Affective Impact of the use of Technology on Employed Language Specialists: An Exploratory Qualitative Study

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ABSTRACT

A well-established fact in the information systems literature is the importance of human aspects of technology use. In our doctoral research, we look into the emotional effort that employed language specialists have to put in their daily work, in the light of an increased use of language technology tools (LTT) by language service providers. In 2011 and 2012, we conducted qualitative studies to understand how LTT were perceived by language specialists. We observed translators and other language specialists at work and conducted 12 in-depth interviews. We noticed that respondents often mentioned affective constructs, such as stress or anxiety, even when not prompted to describe their affective state. We then reanalyzed our transcripts and written notes in search for answers to the following specific question: "What affective variables do language specialists spontaneously mention when asked to describe their use of LTT?" Using content analysis, we found that respondents often mention some form of occupational stress, or relief of occupational stress, along with other affective variables, in relation with the use of LTT. We argue that emotional well-being and stress relief should be measured and serve as a guide for the design and implementation of language technology tools.

1. Background to the research

The DBA (Doctorate in Business Administration) at the Faculty of Administration of Université de Sherbrooke (Canada) is a research doctorate program with a focus on bringing theoretical and managerial solutions to real industry-based issues. When DBA students have completed their courseload, they have to conduct an on-site research before they are allowed to present their research project. This on-site research is to make sure that the theoretical and practical contribution of the final research will be useful for the industry. This on-site research is called the residency phase in the DBA curriculum.

In our case, we were interested in the translation industry. Initially, we aimed at understanding the success factors of implementing new language technology tools (LTTs) within

translation service providers (TSPs). For our residency, we were awarded a 4-month Mitacs[1] internship in 2012. During this residency, we observed language specialists at work in a medium-sized Montreal-based TSP, and we conducted in-depth interviews with employees of this TSP. We also conducted interviews with other language professionals and language technology vendors in Québec and Ontario.

The data analyzed below were collected during the residency phase of our doctoral research, in 2012. We conducted a first data analysis in 2012, to answer our residency research question, and we reported the results in our residency research report. The methodology and the results of data collection and first data analysis are presented in section 2.

However, even though the in-depth interviews were focusing on LTT use, we observed that the data also suggested that use of LTT induced several affective reactions. For the 36th *Translating and the Computer* conference, we conducted a second data analysis centered on affective reactions to LTT use. The results of this second data analysis are presented in section 3.

2. Residency — First data analysis

2.1. Theoretical background and research questions

We were interested in the use of language technology tools by Canadian translation service providers. Were the LTTs useful to TSPs?

To answer that question, our starting point was a classification proposed by Gurbaxani and Whang (1991). Those authors suggested that an information system can play five primary roles in an organization :

« a) it increases scale efficiencies of the firm's operations (operations); b) it processes basic business transactions (transaction processing); c) it collects and provides information relevant to managerial decisions and even makes decisions (decision support); d) it monitors and records the performance of employees and functional units (monitoring and performance evaluation); and e) it maintains records of status and change in the fundamental business functions within the organization and maintains communication channels (documentation and communication). » (p. 66)

We wanted to know if language information systems (of which language technology tools are components) were actually playing these roles for TSPs.

Besides, we wanted to know whether language technology tools were supporting mostly *production* processes or *support* processes of TSPs. Along with Rivard and Talbot (2001), we define a *process* as an activity that transforms an input into an output, using resources available in the organization. A *production process* deals with manufacturing the product or providing the service itself, while all other processes support the production process and are called *support processes*. For a translation service provider, the production process deals with transforming a document in a source language into another document in a target language. The support

[1] MITACS is a Canadian organization funding internships that give postgraduate students an opportunity to apply their theoretical knowledge in real-life work settings. Companies that partner with students for those internships also benefit from current research approaches.

processes include technology procurement, training, human resources management, sales or financial management, to name only a few. Are language technology tools particularly supportive of production processes or support processes in TSPs?

