



Translation Memory Technology Assessment

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Government User Session



Topics

- **Introduction**
- **NVTC Requirements for Multi-Genre Translation**
- **Motivations for TM Technology Assessment**
- **Pilot Study**
- **Results**
- **Collaboration with NIST**



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Report Documentation Page

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NVTC Mission



To provide timely, accurate translation services
for the security of the nation



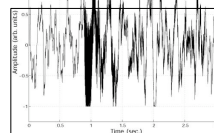
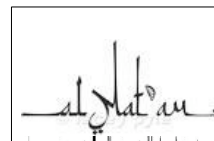
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NVTC Services



- **Translation**
 - English to target language(s)
 - Foreign language(s) to target language(s) – usually English
- **Transcription**
 - Audio
 - Video
- **Summarization**
- **Gisting**



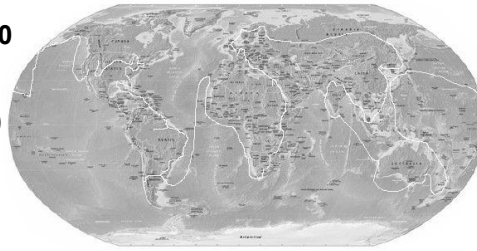
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NVTC Languages (2008)



- Translated for approx. 30 U.S. Government entities
- Translated from more than 50 Languages
- Translated into more than 70 languages



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Genres



Examples:

- Book chapters
- Journal articles
- Web news articles
- Email messages
- PowerPoint slides
- Brochures
- TV broadcasts
- Radio broadcasts
- Maps



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Motivations for TM Technology Assessment



- **Application of TM technology**
 - **Industry**
 - **Automobile industry** has documented return on investment for updating the translation of auto manufacturing manuals for off-shore assembly plants
 - **Standardized terminology** for Parts and Components Suppliers
 - **Example**
 - **General Motors**
 - **Languages:** English to German, European Spanish, Canadian French, Italian, Mexican Spanish and Dutch



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Motivations for TM Technology Assessment



- **NVTC also translates manuals:**
 - **U.S. Army field manuals** from English to Arabic and other languages to train Iraqi Security Forces and other coalition partners.
- **NVTC translates many other genres as well:**
 - **Journal articles, news stories, broadcast interviews, memoranda, emails, web sites, PowerPoint slides, etc.**



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Translation Memory Technology Assessment: Pilot Study



Goals:

- Develop TM assessment methodology using 3 common languages
- Develop candidate performance metrics for assessing TM usage across genres (e.g., translation speed, number of QC edits)
- Develop candidate linguistic parameters to characterize genres (e.g., sentence structure, morphology)
- Initiate development of TM memory banks for 3 languages

End goal:

- To determine if and under what circumstances using TM technology will result in improvements in translation speed and accuracy when translating IC and DoD documents in the NVTC workflow



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NVTC – Naval Research Laboratory Joint Research Partnership to Assess TM Technology



- NVTC
 - Data for translation
 - Translators, quality control professionals
 - Researchers
- NRL
 - Data for translation
 - Researchers
 - Joint Research Agreement (in progress)
 - First NRL joint agreement with the IC
 - First NVTC joint agreement with US Government research entity
- NIST
 - Assessment of experimental methods
 - IC/DoD Workshops
 - Metrics development

NIST



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Translation Memory Technology Assessment: Pilot Study



Languages	Documents	Memory Bank Source Data
Arabic and Chinese	Transcripts of broadcast news	Transcripts of broadcast news
Russian	Military journal articles	Unknown source

For each language:

- One control document translated by hand
- Three test documents translated using TM tool
- Two translators each translate four documents (control and test)
- Two QC professionals check the four translations, one QC professional per translator



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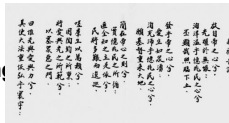


Translation Memory Technology Assessment: Pilot Study



Analysis Compare

- The quality of the translation for Arabic and Chinese.
 - Will highlight what linguistic criteria (e.g., sentence structure, morphology) might be relevant in characterizing genres.



