Made for Japan

Made for Japan:

Introducing the Japanese Job Descriptive Index

By

Gregory Gerard Greer

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CHAPTER ONE

MACHINE TRANSLATION (MT)
VERSUS HUMAN TRANSLATION (HT):
THE STATE-OF-THE-ART OF MT IN 2012 AND
THE PREDICTED STATE-OF-THE-ART IN 2100

This article discusses the state-of-the-art of Machine Translation (MT) in 2012 and presents the author's 2011-2012 research on both MT and HT (Human Translation). The author's research included the first-ever forward-back translation (to and from Japanese) of the famous Job Descriptive Index (JDI). The HT results secured through a live focus group the author administered consisting of five Japanese university professors in Tokyo is compared to the MT results obtained for translation of the same material. The research design forced the study in a new direction and uncovered surprising results. This study was undertaken from the perspective of American English technical editors, and examined their relationships to translation efforts.

Data for this article was drawn from a focus group held at Hosei University in Tokyo, Japan, in November 2011, comprised of four Industrial-Organizational Psychology (I/OP)-competent Japanese university professors recruited to carry out the forward-back translation. On November 25, 2011, the author conducted the focus group at Hosei University in Tokyo, Japan. It was titled "A Case Study for American English Editors: Japanese Forward-Back Translation of the Job Descriptive Index (JDI) Surveys." The author recruited the following four Japanese university professors to complete the translations:

- Tomoki Sekiguchi, PhD, Osaka University
- Yoichiro Hayashi, PhD, Hosei University
- Tomohiro Nakagawa, PhD, Kinki University
- Norihiko Takeuchi, PhD, Aoyama Gakuin University

Teruchika Katsumata, PhD, International University of Health and Welfare, also participated in the focus group and offered criticism.

The data gleaned from the focus group analysis of HT was then compared to the MT results for the same text. The goal was to gauge the state of the art of HT versus MT in 2011-2012; in particular, to see if MT could match or at least come close to HT. The results showed that for a rigorous forward-back translation, MT in 2012 cannot match HT. However, for forward-only translation, it was shown in the research conducted that MT in 2012 offers an extremely powerful tool that could potentially reach a point of perfection sometime in the 21st century.

The JDI family of surveys include the Job Descriptive Index (JDI), the Job in General (JIG), the abridged Job Descriptive Index (aJDI)/Abridged Job in General (aJIG), the Stress in General (SIG), the Trust in Management (TIM), the Scale of Life Satisfaction (SOLS), and the Retirement Descriptive Index (RDI). The rigorous forward-back translation employed for this translation could ultimately lead to the creation of six new international surveys. International surveys are surveys designed in one country for use in another.[1]

A review of the literature concerning translation of international surveys from English reveals that success since the 1950s has been achieved through reliable, accurate, and valid translations. In one study, "Translating the Short-Form Headache Impact Test (HIT-6) in 27 Countries: Methodological and Conceptual Issues," pre-editing was performed in order to improve translation equivalence and, accordingly, the HIT-6 was not difficult to translate. The method used for the translation was the standard forward-backward translation, "which is widely used in cross-cultural psychology and has become the standard in health status assessment."[2] For the case study in this research effort the same technique was applied, with one team leader, Professor Sekiguchi of Osaka University. However, according to Nakayama et al.'s work with the Japanese translation of the General Well-Being Schedule (GWBS), it appears that back-translation by two native [American] bilingual translators is preferable.[3]

Similar to the JDI, "GWBS is a widely used, self-administered questionnaire…The literature has shown the high validity…and reliability of the instrument."[4] The GWBS was first translated by three bilingual doctors and then back-translated by two Americans. Non-medical professionals were then consulted to help determine the most appropriate wording.

For the translation efforts in the current study the author supposed that the JDI surveys would be simpler to translate since there were only minor

sentences and no elaborate text – just short instructional sentences and one-word items. However, as will be discussed later in this article, one-word items with no context proved to be the most challenging exercise for the translation team as well as for the MT effort.

Prior to showing the results of the focus group and the MT comparison, HT and MT should be discussed. What is translation? Brian Mossop has suggested that "there is a curious gap in our knowledge about translation," which implies the question of quality. The definition of quality is "whatever constitutes acceptable quality in the market for which a particular translation is prepared."[5] In his 2011 book, *Is That a Fish in Your Ear? Translation and Meaning of Everything*, David Bellos adds, "Give a hundred competent translators a page to translate, and the chances of any two versions being identical are close to zero."[6] Bellos goes on to write that "translations are substitutes for original texts. You use them in place of a work written in a language you cannot read with ease."[7] Hence, it appears that any definition of translation is nebulous.

American technical editors are needed in matters of editing American English text and managing massive volumes of paperwork intended for use in the United States or for use with Americans. In the case study discussed in this article, bilingual translators familiar with American English, some of whom were educated in the United States, were hired. It was the intent of the focus group to uncover the thinking processes of non-native American English bilingual translators in order to foresee problems that translators working with Americans and American English technical editors might encounter when they receive or manage translated non-native written text and documentation for actual editing (i.e., rewriting to conform to Standard Edited American English). Technical editors may also serve as project managers for such translations, overseeing teams, sorting paperwork, or directly communicating with everyone involved in the process, including persons outside the United States.

For translations where the stakes are not as high (e.g., for purposes of loose communication where superior accuracy is not required) online translation tools such as that found on http://www.babelfish.com, though useful, are probably not the most reliable means due to the questionable written text that is produced.[8] However, if the goal is securing the *flavor* (via "text skimming") of what a foreign-language text means, then online tools might be considered useful for receivers of communications (e.g., small or large companies, private persons), allowing them to make quick determinations about what they are working with.[9] MT offers instant results and therefore cannot be regarded as useless. Making use of MT is an opportunity for determining resource allocations.