Finally, we also wanted to know what translation industry players thought a « language technology tool » was. As far as we know, there is no general consensus about what a LTT does. In our view, a LTT was something that helped a translator translate. It could be anything from the electronic version of a dictionary, a concordance program, a translation memory tool or a machine translation engine to a voice recognition or project management software. On another note, from the user's point of view, we were wondering whether the use of a specific tool occurred on a voluntary or a mandatory basis.

Consequently, our global research question was : « What do translation service providers' employees, managers and vendors think of the usefulness of language technology tools for the TSP? ».

Specific research questions included : « How do TSP's employees, managers and vendors define a language technology tool? », « Are LTTs more useful to production processes or support processes? » and « What would you like LTTs to do better? ».

2.2. Methodology

Since the residency internship was to serve as an exploratory study for our doctoral research, we chose an exploratory, qualitative research design based on an inductive approach. An exploratory study called for an inductive approach, that is, one that let the respondents voice their main concerns and opinions, with as little guidance from the interviewer as possible.

We developed a brief interview guide, with only a couple of open-ended questions, including questions about how respondents would define a language technology tool, what LTTs they were using, how useful they felt those LTTs were, and what they thought a « perfect » LTT should do. We collected data within our main Mitacs internship partner (the « Mitacs partner »), a medium-sized Montreal-based TSP, through non-participating observation and in-depth individual and group interviews. We also conducted interviews with other players in the industry.

Non-participating observation took place during four three-day-stays at the Mitacs partner offices. We shadowed employees for 30-minute to 1-hour periods, taking notes and occasionnally asking questions. Employees were performing translation, editing, and project management tasks.

Combining all respondents, 12 in-depth individual interviews and two group interviews were conducted; the interviews lasted 33 minutes on average. In total, 27 language specialists from 9 companies were either interviewed or observed, or both. All companies were Canada-based (provinces of Québec and Ontario).

The table below shows, for each of the 27 respondents, the respondent's role (manager, junior or senior translator, reviser, or a combination of those roles). Each respondent has also been given a code, so that we could quote their answers without having to refer to their identity.

GEST stands for « gestionnaire » (French for « manager »), while TRA stands for « traducteur » (or « translator »).

GEST01	Manager and senior translator	TRA01	Translator and reviser
GEST02	Manager	TRA02	Junior translator
GEST03	Project manager	TRA03	Reviser
GEST04	Manager and senior translator	TRA04	Reviser
GEST05	Manager	TRA05	Junior translator
GEST06	Manager and senior translator	TRA06	Senior translator
GEST07	Manager and senior translator	TRA07	Reviser
GEST08	Manager and senior translator	TRA08	Junior translator
GEST09	Manager	TRA09	Junior translator
GEST10	Manager	TRA10	Translator and reviser
GEST11	Manager	TRA11	Reviser
GEST12	Project manager	TRA12	Junior translator
GEST13	Senior translator	TRA13	Junior translator
		GEST14	Manager and senior translator

Table 1: Role(s) and codes of all 27 respondents

2.3. Results

The general consensus is that a language technology tool can be defined as « a tool that is useful for language specialists ». It could be either a software, a device or a database. Its main characteristic is that it can help language specialists do what they do, whether it has been developed specifically for language specialists or not. In that view, a translation memory is obviously a LTT, but an electronic version of the Merriam-Webster dictionary is also a LTT, as is Twitter or MSN when translators use those platforms to share translation knowledge.

We observed that the use of LTTs for day-to-day work is common standard for the TSPs surveyed. More than that, all respondents find it normal to use an *active* language technology tool to translate documents[2]. Many of them use several active language technology tools on a daily basis.

[2] We call « *passive* language technology » a technology that users can refer to when they want to do translation; users must then transfer the knowledge themselves into the translated material. An electronic version of a dictionary or a concordance program are passive language technologies. We call « *active* language technology » a technology that enables users to create or modify translated material. A translation memory or a MT engine are active language technologies. For more details about the difference between

Use of a specific passive language technology tool is typically voluntary, while use of a specific active LTT is typically required either by the client or by the TSP. The TSP generally works with the translation environment that their big clients want. For smaller or occasional clients, the TSP typically uses the off-the-shelf translation environment it has chosen to implement company-wide. No TSP in the study has a proprietary translation environment.