Compare

- The quality of the Russian translations to the Arabic and Chinese translations.
 - Chinese and Arabic will show the effect of using a memory bank built from documents of the same genre as the translation source documents
 - Russian will show the effect of using a memory bank that is populated with unrelated genre segments.



Compare

- The control document translated “by hand” to the translation of the matching test document (comparable genre, length, and topic) using the TM tool.
 - Will give some measure of how much TM technology helps improve translation speed and accuracy for each language and genre combination.



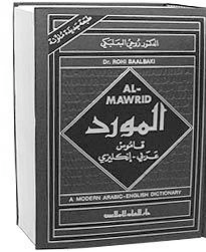
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What did we Measure?



- **Translator:**
 - **Usability (quantitative)**
 - Mouse clicks
 - Tool use log
 - Memory bank updates
 - **User assessment (qualitative)**
 - Questionnaires
 - After manual and TM-assisted tasks
 - **Controls:**
 - Used single (hardcopy) dictionary per language
 - Trained on TM system
 - **Quality Control Professional:**
 - **User assessment (qualitative)**
 - Questionnaires on each translation QC'ed
- Controls: not told which translations were purely manual**



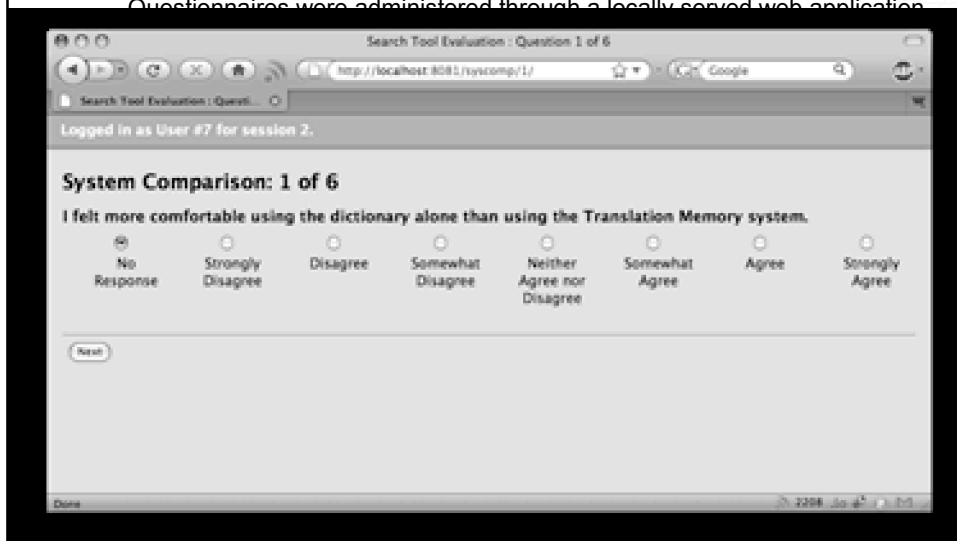
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Questionnaire System



Questionnaires were administered through a locally served web application.