Resource allocations are integral to any company and often to private persons when determining how much to spend on something with respect to return on investment (ROI). MT is obviously cheaper than HT, and every business attempts to avoid unnecessary expenses. If MT can enable companies to determine if potential projects (e.g., foreign-language email inquiries, or even something as simple as a hotel reservation, which could cost thousands of dollars) are worth the resource expense (i.e., time, money, staff), MT is certainly valuable to them. A perfect example would be a local hotel in a remote area that receives a request for cost estimates. Upon receiving a foreign-language inquiry, the hotel could use MT to get the gist of the inquiry and respond in the local language. The original senders could use MT to interpret the response to their inquiry.

One important issue is determining the appropriate MT software/device to use for the particular translation project at hand. Travel communication, for example, is well served by handheld electronic translators, such as Ectaco, Inc.'s JetBook®, Partner®, or iTRAVL®. For medical material, MedBridge® Systems MedBridge® 2.5 software enables non-English-speaking medical practitioners to speak with their English-speaking counterparts. As for legal material, Google Translate software can be found on several official state websites for translation of downloadable forms.

The intent of this research was to provide one example of the duties of a technical editor in a major forward-back translation from an American English professional writing and editing (PWE) perspective. American technical editors are responsible for accommodating American English, as opposed to the numerous other forms of English. Whether in the United States or overseas, American technical editors often encounter foreign-written English or material that was originally written in a foreign language for use in the United States.

There is no question of the inextricable link between the United States and Japan, and although English is not an official language in Japan, English in its various forms is the lingua franca in Japan between Japanese people and non-Japanese people. One of Japan's largest trading partners is the United States[10] and a significant number of English texts (e.g., user guides, instruction manuals) are created in Japan for use in America. Therefore, there is an obvious need for technical editing work to be conducted by American English editors.

From the perspective of American English professional writing and editing, a review of the literature suggested that there are too many problems with MT and, notwithstanding millions of dollars devoted to its development, MT cannot replace the quality, accuracy, and reliability of HT. MT still requires extensive post-editing, and even in the case of HT

the need for post-HT editing remains. Professional writing and editing is integral to highly refined, accurate, perfected translations. For example, "Different kinds of translation are needed for different purposes. If one is translating a legal document all one needs to do is convey the meaning; but if one is translating literature one has to convey feeling as well as grammatical senses."[11] Furthermore,

> "The assessment of Machine Translation (MT) quality is difficult; the fact that no standard evaluation method or measurements have come to the fore over the past three decades is but a pertinent indicator of the extent of the problem…[MT is nonetheless regarded] as an important strategic technology that can be expected to play a key role in the internationalization of the global community…Three leading developed communities, the United States, the European community, and Japan have all invested heavily in this area…However, despite the commercial maturity of an increasing number of systems it would be wrong to assume that a high level of competency has been attained…Most current systems post-editing of the translation text is an obvious sign that truly automatic Machine Translation remains a long way off."[12]

Because of this, and because Post-editing continues to be vitally important, technical editors are an integral component of substantive translation. Technical editors at every level (i.e., entry level, junior, and senior) must be able to recognize machine-translated text and be prepared to handle rewriting work requiring considerable thinking insofar as they might have to engage in extensive extrapolation in order to create a coherent and readable document on which many people may rely.

The role of the editor is particularly important when it comes to MT, particularly because, as Steve Vitek argued,

> the problem is that machine translation does not understand the meaning of the document at all…Although most of the technical terms used by a machine will be correct, it is up to the reader to make sense of those words haphazardly jumbled up together by a non-thinking machine…If a translation done by a machine is accurate, it can be accurate only coincidentally because the machine does not understand the concept of accuracy.[13]

However, in the realm of Japanese to English patent translation, Vitek affirmed that:

> machine translation will never amount to anything more than a useful tool for translation of words, but not really meaningful sentences, because it is impossible for machines to understand the concept of meaning, as it is impossible to translate from one language into another without a clear

understanding of the meaning in the original language…[However,] the
Japanese Patent Office website, which offers free online translation
service…comes pretty close.[14]

The role of professional editors in the translation process is to provide
"post-editing" when dealing with MT and "revision" when dealing with
HT.[15] Although speed is the benchmark for MT, HT is obviously needed
for important texts requiring a high degree of accuracy and/or when the
final product is a document that will be used repeatedly or referred to for
an extended period of time (e.g., legal documents, user guides).

Notwithstanding Vitek's claim about MT in 2001,[16] since then MT
research has moved in new directions, great strides forward have been
made, and a bright future certainly exists for MT. For example, review of
more current literature suggests that although MT was largely the status
quo ante towards the end of the 20th century (i.e., no major breakthrough
had been achieved), "the field of MT has undergone something of a
revolution over the last 15 years, with the adoption of empirical, data-
driven techniques originally inspired by the success of automatic speech
recognition."[17] In the post-9/11 era a tremendous need has arisen for
instant foreign-language reconnaissance. Considerable resources have
been expended and major developments in MT research have occurred.
One company set a goal of achieving 90% to 95% accuracy with Arabic
and Mandarin Chinese by 2010.[18] That is not a quantum leap, but would
be an impressive achievement considering HT is only expected to be 99%
accurate.[19] There is no such thing as perfect translation, whether HT or
MT. Nonetheless, the age of instant translation has definitely arrived.[20]

In order to give a scale to just how much money goes into translation,
"in 2006, the European parliament spent about 300 million Euros [roughly
400 million United States dollars], or 30% of its budget, on the
interpretation and translation of the parliamentary speeches and EU
documents. In total, 1.1 billion Euros are spent per year for the translation
and interpreting services within the European Union, which is around 1%
of the total EU budget."[21] If 99% MT could replace HT and interpreting,
the savings to Europe alone (i.e., tens of billions of USD over the course
of any decade) is worth almost any price.