Globally, language technology tools are doing a good job in helping the TSP do its daily work. Among the five roles proposed by Gurbaxani and Whang (1991) (see above), LTT are quite useful with the four first roles, i.e. helping with operations, transaction processing, decision support and performance evaluation. However, a lot still has to be done with the fifth role (helping with documentation and communication). For many respondents, the main problem with integrating LTTs within the production chain is the lack of a smooth communication between different tools or different modules within a tool. The « perfect » LTT would be made of several independent modules that would cover all the TSP needs and would seamlessly share the same information.

[The perfect tool] would do everything. It would acknowledge receipt of the order. It would analyze the project. It would know the perfect translator for the job and ask him or her directly – it's a perfect tool, remember : « Can you do the job? Is the deadline acceptable? » The translator would be able to translate directly within the tool; when the translation is ready, the tool would tell the reviser : « The translation is ready for revision. » It would automate not only the translation process, but also the management process. And it would not need two, three, four different softwares; it would be a one-stop, global tool. That would be nice. (GEST07)[3]

2.4. Conclusions of first research

We first conducted an exploratory study to confirm that translation companies needed help in implementing language technology tools. However, it appears from the study results that TSPs are doing a very good job in using the tools to perform their daily tasks. What is not so easy is evaluating whether users are happy to use the tools.

3. Second data analysis

3.1. Theoretical background and new research questions

A well-established fact in the information systems literature is the importance of human aspects of technology use. When Glass, Ramesh and Vessey (2004) compared Computer science (CS), Software engineering (SE) and Information systems as the main academic subdivisions of Computing discipline, they found that IS was the only research field conducting analysis at the behavioral level, while the other two were conducting analysis at the technical level. Using

active or passive language technologies, or for a snapshop of language technology tools used in Canada in 2011, see Taravella (2011).

[3] Original quote : « [L'outil idéal] ferait tout. Il ferait la réception du travail, il l'analyserait, ferait le lien avec le traducteur le plus compétent pour le réaliser, communiquerait la question – dans un monde idéal, là - avec le traducteur en question : « Peux-tu le prendre, peux-tu placer ça? », permettrait aussi au traducteur de travailler directement dans l'outil en question pour faire sa traduction, ensuite, quand c'est prêt, communiquerait directement avec le réviseur pour dire : « C'est prêt à être révisé. ». Automatiser non seulement le processus traductionnel, mais le processus de gestion aussi. Mais pas dans deux, trois, quatre logiciels, mais dans un seul outil global. Ça, ça serait bien. »

machine translation or refusing to work as a post-editor are examples of behaviors that can be analysed in the view of Information systems.

However, intention-to-behavior theories within the Information Systems field are often based on characteristics of the tools, not characteristics of the users. For instance, Davis (1989)'s Technology Acceptance Model (TAM) features two main tool characteristics : perceived ease of use and perceived usefulness. When a tool is both useful and easy to use, according to the user's perception, the user is likely to behave a certain way, namely use the tool. But this theory says nothing about how the user feels. It deals only with what the user thinks. As Davis (1989) himself wrote : « the role of affective attitudes is an open issue » (p. 335).

For language specialists within the translation industry (other than those who are self-employed), the use of a specific LTT is seldom a chosen behavior; it is usually decided by the client and/or the employer. Language specialists still have many behavioral choices : Will they use the tool well? Will they make useful changes to suggestions provided by the tool? Will they try to be creative in doing so? Will they remain engaged at work? Will they express dissatisfaction or lack of motivation? Will they eventually leave their job, or even the industry?