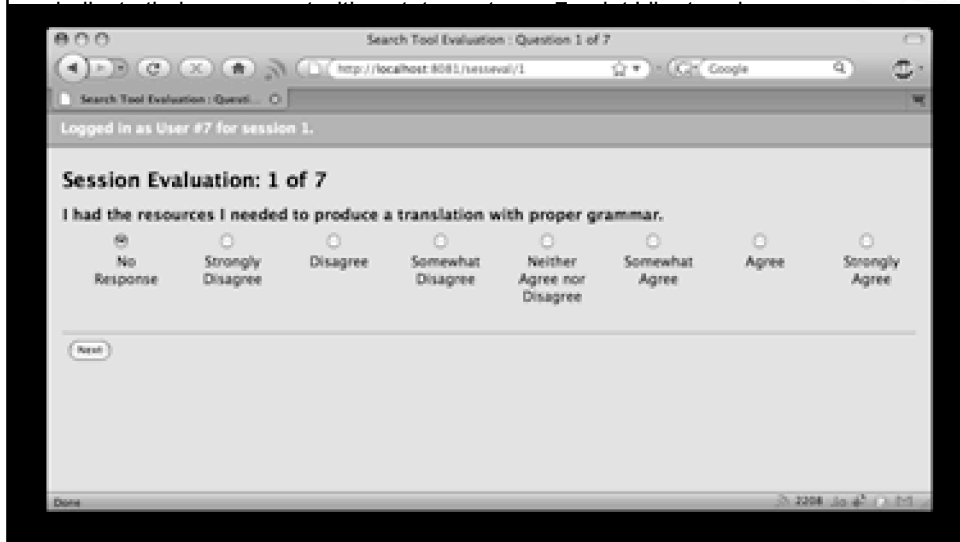




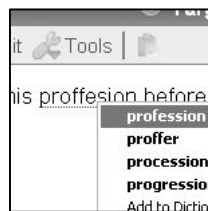
Questionnaire System



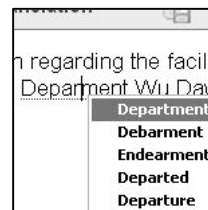
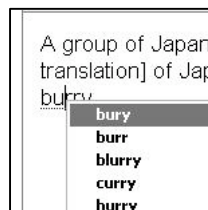
Apart from free-response prompts, all questionnaire items required the user to



Translators made extremely heavy use of the automatic spell-checker. We did not anticipate this behavior.



Russian-English translation.



Chinese-English translation.
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Software Evaluation Questionnaire: Conclusions

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VIRTUAL
TRANSLATION
CENTER

- Ignoring differences between sessions, users seemed to have a slightly favorable opinion of the TM system's:
 - Utility
 - ease of use
 - Information retrieval performance.
- This data is anecdotal, but suggests a trend:
 - Subjects' opinion of the system generally improved in later sessions
 - Further study with a larger group of subjects may produce statistically significant results.



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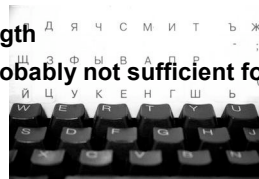
Observations

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- Translators are used to multiple internet sources, colleagues, specialized glossaries for terminology support
 - Limiting terminology source intended as control, but creates potential bias
 - Lesson learned: allow more access to open sources
- Translators improved use of TM quickly over a few days
 - Lesson learned: longer ramp-up time
- Native memory bank (the Russian memory bank resident in the commercial TM) was insufficient for Russian military journal articles
 - Rarely scored matches of significant length
 - Lesson learned: native memory bank probably not sufficient for domain and/or genre specific text.



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Collaboration with the National Institute of Standards and Technology (NIST)



- NVTC-NRL will present the pilot study TM assessment methodology and results to NIST.
- NIST will validate and refine the outcomes from the pilot study, resulting in:
 - A set of candidate performance metrics for measuring the translation improvement when using TM technology;
 - A series of workshops for researchers, developers, users, and other TM stakeholders;
 - An augmentation of the MetricsMATR series, or similar forum for TM metrics
- Meanwhile, NVTC-NRL will begin a memory bank for a 4th language (possibly from Africa) to use in follow-up assessment experiments.



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Translation Memory Technology Assessment: Follow-On Study



Follow-on Study

- Continue development of memory banks for all 4 languages
 - Arabic, Chinese, Russian, African language
- Add new genres
- Increase independence of experimental components
 - Pilot study measures effects of TM technology for assisting translators as individuals.
 - Follow-on study will better distinguish between the translator and the TM technology as the direct source of improvement
- Study the structure and use of memory banks
 - Investigate organizing memory banks by genre, topic, linguistic structure, or other criteria

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