. Instead, social media sites could be utilized more for discussion enabling thus more people to join it. For instance in *LinkedIn*, it is possible to create discussion groups or join an existing one. For terminologists, there are especially two groups: *Terminology*, managed by Kara Warburton, and its subgroup for *Association for Terminology and Knowledge Transfer* managed by Hanne Erdman Thomsen. Utilizing possibilities like this is not without problems either since it is easy to forget being a member in a group unless email notifications have been turned on. Email has become a tool that is being used on a daily bases, but SNS sites have not necessarily gained the same degree of presence in our daily lives.

# 4.2. Sharing

One of the most typical features of social media is sharing — sharing content and meta-knowledge. In the field of terminology, the content could be texts, publications, articles, slideshows, terminological products, software, video recordings from courses etc. Meta-knowledge here means information on where to find shared content, links, news and reviews etc. Email, websites, email newsletters, online journals and online bookstores and data bases, have made sharing and finding content easier and faster. Social media enhance this set of tools, e.g. blogs, wiki, social tagging, content sharing sites for videos, texts, photos.

Blogs are useful tools for sharing thoughts, ideas and opinions with each other<sup>3</sup>. They may have a possibility for the readers to join the conversation and to share posts to other social media channels. Good examples from the field of terminology are BIK Terminology<sup>4</sup> by Barbara Inge Karsch, Terminology Blog by TermNet<sup>5</sup>, TNCs blogg (in Swedish) by The Swedish Centre for Terminology<sup>6</sup> and the *Blog* of European Parliament's Terminology Coordination<sup>7</sup>. Also many companies have interesting terminology related blogs: e.g. Microsoft<sup>8</sup> and SAP<sup>9</sup> have blogs with discussion possibilities for their customers, translators and localizers. Blogs may over time become huge repositories of information as has happened with TermCoord's original blog<sup>10</sup>, which was transformed into a website.

Link lists on websites are still popular for sharing meta-knowledge (e.g. Terminology Forum<sup>11</sup>). Social media offers further options, e.g. Pinterest, Scoop.it. Pinterest is a very popular social media site used for sharing ("pinning") beautiful photos found anywhere on the web. In her article "Pinterest as a library marketing and information literacy tool", Cynthia Dudenhoffer (2012: 328) describes *Pinterest* in the following way:

```
More e.g. Kaplan, Haenlein 2010
```

<sup>4</sup> http://bikterminology.com

<sup>&</sup>lt;sup>5</sup> http://terminologyblog.wordpress. com

http://www.tnc.se/TNCs-blogg

http://termcoord.eu/ blog

http://blogs.technet.com/b/terminology

http://scn.sap.com/community/globalization

http://termcoord.wordpress.com

http://www.uva.fi/termino

"Pinterest allows members to "pin" items or images found on the Internet to a "pinboard," which can then be easily shared through an e-mail link or by following the creator. The boards are publicly viewable so no login is required, and the boards can be constantly updated. This type of tool lends itself very well to sharing information to visual learners and traditionalists alike, and can be maintained by library staff quickly and easily. Library faculty can also use Pinterest to create "research portals," or visual representations of ideas used to kick off the research and writing process."

Some terminologists have been experimenting with same kind of usage for terminology, e.g. Terminology Forum<sup>12</sup> has *Pinterest* boards for *Term banks* with links to term bank websites, *Terminological literature* with book covers of terminological literature from sites where they can be purchased or downloaded from, and so on (see Figure 4). Others may share the findings, like or comment them. *Scoop.it* is similar to *Pinterest* but more text oriented (see e.g. http://www.scoop.it/u/terminology-forum). These could be described also as social content curation sites, where the users aggregate (links to) existing content according to their interests and share their findings with their followers.

Terminology Forum
The Pinterest extension of Terminology Forum and Terminology Forum and Terminology Internative, old and the Committee of the

Figure 4. Pinterest boards of Terminology Forum

<sup>12</sup> http://www.pinterest.com/termlist

**News sharing** could be taken as a separate category of sharing. Introduction of email, mailing-lists, email newsletters, and websites made spreading and acquiring e.g. event information easier. For a while an effort was made to compile event information on the Terminology Forum portal, but the idea was soon abandoned, because finding the information and editing webpages took too much effort and could not be done regularly. Today, Twitter and mobile devices (phone/tablet) offered a better solution: it is easy to follow tweets of other users who are interested in terminology related events and content and (re)tweet the information to the followers. It is a fast way to send and forward information on various terminological events (see Figure 5). Mobile applications have brought social media in mobile phones and tablets where the social media news feeds and messages can be easily accessed whenever we have some extra time.