All those positive and negative behaviors are related to affective variables : attitudes, emotions, and moods, as well as dispositional variables (personality traits). According to Affective Events Theory (Weiss and Cropanzano, 1996), reactions to work events shape workers' affective states; in turn, affective reactions cause workers to adopt specific behaviors. Thus, a better understanding of language specialists behaviors at work starts with a better understanding of their affective reactions to new technology tools.

Consequently, we performed a second analysis of our residency data, with a new global research question: « What affective or dispositional constructs do translation service providers' employees, managers and vendors mention when speaking of language technology tools? ».

3.1. Methodology[4]

Analyzing qualitative data is trying to find, among a huge amount of data, those elements that are relevant for our research question. Since interviews were conducted with as little rigidity as possible, in a non-controlled work environment, we collected a lot of data that were only remotely relevant for this question. To paraphrase Gavard-Perret et al. (2008), the main difficulty in analyzing the data is then to find « nuggets ». Information nuggets are useful pieces of information that we are able to use.

To find those nuggets, we chose to perform a horizontal thematic content analysis. We identified affective themes and sub-themes throughout all interviews, grouping answers from different interviews to spot affective or dispositional variables that were consistently mentioned by several respondents.

Results are summarized below.

[4] A French version of this section has been submitted to AILIA as part of our Mitacs internship final report (Taravella, 2012)

3.3. Results and discussion

Sub-theme	Theme
Personal history Being a « real » language specialist NOT being a TI specialist Human work is still necessary Quality is not valued in rates Translators do not value their own work	Professional identity
Fear of change Guilt related to non-imputability of technical errors Fear of being deceived or conned by vendors Being confused with processes	Lack of control
Interchangeability of translators Very aggressive vendor competition Translation is an economic burden	Loss of individual identity Negativity of the environment
Time-related stress Quality-related stress Income-related stress	Stress
Technology is taking over translation time Silly, time-grudging technical decisions	Frustration
Clients lack of process consistency is infuriating	Anger
Technical discussions are boring	Boredom
Work is spoon-fed	Stress relief

Respondents tend to mention mostly negative aspects of using LTTs. There seem to be a bias toward highlighting problems more than benefits. Indeed, the fact that affective impacts of using technology are almost never mentioned in the management's discourse can be a good reason to feel undervalued and to be wanting to express one's frustrations. However, most respondents recognized that the use of LTTs has made their work easier, from a technical point of view, and that they get some stress relief in using technology tools.

It was quite apparent in the data analysis process that mentions of negative effects were voluntarily brought up by respondents, as if they wanted to take the unique opportunity to voice their frustrations. On the other hand, they almost always mention stress relief benefits of using LTTs, but in a casual way, as if benefits were commonly known and accepted.

This makes us hypothesize that negative affective impacts of using LTTs are emphasized by the lack of taking those negative impacts into account. Maybe language specialists would find an easy, yet necessary relief in being allowed to express their frustration, fear and criticism toward technology tools.

4. Next steps and conclusion

Using content analysis, we found that respondents often mention some form of occupational stress, or relief of occupational stress, along with other affective variables, in relation with the use of LTT. This is an interesting result, for well-being of human resources that use LTT is never mentioned as a design criteria. Yet, as O'Brien (2012) reminds us very firmly : "[I]t is how the technology is created, or implemented, that has a dehumanising effect. Technology created without consideration for the task or end users removes those end users from the equation."

In the view of our residency research results, we decided to focus our doctoral research on the emotional effort that employed language specialists (terminologists, translators, revisers) have to put in their daily work, in the light of an increased use of language technology tools by translation service providers. How does the affective states of language specialists evolve throughout the day, the task, or the change of environment? To answer that question, we intend to measure affective, dispositional and environmental variables in a longitudinal multiple-case study.

We argue that emotional well-being and positive or negative affective states should be measured and serve as a guide for the design and implementation of those tools. As a paraphrase of Desilets et al (2009)'s argument saying that « translators might better be served by the research community if it was better informed about their work practices » (p. 1), we argue that translators might better be served by the LTT community and the management community it those were better informed about their affective reactions to LTTs.

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