Having been described as "more complex than building an atomic
bomb…Smooth, immediate translations between people speaking different
languages would be a remarkable achievement of enormous economic and
cultural benefit," and, as "one of the ten emerging technologies that will
affect our lives and work in 'revolutionary ways' within a decade,"[22] it
appears that perfected MT is one of the most coveted goals of the 21st
century. However, as one of the earliest computer science problems to be

attacked, it has proven to be one of the most difficult,[23] remaining elusive to this day. Nonetheless, MT "has improved dramatically, propelled by the relentless march of Moore's law,[24] a spike in federal funding in the wake of 9/11, and, most important, a new idea…experimenting with already-translated work known as parallel text."[25]

Analysis of parallel text (i.e., "text paired with its translation into a second language"[26]) has been critical for statistical MT (e.g., IBM's "BLEU" software, which will be discussed below), and statistical MT has, in turn, been integral for improvements in the quality and accuracy of MT. Parallel texts are generally drawn from massive collections of text available from major governmental or quasi-governmental organizations such as the European Union or the United Nations.[27] The bigger the collection is, the larger the amount of information that can be gleaned from it and the greater the accuracy of the probabilistic guesses that can be made. One can easily see the need for huge memory capabilities.

The consensus of the literature is that 99% "perfect" is the highest level any translation will ever achieve for HT and hence 99% is a fair benchmark for MT (i.e., the point at which HT and MT will be indistinguishable from each other).[28] A distinction between *translation* and *interpreting* should be made. Translation "refers to the transfer of meaning from text to text…interpreting consists of facilitating oral or sign language communication, either simultaneously or consecutively, between two or more speakers who are not speaking the same language."[29] It is interesting to note that translation is expected to be 99% accurate while interpreting is only expected to be about 80% accurate.[30] It appears that the quality of MT in 2012 is equal to that of interpreting.

One of the greatest issues in achieving the quantum leap in MT is storage, because:

> part of the reason accuracy rates for machine translation have crept along at a snail's pace until now is that translation software needs a very large database of text for training and for comparing similar phrases to extract meaning. Huge increases in storage capacity have greatly boosted the size of such databases.[31]

Until the turn of the 21st century, MT was accomplished at translating words. Since then, MT researchers have started focusing on phrases, which have posed fewer problems[32] and are the most successful.[33] Translation is "much easier if you're working in phrases because one of the biggest problems is ambiguity…Individual words are very ambiguous, but whole phrases, especially in a particular context of use, are not really ambiguous."[34] As will become evident later in this article, the translation team

encountered this exact problem: how to translate single words with no context. That was the most daunting task for the human translation team; imagine what a daunting task that is for MT.

Current applications of devices relying on phrases include NEC Corporation's PaPeRo (Partner-type-Personal-Robot) hand-held two-way PDA e-Navi, and the Phraselator one-way (English to Arabic) translator developed for use by American troops in Iraq.[35]

At present, there are essentially three types of MT: (1) rule-based, (2) statistical, and (3) hybrid.[36] Rule-based MT is "the traditional system based on specific grammatical and other linguistic rules, supported by subject matter glossaries…are more useful when the text contains more controlled language that follows stringent style and terminology guidelines; Statistical MT, a new approach, generates translation based on a corpus or collection of human translated documents, which uses an MT engine to search for parallel phrases or paragraphs across languages and ranks them by probability of occurrence. The larger and better the quality the corpus, the better the results; Hybrid MT leverages the strengths of both statistical and rule-based MT."[37]

All of these current technologies are still not good enough, and "should be post-edited,"[38] and post-editing MT rather than using HT only provides cost savings to companies. Chrysler, for example, "lowered its translation costs by 35% and increased its translation productivity by using machine translation in combination with human post-editing of the MT output."[39] In the opinion of some, "We're only a few years away from Internet search engines that can return high-quality results translated from nearly every language around the globe…Eventually, software will be able not only to understand spoken language but also to act upon it."[40] Others are of the opinion that "It would take considerable advances in artificial intelligence to develop a software program able to grasp the extremely complex subtleties of human languages."[41] Nonetheless, progress is being made.

A key feature of progress in MT appears to be automated evaluation. MT evaluation is slowed when done by humans. Therefore, automatic evaluation of MT is similar to the concept of MT itself: machines evaluating machines are far faster than humans evaluating machines. From the literature, IBM's BiLingual Evaluation Understudy (BLEU) software appears to be recognized as the best for evaluating MT performance. Human evaluations are too time consuming and too expensive.[42] BLEU is hastening advances in MT through statistical probability (i.e., the ability to determine what is likely to be correct).

The focus group of this research was completed as planned, consisting of the four Japanese university professors from four different Japanese

universities. The group was small and the allotted timeframe was four hours. The focus group elicited key variables unique to conducting and managing a forward-back translation. The focus group concentrated on the translation issues encountered (i.e., English to Japanese forward-translation and Japanese to English back-translation). With regard to the validity and reliability of the international surveys created, a proper validation would require conducting a survey of 400 people in Japan for each of the six surveys being created. That would demand surveying over 2,400 people, and, prior to validation, a Measurement Equivalence/Invariance (ME/I)[43] would have to be conducted.

The focus group started promptly at 1:00 pm and continued until approximately 4:45 pm. A Sanyo ICR-PS503RM audio recorder was used to record the focus group discussion. Professor Sekiguchi uploaded the resulting three MP3 files to a Dropbox account located at http://www.dropbox.com on November 29, 2011. The resulting MP3 files contained 71.69 MB, 59.37 MB, and 20.02 MB of data for a total of 151.08 MB of space. The recording was later transcribed, which required roughly one hundred hours of typing.

The MT, which would be compared to the HT undertaken, was conducted prior to receipt of the translation-team translations. The author of this article attempted to conduct MT of the JDI material. The 30-day trial version of Fujitsu's ATLAS Super Pack V14 computer software was used and the following free online translation resources were also used: http://www.worldlingo.com, http://www.babelfish.com, http://www.foreignword.com, and http://translate.google.com.