Figure 5. Results of the *Twitter* search *terminology* (8.11.2013)



Also Facebook is utilized by organizations to publish news. Twitter affords better visibility, because in addition to the followers, anybody can find the message through a search of a word (e.g. terminology), "hashtag" (#terminology), or user (@termlist). Facebook is geared towards association between users while in Twitter the strongest association is often between the sender and the content. Some of the most relevant twitterers to be followed for those interested in terminological news and events are Uwe-Muegge, Rodolfo Maslias, TermCoord, TermNet and TermList.

# 4.3. Meeting, events, education and training

Social media (e.g. Twitter, Facebook, a blog) is often used not only to advertise for coming conferences (see Figure 5), but also during the conference. It is usual that some participants (see Figure 5: TAUS; Kaleidoscope) and some of the organizers are live blogging or tweeting during the event and quoting the presentations (see Figure 5: #tekom). Another possibility is to stream the event or parts of it so that the participant may follow, comment (e.g. in chat) or even give presentations online. A distinction can be made between webcasts and webinars (online seminars). Webcasts are more or less one way communication while webinars apply interactive elements of webconferencing software (e.g. *Adobe Pro Connect*, *Skype*, etc.) allowing the presenter and the audience to interact. Webinars, video (e.g. Youtube.com, Vimeo.com) and slide sharing (e.g. www.Slideshare.net), are utilized in various kinds of educational and training purposes. TermNet organizes ECQA Certified Terminology Manager courses partly as webinars (http://www.termnet.org). Also some translation and localization businesses organize webinars on terminological topics. For university courses, it is purposeful to utilize e-learning platforms since universities usually have made a platform (e.g. Moodle, Blackboard) available to their personnel and students. These platforms include various types of communication and content sharing tools familiar from social media.

# 4.4. Collaboration

Terminology projects and terminology management involve various types of interaction, information transfer, and communication e.g. messages, meetings, storing and sending material, commenting, editing, reviewing, publishing, and promoting. These have traditionally required various tools to perform. Many of the problems could be solved with social media or by integrating interactive elements in collaborative platforms, such as offered by wiki technology.

Basically wiki technology is "an open source collaborative server technology that enables users to access, browse, and edit hypertext pages in a real-time context" (Leuf, Cunningham 2001: 442). There are several extensions of wiki technology, e.g. Semantic MediaWiki, which makes the data machine-readable for the Semantic Web<sup>13</sup>. *Wikipedia* is the best-known

<sup>13</sup> http://semantic-mediawiki.org

example that utilizes Semantic MediaWiki as its platform. The same platform can also be applied for collaborative terminology projects, e.g. the Finnish Termbank for Arts and Sciences 14. The termbank is a national project to compile terminologies of various academic disciplines on crowdsourcing basis. In 2008, Nuopponen concluded a paper with

"Wikipedia is an interesting model of open online collaboration because the discussions on principles and methods between the participants are available on the web. The next ten years will hopefully see several termpaedias to be born in different special fields." (Nuopponen 2008)

Today, wiki technology seems to be often applied and mentioned when developing integrated collaborative tools for terminology work (e.g. Kudashev 2013; He et al. 2009; Désilets et al. 2009). Wiki technology affords to make connections between terminological entries and related discussions, thus solving some of the problems, which the traditional terminology databases are criticized for. Projects and organizations may utilize this technology, which however needs a server to be installed. For individuals and smaller groups, an interesting online collaboration site based on wiki technology is TermWiki<sup>15</sup>, where anybody can compile a glossary, search and discuss the collections. There is also a commercial, more advanced version for companies.

Also those who are working with ontologies have realized that when ontologies are growing too large to be managed by a single person or a small group, it is necessary to collaborate but traditional tools do not support this. Tudorache et al. (2008) present Collaborative Protégé<sup>16</sup> as a solution to integrate communication tools into ontology tools. According to Tudorache et al. (2008) a big problem is "the disconnect between the produced ontology on the one hand and all the thought and discussion that went into producing this artifact on the other hand". Therefore, for the user of "the ontology, it was often impossible to understand the rationale that went into the design decisions, to find which references were relevant, to find the external resources that informed the modeling decisions". Collaborative Protégé integrates discussions with "ontologyediting process, chats, and annotations of changes and ontology components".

