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THE IMPACT OF CONTROLLED LANGUAGE FOR AUTOMATIC TRANSLATION: EFFECTIVE GLOBAL COMMUNICATIONS

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Abstract

An experimental study that manipulates effectively using automatic translation in a global setting with the use of a controlled language.

Keywords: Global information systems, electronic communications

Introduction

As companies become global, application software that is key to companies' success must be significantly changed to be usable in multiple countries. One important type of application that must be changed for global use is communications software. In multinational corporations the easiest way of communicating between two geographically disperse areas is by telephone or e-mail. Because of the time differences between countries, e-mail may be the better choice of communications because of its asynchronous property (Yates and Orlikowski, 1992).

How can employees in global firms communicate with others when they do not have a common language? Human translation of daily communications is slow and costly, so increasingly computer-based automatic translation software is used as an immediate and lower-cost solution. Automatic translation may be accomplished via standalone applications or through functionality built into electronic communications media, such as email and groupware.

Automatic translation is not perfect. Automatic translation systems can be supplemented with vocabularies that are unique to a company or field or that have been augmented by human translation of words and phrases. Users of automatic translation products are usually asked to write in what is called "controlled language" to help in the automatic translation. Harkus (Harkus, 2001) lists specific, controlled language writing practices: simple and clear copy (e.g., limit the number of nouns that qualify a noun) that avoids humor, idioms and analogies that don't translate to other cultures, and formatting rules (e.g., do not uses dashes or slashes as punctuation marks) that facilitate translation. The focus of this study is on how automatic translation and controlled language writing impacts message accuracy and users' perceptions of their communication system, especially as communication tasks vary in their equivocality.

Literature Review

Information Richness Theory (Daft and Lengel, 1986), (Rice, 1992), posits that individuals will choose media higher in richness for those managerial tasks higher in equivocality or ambiguity (Ngwenyama and Lee, 1997). Markus argues that information richness theory does not apply because managers use e-mail more than the theory predicts, and even with simple modifications to the theory, it does not explain managers' use of e-mail (Markus, 1994). Using channel expansion theory, Carlson and Zmud (Carlson and Zmud, 1999) show that richness perceptions of a channel vary over time, with experience, and are situated in the communication context.

Automatic translation technology has the potential to disrupt email users' communication skills, since controlled language by its very nature changes the communication context, and may impact users' perceptions of media richness as well communication performance. In terms of media richness, there may be a kind of *channel contraction*, and thus:

Hypothesis 1: Perceived richness of electronic mail will decrease when individuals use automatic translation and controlled language for communications.

The reason for using controlled language with automatic translation is to increase the accuracy of the translated text. In this study communication performance is a proximate assessment (Rice, 1992) of the accuracy of the email message content. However, can messages written in a controlled language support rich messages (communications that have the ability to change human understanding, overcome differing conceptual frames of reference, and clarify ambiguous issues in a timely manner (Daft and Lengel, 1986))? Such rich messages are needed when the communications task is equivocal (uncertain, open to several interpretations, a "messy, unclear field" (Daft and Lengel, 1986, p. 554)). In this situation information richness theory may hold, in that there is a necessary fit between the nature of the message and the richness of the communication channel:

Hypothesis 2: When the communication task is not equivocal, message accuracy will increase in using a controlled language over not using a controlled language for automatic translation in e-mail messages.

Hypothesis 3: When the communication task is equivocal, message accuracy will increase in using a controlled language over not using a controlled language for automatic translation in e-mail messages.

Experimental Design

The participants in the study are graduate business students at a large, Southeastern university. Participation is voluntary, course credit is given to students who participate or complete an alternative assignment. The experiment, including random assignment of subjects to conditions, study instructions, experimental tasks, and scales, is delivered via a computer program. The experiment consists of a 2 (no tutorial; tutorial) x 2 (no-pretest; pretest) factorial design. A Solomon four-group design was used to isolate the effects of the pre-testing from the effects of automatic translation training. (See Table 1.)

Table 1. Treatment Conditions

Treatment Group	Pretest	Experimental	Posttest
A	X	X	X
B	X		X
C		X	X
D			X

Pretest = Communication Tasks 1 and 2 + Demographic & Perceptual Scales
Treatment = Tutorial on controlled language
Posttest = Communication Tasks 1 and 2 + Perceptual Scales + Manipulation Check

Following Markus (Markus, 1994) and Carlson and Zmud (Carlson and Zmud, 1999), it is important to control the context of the experiment. Subjects are told that they are project managers for a global software development team, and the email use between team members is "intrenched" (everyone is a frequent user). Communication Task 1 (non-equivocal task) asks subjects to write an email that reminds the team of an upcoming project deadline, asks for a progress report, sends some projected budget numbers, and schedules the next videoconference meeting. In Communication Task 2 (equivocal task) the project manager has to communicate mixed performance feedback to team members: while progress in some aspects are satisfactory (meeting budget and system requirement goals), the subject is instructed to be firm in communicating that the current progress the team was making in terms of schedule would not be tolerated, and to urge team members to improve immediately.

The participants in the automatic translation control language training treatment condition are given a tutorial on how to write for automatic translation. All treatment groups are told that the following e-mail messages would be automatically translated into a different language. All groups are then told to write two more e-mail messages. To reduce memory effects, the participants in the pretest condition were able to use their previous e-mail messages as a starting point for the following two messages. This resulted in all four groups having to type approximately the same amount of information.

The participants' GMAT verbal score is used to measure writing ability as a covariate. Collection of the GMAT verbal score is done with a process that ensures the confidentiality of the participants, and the researchers are blind to the subjects' identity and

GMAT verbal scores. A second covariate, individual experience with email use, as well as the perceptual measure of perceived media richness, are collected using the scales of Carlson and Zmud (Carlson and Zmud, 1999).

An automatic translation program from Systan is used to translate the subjects' messages. Native speakers of the message language on a rate message accuracy on a 7-point Likert scale. Multiple raters will be used, and ratings will be checked for inter-rater reliability. The manipulation, training in the use of controlled language, is checked via items on a 7-point Likert scale. An ANOVA will be conducted to ascertain that the experimental group had a different mean from the control group.

Analysis

A MANCOVA will be conducted with accuracy and perceived media richness as dependent variables. The treatment group will be used as the independent variable, and GMAT Verbal score and email experience used as covariates. If the omnibus MANCOVA test is significant then step-down ANCOVAs will be conducted to interpret the results.

Anticipated Results and Contributions

The purpose of this study is to investigate the impact of using automated language translation systems and a congruent writing style on electronic communication performance and channel perception. While information richness theory and research both informs the experimental design and supports the hypothesized differences in impact when the communication task varies, the use of automated translation and controlled language may invert the channel expansion research results (Carlson and Zmud, 1999) to create a channel contraction. These results should provide empirical evidence related to both theory bases, as well as inform managers in global settings about the impact of automatic translation.

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