The intent was to conduct the exact same translation that the translation team conducted and come up with a comparable result. Conducting a machine translation of the entire set of JDI material *en masse* proved impractical; therefore, Japanese-to-English MT of a Japanese-language email received from Professor Sekiguchi was conducted using all four of the above-cited Internet sites and Atlas software. Some greater utility was sought of MT to relay information from one language to another that would otherwise not occur without MT when HT is not available, or, even in the case of HT availability, some other value of MT that surpasses HT.

The first issue in conducting MT was what software to use. The second matter was cost. After I searched the Internet for English to Japanese (E to J) and Japanese to English (J to E) software, it became apparent that a premier product was Atlas V14 produced by Fujitsu. The purchase price for the ATLAS Super Pack V14 varied from USD 1,000 to USD 1,700, depending on the vendor.

The following text was taken from one of the six surveys being translated (i.e., the first column of the Retirement Descriptive Index [RDI]). The original English text is simple, clear, and straightforward. MT was expected to be easy. This seemed an opportunity to achieve a mirrored forward-back MT. It was anticipated that this would not be difficult to accomplish.

Only one out of eighteen words matched exactly, one word translated into *romaji* (i.e., the Western alphabet as it is referred to in Japan), and several words translated into good hints (e.g., "exciting" to "it gets excited"). The "mirror" was definitely cracked; the semblance between Original English Text and Back MT was limited at best (see Table 1).

Table 1. Forward-Back Machine Translation

Original English Text	Forward MT	Back MT
Tiresome	退屈	Boredom
Discouraging	がっかり	[Gakkari]
Exciting	興奮させます。	It gets excited it.
Good	利益	Profit
Fascinating	心を奪います。	It fascinates it.
Hard	困難	Difficulty
Boring	くり抜きます。	It hollows.
Challenging	挑戦します。	It challenges.
Interesting	おもしろい	It is interesting.
Useless	役に立たない	It is useless.
Limited	株式会社	Company
Same thing every day	同じものは毎日です。	The same one is every day.
Creative	創造的	Creative
Nothing to do	何でもありませんする。	It is done that there is nothing.
Nothing to look forward to	何でもありません楽しみにしている。	It makes it to the enjoyment that not is.
Relaxing	リラックスします。	It relaxes.
New things to do	する新しいこと	Be new ..doing...
Gives sense of accomplishment	達成感を与えます。	The sense of accomplishment is given.

Technical editors seeing this would be responsible for informing their supervisors or the entities that hired them that they are unable to discern accurately the precise relationships between Original English Text and Back MT. A responsible technical editor would conclude that post-MT English editing in this instance did not work and for a legitimate forward-

back translation to be accomplished, HT would have to be performed. Nonetheless, the resulting MT does appear to offer a quick means of assessing resources needed for a particular project. The resulting MT is also very useful for resource allocation, which provides a valuable assessment of what it will take to get a certain translation done. This is usually a topic of great concern to everyone: what will be required to accomplish a proper translation and is it worth paying for a proper translation?

Furthermore, trained editors who are also bilingual might be able to claim the right to perform post-MT editing to give an opinion on the merit of the Japanese translation since they can read and understand the translated text, suggesting that forward-back MT can be accomplished only by a bilingual Japanese-English technical editor and a monolingual technical editor is not appropriate for forward-back MT. A bilingual editor is necessary if a particular translation project insists on sticking with MT only. If forward-back MT does not work as a tool for monolingual technical editors, questions arise regarding what benefits forward-only J to E MT offers monolingual technical editors. To test the potential benefits of forward-only J to E MT for monolingual English editors, an actual email from Professor Sekiguchi was used.

A Japanese-language email from Professor Sekiguchi (team leader of the four-person team of Japanese university professors hired to conduct the JDI translation) to Professor Katsumata is shown below. Most of us cannot read *kanji* (Japanese pictograph written characters) and therefore have no idea what the content of this email might be. Free translation software was used from the Internet. In particular, the capabilities of the following sites were tested: http://www.worldlingo.com and http://www.babelfish.com. These were chosen based on their supposed abilities to go from J to E literally (i.e., copy J, paste J, click "translate," and see E). Here is Professor Katsumata's original email along with the translations from worldlingo babelfish, and foreignword:

> 国際医療福祉大学　勝俣先生
> 　はじめまして。大阪大学の関口と申します。GregoryGreerさんの修士論文に伴うJDI尺度の翻訳作業をお引き受けしております。
> 　すでにご存じのことと思いますが、Gregoryさんの来日にあたって、Focus Groupを、11月25日（金）に、法政大学にて実施する予定でございます。
> 　実施するお部屋など詳しい内容につきましては後日お知らせいたしますが、法政大学（市谷キャンパス）までのアクセスについては、以下のとおりになっております。
> 　http://www.hosei.ac.jp/access/ichigaya.html

〒102-8160
東京都千代田区富士見2-17-1
TEL：   03-3264-9240
【JR線】総武線：市ヶ谷駅または飯田橋駅下車徒歩10分
【地下鉄線】都営新宿線：市ヶ谷駅下車徒歩10分
【地下鉄線】東京メトロ有楽町線：市ヶ谷駅または飯田橋駅下
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徒歩10分
【地下鉄線】都営大江戸線：飯田橋駅下車徒歩10分
どうぞよろしくお願いいたします。
大阪大学　関口倫紀

Just by teasing out the Roman characters and the Arabic numerals, any English reader could ascertain that something involving Gregory Greer, a Focus Group, and Hosei University is involved. Unless you are capable of reading Japanese, the rest of what has been written can only be guessed at. Can MT effect a cogent translation? From http://www.worldlingo.com, the following translation resulted:

Mr. international medical welfare university Katumata,

beginning.You say Sekiguti of the Osaka university.We have undertaken the translation job of the JDI scale which accompanies the master dissertation of Gregory Greer.