<sup>14</sup> http://tieteentermipankki.fi/wiki/Termipankki:Etusivu/en

<sup>15</sup> http://www.termwiki.com

http://protegewiki.stanford.edu/wiki/Collaborative\_Protege

(Ibid.) The experiences and solutions developed for ontology work are interesting also from the point of view of terminology work since many of the methods and problems are similar.

### 5. CONCLUSION

There has been a notable change in online activities in the field of terminology during the last fifteen years. There is no more questioning if terminology organizations need a website or not, instead the question today is, whether they need social media presence or not. The Internet is not only for building archives and making them accessible but also for actively sharing various types of content. Instead of bibliographical or other meta-information, also the whole content may be made available for free<sup>17</sup> or for a fee. Social media has enhanced possibilities to get connected and to maintain contact as well as to be informed on things happening on the field of interest.

For those working with terminology e.g. terminologists, terminology researchers, translators, students, etc., social media makes it easier to get networked, to find and share information, to meet and participate, get involved, and so on. However, social media offers myriads of alternatives, and it may be an overwhelming task for a newcomer to find the most relevant sites and software. In this paper, therefore only a handful of relevant social media tools were taken as examples. LinkedIn seems to function as a popular people connector in the field of terminology. Twitter is gaining ground as a news media where calls for papers, new publications, coming courses and other topical terminology related information are tweeted and retweeted. Also the traditional CMC tools such as websites have their established role for information dissemination and content publishing. Websites and blogs function as a hub linking various other channels or as an interface to them, while email often receives the role of a notification tool when social media sites inform us that someone liked or forwarded our message, or started to follow us etc. The amount of collaboration and collaborative projects is growing and so does the need for collaborative tools. The technology (e.g. wiki) is now here, it just needs some adjusting to fit for terminological activities.

<sup>7</sup> E.g. Pavel S., Nolet D. *Handbook of Terminology*. Translation Bureau, Public Works and Government Services Canada, 2001, available at: <a href="http://www.bt-tb.tpsgc-pwgsc.gc.ca/publications/documents/termino-eng.pdf?archived=true">http://www.bt-tb.tpsgc-pwgsc.gc.ca/publications/documents/termino-eng.pdf?archived=true</a>.

Social media has its downsides, too, but the focus of this article has been in its affordances for terminological activities. It is important that various types of contributions can be easily located and viewed and that the knowledge maintained and compiled over time does not disappear. Furthermore, social media enables usually the messages to be carefully crafted prior to publishing and connections to be made between individuals, between individuals and content or between an actor and a presentation, as well as between contents.

### REFERENCES

- Désilets A., Huberdeau L.-Ph., Laporte M., Quirion J. 2009: Building a Collaborative Multilingual Terminology System. - Proceedings of the ASLIB: Translating and the Computer, available at: <a href="http://nparc.cisti-icist.nrc-cnrc.gc.ca/npsi/ctrl?action=rtdoc&an=15153226&lang=en">http://nparc.cisti-icist.nrc-cnrc.gc.ca/npsi/ctrl?action=rtdoc&an=15153226&lang=en</a>.
- Dudenhoffer C. 2012: Pin it! Pinterest as a library marketing and information literacy tool. College & Research Libraries News 73(6), 328-332, available at: <a href="http://crln.acrl.org/content/73/6/328.full.">http://crln.acrl.org/content/73/6/328.full.</a> pdf+html>.
- He S., Nachimuthu S. K., Shakib S. C., Lau L. M. 2009: Collaborative Authoring of Biomedical Terminologies Using a Semantic Wiki. - Proc. of AMIA 2009 Symposium, San Francisco, California, 234238, available at: <a href="http://www.ncbi.nlm.nih.gov/pubmed/20351856">http://www.ncbi.nlm.nih.gov/pubmed/20351856</a>.
- Kaplan A. M., Haenlein M. 2010: Users of the world, unite! The challenges and opportunities of Social Media. - Business Horizons 53(1), 59-68, available at: <a href="http://dx.doi.org/10.1016/j.bushor.2009.09.003">http://dx.doi.org/10.1016/j.bushor.2009.09.003</a>>.
- Kudashev I. 2013: Quality Assurance in Terminology Management: Recommendations from the Termfactory Project. University of Helsinki, Palmenia Centre for Continuing Education, Kouvola, available at: <a href="http://www.projectglossary.eu/download/QA\_in\_TM\_Kudashev.pdf">http://www.projectglossary.eu/download/QA\_in\_TM\_Kudashev.pdf</a>.
- Leuf B., Cunningham W. 2001: The Wiki Way: Quick Collaboration on the Web, Boston, Addison-Wesley. Nuopponen A. 1996: Terminology Online: From Term Banks to the World Wide Web. - Terminology Science & Research 7(1), 21-27.
- Nuopponen A. 2008: Term lists or multimedia and collaboration? Future directions for online terminology resources. - Proceedings of XVIth European Symposium on Language for Special Purposes (LSP) Specialised Language in Global Communication, University of Hamburg, 27-31 August 2007.
- Treem J. W., Leonardi P. M. 2012: Social Media Use in Organizations. Exploring the Affordances of Visibility, Editability, Persistence, and Association. - Communication Yearbook 36, 143-189, available at: <a href="http://comm.soc.northwestern.edu/leonardi/files/2012/09/socialmedia.pdf">http://comm.soc.northwestern.edu/leonardi/files/2012/09/socialmedia.pdf</a>.
- Tudorache T., Noy N. F., Tu S., Musen M. A. 2008: Supporting Collaborative Ontology Development in Protégé. - The Semantic Web - ISWC 2008, Berlin, Heidelberg: Springer, 17-32, available at: <a href="http://link.springer.com/chapter/10.1007/978-3-540-88564-1">http://link.springer.com/chapter/10.1007/978-3-540-88564-1</a> 2>.