Already, you think that which you know, but Focus Group, on November 25th (Friday), at the Hosei university it is the schedule which is executed at the time of the visiting Japan of Gregory.

Future it does to inform concerning detailed contents such as the room which it executes, but we have become as follows the Hosei university (the Ititani campus) to concerning access.

http://www.hosei.ac.jp/access/ichigaya.html

〒102-8160

Tokyo Chiyoda Ku Fujimi 2-17-1

TEL: 03-3264-9240

<JR line> Entire military affairs line: Ichigaya station or Ida bridge station getting off walking 10 minute

<Underground wire> Capital barracks Shinjuku line: Ichigaya station getting off walking 10 minute

<Underground wire> Tokyo metro Yuraku Cho line: Ichigaya station or Ida bridge station getting off walking 10 minute

<Underground wire> Tokyo metro east west line: Ida bridge station getting off walking 10 minute

    <Underground wire> Tokyo metro north and south line: Ichigaya station or Ida bridge station getting off walking 10 minute
    <Underground wire> Capital barracks large Edo line: Ida bridge station getting off walking 10 minute
    we ask please may.
    大阪大学　関口倫紀

Using babelfish.com the following instant translation resulted:

Subway Oedo line - line - is a 10-minute walk from Iidabashi station: 10 minutes walk thank you very much Iidabashi Sta. JiLunSekiguchi, Osaka University

    The worldlingo translation reveals quite a story, while the babelfish translation discloses very little. The MT tests of these two sites failed: one told a vast story, while the other told almost nothing. Furthermore, in the first test, Japanese characters appear at the very end. Why did those characters not translate? They are at the very end and might be the most important piece of information in the entire email: the name of the sender. The results beg a second test using a third source of MT. Perhaps reverting back to the original Fujitsu software is the answer.
    The following was the result of copying and pasting the Japanese text into the free 30-day trial version of Atlas V14:

????????
?????
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Gregory Greer??????????
JDI???????????????????
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Gregory???????????
Focus Group??
11?25?(?)?????????????????????
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(???????)
??????????????????????????
http://www.hosei.ac.jp/access/ichigaya.html
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2-17-1
TEL:
03-3264-9240
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At least the Roman characters and Arabic numerals showed up. Aside from that, this translation is useless. An additional attempt was made via another free MT resource. From http://www.foreignword.com, the following resulted:

Mr. international medical welfare university Katumata, Beginning. You say Sekiguti of the Osaka university. We have undertaken the translation job of the JDI scale which accompanies the master dissertation of Gregory Greer. Already, you think that which you know, but Focus Group, November 25th (the gold), at the Hosei university it is the schedule which is executed at the time of the visit to Japan of Gregory. Future it does to inform concerning detailed contents such as the room which it executes, but we have become as follows the Hosei university (the Ititani campus) to concerning access.
http://www.hosei.ac.jp/access/ichigaya.html 〒102-8160 Tokyo Chiyoda Ku Fujimi 2-17-1 TEL: 03-3264-9240 Entire military affairs line: Ichigaya station or Ida bridge station getting off walking 10 minute Capital barracks Shinjuku line: Ichigaya station getting off walking 10 minute Tokyo metro Yuraku Cho line: Ichigaya station or Ida bridge station getting off walking

10 minute Tokyo metro east west line: Ida bridge station getting off walking 10 minute Tokyo metro north and south line: Ichigaya station or Ida bridge station getting off walking 10 minute Capital barracks large Edo line: Ida bridge station getting off walking 10 minute We ask how do you do. The Osaka university Sekiguti倫 period

MT very similar to the worldlingo MT resulted, and it appears that the final Japanese characters that worldlingo did not translate were the name of the sender of the email, Professor Sekiguchi. However, http://www. foreignword.com also failed to translate everything: one Japanese-language character remains un-translated. That defeats the whole purpose of any translation: *everything* must be translated.

In a final effort to uncover the very last Japanese-language character that none of the free online MT software translated, http://translate. google.com was tested. The results follow:

Mr. Katsumata 国際医療福祉大学,

Hajimemashite.My name and Sekiguchi, Osaka University. We undertake the translation and scale due to the JDI's thesis Gregory Greer.

I hope you already know that, when Japan's Gregory, the Focus Group, November 25 (Friday), will be conducted in our Hosei University.

For details such as rooms will be announced at a later date to implement, Hosei University (Ichigaya Campus) Access to information is ordered as follows.

http://www.hosei.ac.jp/access/ichigaya.html

〒 102-8160

2-17-1 Fujimi, Chiyoda-ku, Tokyo

TEL: 03-3264-9240

Sobu Line] [JR: 10 minutes walk from Ichigaya station or Iidabashi Station

Subway Toei Shinjuku Line] [Line: 10 minutes walk from Ichigaya Station

Subway Line: Tokyo Metro Yurakucho Line - 10 minutes walk from Ichigaya station or Iidabashi Station

- [Tokyo Metro Tozai Line subway line 10 minutes walk from Iidabashi station

[] Tokyo Metro subway line Nanboku: 10 minutes walk from Ichigaya station or Iidabashi station

Subway Oedo Line] [Line: 10 minutes walk from Iidabashi station

Thank you.

JiLunSekiguchi, Osaka University

In this instance, the ending *kanji* appears to have been translated, but now the beginning of the translation has not been done completely.

Based on the results of the five MTs conducted on the same email, it appears that the use of multiple MTs might relay 95% or more of the intended message, but no more. It appears that at least 5% of the information will not survive MT, and this matter must be countenanced whenever MT is used for a quick translation of emails. Although MT is good for emails, it is not great for emails. MT can help, but MT cannot be trusted as a final tool, particularly when near-perfection is required (such as when translating medical information).

The final forward-back HT was uploaded to Dropbox on October 26, 2011. In the words of the translation team leader, Professor Sekiguchi, the following occurred:

> "Sekiguchi and Hayashi conducted E to J translation and Takeuchi and Nakagawa conducted the J to E translation. Sekiguchi passed Takeuchi the Japanese version and he added English translation to the draft. The pattern is the same for Hayashi-Nakagawa team. Each member worked independently and did not discuss anything about how to translate or so. If you look at the English in the draft, you can find how the original English version has changed after the translation-back translation procedure."[44]

After inspecting all 52 pages of the forward-translation batch and the back-translation batch of surveys, the first thought that came to my mind was what a hodge-podge it was. The visual appearance was nothing short of a motley assortment of Japanese text juxtaposed with English text.

Although the original intent was to create, in a single phase (forward-back translation), six international surveys that would require minimal additional work in order for them to be ready for validation and subsequent use in Japan, it became obvious that one phase to reach this goal would be insufficient. Two additional unforeseen phases would be required, and, even then, validation would have to occur before the surveys could be recognized as legitimate international surveys.

Phase 1 was completed but a new, unforeseen Phase 2 (i.e., a collaborative analysis by all four translators of the forward-back translation as well as agreement on the final Japanese-only text for the finished surveys), and Phase 3 (graphic design to create a commercial product) were necessary.

Table 2. Phases Required for Completion of Ready-To-Use Japanese JDI Material in Japan

Phase	Task
1	Forward-Back Translation
2	Compilation of Forward-Back Translation by Translation Team
3	Submission to Graphic Designer to Create a "Commercial" Product
4	Measurement Equivalence/Invariance (ME/I) Test
5	Validation
6	Publication in a Scholarly Journal Announcing Validation
7	Ready for Users in Japan (as Legitimate International Surveys)

Phase 4, conducting a Measurement Equivalence/Invariance (ME/I), was not expected and was only uncovered after making inquiries with the appropriate subject matter expert (SME) in the field of Industrial-Organizational Psychology. Phase 5 was expected,[45] but both Phases 4 and 5 are beyond the scope of this research, as is Phase 6, which became obvious after reviewing the literature on similar forward-back translation efforts in which validation was conducted. Such validation appears to be the accepted scholarly means of announcing a new international survey.

Notwithstanding taking one step forward (i.e., Phase 1), two unforeseen backward steps were taken: waiting for the translation team to compile the draft forward-back surveys into final material, and hiring a graphic designer to create a commercial product. The necessity of undertaking validation was foreseen, but no validation was planned. This study was designed to create surveys ready for validation. Two minor setbacks and one major setback became evident, and it is the job of a professional writer-editor to point out setbacks and recommend resolutions.

Further analysis of the fifty-two pages of forward-back translated surveys revealed that dozens of months of time would be needed to create a final commercial product. That effort would require collaborative communication among professors Sekiguchi, Hayashi, Nakagawa, and Takeuchi, none of whom live near one another, and, aside from the focus group in November, do not gather at one physical place. Accordingly, undertaking a collaborative analysis of the material in order to create the final material will not be a simple matter. Finally, subsequent to that process analysis and creation of eye-pleasing surveys by a graphic designer will be needed before the ME/I test is conducted.

For the actual breakdown of the forward-back HT that occurred, two pairs of forward-back translators were created. Professors Sekiguchi and

Takeuchi worked together as did Professors Hayashi and Nakagawa. Individual professors did not talk to one another while they worked; translations were conducted independently.

The results of the focus group proved most informative, particularly with regard to MT, which was not the intent of the forward-back HT that was conducted. Immediately after asking the first focus group question (Now that the translation is done, if you had it do over again, what would you do differently?), without any prodding or mention of machine translation, the first thing that was offered was "Maybe I'm going to use an electronic dictionary."[46] The responder, Professor Sekiguchi, then referred to the use of online dictionaries. Not once in any communication with Professor Sekiguchi was there any mention that machine translation would be a sub-topic within this translation effort, yet that was the first topic that was brought up by the translation team. Everyone on the team agreed with Professor Sekiguchi: the use of MT from the beginning would have made it much easier for the individual members of the team to do their work. Initially, the members relied on themselves only, thinking that they would be able to do the translation with their minds only. The lesson learned from this response is that MT can be considered integral to translation. When working with translators, when asked questions on how to properly conduct a translation, editors would be wise to recommend the use of MT. In fact, editors would be wiser still to run their own MT tests on the material they are working with, if for no other reason than to get a sense of the material.

Professor Sekiguchi continued speaking on behalf of the group and explained the reasoning behind the need for machine translation: finding the precise Japanese equivalent word for the original English one. (The original JDI surveys in English consist of single words only, more than seventy for the JDI.) Apparently, finding the same single word in Japanese was not as simple as originally anticipated by the translation team and the use of electronic resources at the start rather than later would have been helpful. This is another lesson for editors: be wary when working with translations involving single-word items. Editors might be responsible for reporting that the integrity of the translation is questionable and hence requires deeper analysis, possibly including another independent translation and comparison of the two.

As expected, however, all of the members of the translation team agreed that the new Japanese JDI had experienced a metamorphosis of sorts: the new JDI material can be considered pure Japanese. Every member of the team repeatedly reiterated that the translation had been done very rigorously, and when asked the second primary question (What

would you tell a colleague about the JDI translation material?) the group was adamant that once the raw forward-back material is compiled into the final product, it will be reliable. Reliability is another issue an editor needs to be aware of. What is *reliability*? As mentioned previously, for the JDI surveys to be considered valid and reliable a very stringent ME/I via mass survey and subsequent statistical validation (also via mass survey) would have to be conducted on each of the six new surveys. What is the relationship of the post-translation editor to this validation process? Is he or she responsible for informing about this additional work? In the case study presented in this article the translation might be considered intrinsically reliable, but the translated surveys cannot be recognized as legitimate international surveys unless a ME/I test is conducted. Editors working on material of this nature need to be aware of this and might be responsible for reporting such facts. This is a typical issue in a corporate setting.