# SEKITE @TERMLIST TWITTER'YJE! — SOCIALINĖ ŽINIASKLAIDA KAIP TERMINOLOGINĖS INFORMACIJOS IR VEIKLOS PRIEMONĖ

Straipsnyje kalbama apie tai, kaip socialinė žiniasklaida yra ar galėtų būti naudojama terminologinei veiklai ir terminologinės informacijos sklaidai. Nagrinėjama įvairi, su terminologija susijusi, socialinės žiniasklaidos priemonėmis pristatoma veikla ir bandoma nustatyti, kas yra ir kas galėtų būti padaryta. Kaip teorinis pagrindas imama keturi socialinės žiniasklaidos bruožai (matomumas, nuolatinis buvimas, redaguojamumas, bendrumas), pateikti Treem ir Leonardi darbe (2012) kalbant apie organizacijos komunikacija. Terminologinei veiklai svarbu tai, kad socialinės žiniasklaidos priemonėmis

pateikta įvairių tipų medžiaga yra nesunkiai randama ir peržiūrima, sukauptos žinios nedingsta, galima užmegzti ryšius tarp žmonių, žmogaus ir turinio ar dalyvio ir pateikties, taip pat tarp turinio ir turinio.

Palyginus su tradicinėmis interneto komunikacijos priemonėmis, tokiomis kaip interneto svetainė, elektroninis paštas ar elektroninio pašto grupė, naudojant socialinės žiniasklaidos priemones lengviau susisiekti, susitikti ir dalyvauti, įsitraukti, dalintis informacija ir ją rasti. Kita vertus, socialinė žiniasklaida pateikia daugybę galimybių, todėl gali būti sunku rasti labiausiai poreikius atitinkančias svetaines ir programinę įrangą. Straipsnyje daugiausiai dėmesio skiriama toms socialinės žiniasklaidos priemonėms, kurios naudingiausios dirbantiems terminologijos darbą. Terminologijos srityje LinkedIn – populiari priemonė norintiems susisiekti, Twitter vis labiau įsitvirtina kaip pranešimo apie kvietimus dalyvauti konferencijose, naujus leidinius, vyksiančius mokymus ir kitos aktualios informacijos pateikimo priemonė. Tinklaraščiai ir tradicinės interneto svetainės atlieka įprastą vaidmenį skleidžiant informaciją ir skelbiant turinį. Abi šios priemonės taip pat jungia įvairius kitus kanalus. Elektroninis paštas paprastai naudojamas kaip pranešimo priemonė. Socialinės žiniasklaidos technologijos, tokios kaip vikis, sujungia sąveikos ir turinio kūrimo priemones ir skatina bendradarbiavimą.

Gauta 2013-11-11

Anita Nuopponen University of Vaasa Wolffintie 34 65200 Vaasa Finland