The third primary question (Assuming that the new JDI material can talk, what would the new Japanese JDI say?) was posed to elicit from the group what the new Japanese version of the JDI surveys inherently say about themselves. The group reiterated the metamorphosis mentioned earlier by saying that the surveys would indicate, "I'm Japanese." It appears that the translation team is well on its way to finalizing six new international surveys in Japanese for use in Japan. Nonetheless, that is not good enough, and a well-versed editor would be responsible for reporting this fact. The six new surveys might have "become Japanese," but they are not yet valid international surveys. The only thing that happened was a forward-back translation. The surveys can only be accepted as valid and reliable international surveys after the ME/I and validation, both of which are major undertakings likely costing ten to fifteen times the cost of the forward-back translation. Discovering such a need for ME/I and validation can be said to be a fair example of a responsibility expected of a senior technical editor: determining what remains to be done. Editing is not hand-to-paper-alone work; advanced technical editing requires thinking well beyond the printed text. This responsibility requires that a senior technical editor foresee and predict implications and uncover what is not regularly observable.

The fourth question was the hardest question for the group (If you could change one thing about the Japanese JDI what would you change?) This actually stumped the group as was evident by Professor Sekiguchi's comment, "It's a pretty difficult question," and the group's overall response of "One thing?"[47] The group wanted to change many things about the new Japanese JDI surveys. Nonetheless, a direct answer was

sought: which one thing would the group change? The most irksome issue for the translators appeared to be the similarities between items on the scale, such as the differences among "good," "very good," and "excellent." Professor Sekiguchi and the group could easily distinguish *good*, *very good*, and *excellent* when the group was in English thinking mode; however, when in Japanese thinking mode the group had difficulty coming up with Japanese equivalents. To them, expressing *good*, *very good*, and *excellent* as three distinct Japanese terms was not a simple matter. Although the group wanted to change many things about the Japanese JDI material, the one thing the group members did agree that they would change was making the surveys shorter.

This serves as a further example of something editors must understand: the thinking of translation teams with whom they are working. What does the translation team think? What does the translation team recommend? How does this impact the new product? What inherent risks arise with regard to the trustworthiness of a translation (i.e., what possible liberties did the translators take and is the resultant new product trustworthy)?

It was interesting to note that the group found the use of the Yatabe-Guilford (YG) scale preferable, as opposed to use of the Likert scale. YG is the three-part *Yes*, *No*, or *?* scale as opposed to the circle-one-of-five-items Likert scale. The YG scale is used on the JDI surveys. Three is shorter and easier than five, and the group agreed that YG is much simpler and appropriate for Japanese users. This is in accord with the mindset of any responsible editor: brevity, brevity, brevity, conciseness, conciseness, conciseness—less is more and fewer is better. The YG scale appears to be respondent-friendly, something that is coveted in Japan: ease of use by the users, not the designers. The only focus should be on the customer. This finding of ease of use of the YG is another example of key positive variables being teased out of a new product that a senior technical editor would be required to uncover and describe. The ability to point out the functionality of a product is one of the greatest skills an editor can provide.

When distributing a commercial product the goal is to maximize sales volume. Editors in private industry are an essential part of the process of creating a final product that is ready for market. Indeed, a senior technical editor (and often a junior technical editor) is usually one of the very last people among three or five employees to work on a product immediately prior to the product's release. The question, If you were responsible for selling one thousand copies of all of the translated material in CD form, what key point would you stress in the advertising campaign?, produced results that serve as another opportunity for anyone wishing to become a senior technical editor: determining utility—what, how, and for whom.

Professor Hayashi felt that the surveys would be good diagnostic tools that would allow companies to diagnose the state of their organizations. This raises a theme that resounded throughout the entire focus group. The author expected the four university professors to be focused solely on the use of the JDI material within academia; however, their awareness was much broader. The resounding theme throughout the focus group discussion was the applicability of the new Japanese JDI material to Japanese companies. Academia was, of course, mentioned, and purely theoretical research was considered, but the primary thinking of the group addressed the practical use the JDI material would have for the greatest number of people in Japan as manifested in the use of the JDI by Japanese companies. The group's concern was not what the surveys would do for them. Instead, the group's focus was on what the group could do for the surveys. This is the type of evaluation for which a senior technical editor is responsible: being cognizant of the broader applicability of the completed work product and being able to provide immediate answers. Immediacy is a tremendous factor in private industry and in government: timeliness, timeliness, timeliness, accuracy, accuracy, accuracy are the bywords of the practicing technical editor whose work transcends the product per se and often deals with the very survival of the organization he or she is representing.

Question 8 (What does someone using this product need to know in order to accept it?) addresses the applicability of the final work product. The group pointed out that the surveys would not only be useful for the respondents (i.e., company workers), but also for company management. (Notice again the indication of the JDI material as useful material for companies.) The end result appeared to be that improving job satisfaction in companies will help companies achieve their primary goal: increasing sales. An up-and-coming senior technical editor would do well to absorb this lesson and foresee future opportunities to point out such items in a professional environment.

Any technical editor can glean much by reviewing the answers to Questions 10 through 14, which focus on how the group approached the translation; how the work was distributed; what individuals actually did and what they would do differently; what tools were used; and what problems were encountered. As expected, everyone worked independently. That is the point of a forward-back translation: no one translator is supposed to talk to another translator while doing the translation. That is how everything is checked in forward-back translations. One professor printed out the material; another did everything electronically. Two members performed E to J translation; the other two performed J to E

translation. Some members used online dictionaries; others relied on themselves. Some researched comparable material in related journal articles (i.e., pre-existing material). Professors Hayashi and Nakagawa were one forward-back team, professors Sekiguchi and Takeuchi were the other team. The members of the group universally agreed that they would not change anything about the arrangement of the group and the process that was completed. There were no technological problems. As previously mentioned, the only problem was deciding on precise Japanese words based on the given English words. For example, *boring* in English translates to *omoshirokunai* in Japanese; however, Professor Takeuchi indicated that in Japanese *omoshirokunai* can also mean *uninteresting* or *not funny*. Note again the prominent problem identified by the focus group: deciding on the final Japanese words to be used in the JDI.

Editors need to be aware of translation teams' expectations. Question 16 elicited an excellent example of a translation team's expectations. The only differences the group had between what they expected the translation would involve and what it actually involved was the amount of time it would take to do the translation: for some members it took less time than expected, for other members it took more time than they expected.

A review of the B-list of questions provided insight into the end results of technical editors' duties. For example, Question B-1 (What future do you see for the JDI in Japan?) resulted again in references to companies, not necessarily universities, using the JDI material.

The group's response to Question B-2 (Which among the six surveys translated do you think is the most appropriate for Japan?) did not yield one group answer, but instead three unique answers. Two members felt that the JDI survey alone was the most appropriate for Japan, while one member felt the TIM was appropriate, and one member felt that the SIG was the most appropriate. Actually, it was thought that the RDI would be appropriate for Japan since there are so many retirees in Japan. This raises another interesting issue: not once during the entire focus group time did anyone bring up the SOLS survey. Maybe the SOLS is simply not appropriate for Japan. Based on discussion the group, it appears that the JDI, TIM, and SIG are the most appropriate surveys for Japan. The JIG, aJDI, aJIG, and SOLS appeared to be of less interest to the group. Also, the JIG is incorporated into the JDI survey. All of these acronyms and the similarities of each of the JDI family of surveys to each other become very confusing. It is the job of the practicing technical editor to keep it all crystal clear. The fact that it became evident that the SOLS was deemed the least important, and that there was a sort of delineation of the status of the surveys in the minds of the focus group members demonstrates the

success of the focus group: the ranking of the final products. Table 3 presents an approximation of the apparent ranking in the minds of the translation team.

Table 3. Apparent Ranking of the Value of the JDI Surveys in Japan

Surveys	Ranking
JDI/JIG[48] or aJDI/aJIG[49]	1st
SIG, TIM	2nd (Tie)
RDI	3rd
SOLS	4th

This is precisely the type of judgment call a senior technical editor working on comparable material would be expected to make: determining the best among similar products to send to market.

Professor Sekiguchi alone did the forward-only translation of the Quick Reference Guides. No back-translation was necessary. Professor Sekiguchi answered Question B-3 (What about the translation of the Quick Reference Guides?) and confirmed that quick reference guides would be sufficient as instruction materials for the final surveys. This is an example of information that a technical editor would need to provide to management about supporting material.

The group agreed that validation is the next step for the JDI (Question B-4: What is the next step for this?); however, the members of the group indicated that they would not be able to do the validation and that they were not familiar with the actual next step prior to validation: the ME/I test. At the level of professional responsibility a senior technical editor (not an entry-level technical editor or a junior technical editor) assumes, knowing information or being able to determine needed information is expected. The translation team and Professor Katsumata were familiar with validation, but none were familiar with ME/I. It was only after making the necessary contacts (i.e., contacting a preeminent authority on survey validation) that it became known that ME/I was necessary before validation. This raises a final point: in order to ascend to and maintain the status of senior technical editor, editors have to make contacts or, at a minimum, learn how to work with subject matter experts (SMEs) and extract technical information from them. SMEs have all of the information, and the editor might not even understand the truly technical information; nonetheless, he must learn how to work with SMEs. Determining who the SME is and who has the precise information you need is one of the greatest challenges that any editor will face.

Furthermore, often what is not said by SMEs is just as important (and often more important) than what is being said. It must be understood by editors that SMEs are frequently reluctant to give out information, particularly since the information they have is so valuable and whoever possesses it effectively controls it. Senior technical editors must listen to both what they are and are not being told.

This article predicts that something dramatic will happen with MT sometime in the not-too-distant future, which will likely transform the entire concept of communication to the point that anyone, anywhere in the world, will be able to instantly communicate with anyone else in the world. The concept of communication will likely be standardized everywhere. If the same ongoing zeal and monetary resources continue to be given to MT, it is predicted that HT output and MT output will be indistinguishable from each other by 2100.

For the present and foreseeable future, sophisticated translation into Standard Edited American English requires American English Professional Writing and Editing (PWE) as performed by American English technical editors specially trained in American English editing. Once the quantum leap in MT occurs, the role of the technical editor will be different; however, that role will be no different than the role of an editor today who edits in-language-only documents, such as technical editors working domestically on text with no translation associated with it.

This study found that many different types of MT are available, and it is up to individual users to determine which MT works for their task. It was realized that MT is a powerful tool for monolingual individuals to use in a professional setting (i.e., being able to decipher foreign emails received).

The final conclusion drawn from this study is that although MT cannot produce the same ultra-accuracy that HT produces (i.e., 99%), there are benefits to be had from both MT and HT. MT and HT are neither equal to each other nor better than each other. Both are different tools to be used at different times for different purposes. Actually, they appear to be symbiotic, not independent, and are best used simultaneously. The status quo of MT is comparable to the status quo of American grocery store self-checkouts: they do not work yet they are there and they are used. Go to any American grocery store on any Saturday morning and observe the activity at the self-checkout cash registers; sooner or later, a human cashier will have to take over an automated transaction that is supposed to be accomplished without a human cashier. Does that mean that all self-checkouts in every American grocery store should be shut down? No, they obviously provide a benefit since they are so common and regularly used.