PEMT in the Public Sector: Discovery, Scoping, and Delivery

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• 25+ years supporting commercial and government clients in over 200 languages and dialects
  - Translation and l10n, transcription, interpretation, language technology support, linguist placements, multimedia analysis and reporting

• Super user of Human Language Technology (HLT)
  - 20 years customizing language automation/HLT tools in 60 languages to achieve efficiencies, process voluminous materials, and provide cost savings
  - Leverage and adapt commercial products and combined tools to optimize technology to best meet customers’ needs
Presentation Objective

• Concerns about protecting data and challenges with implementation and measuring ROI have historically prevented public sector clients from using MT, CAT, and TMS

• We will show how our team successfully met client objectives while addressing data protection concerns to develop a practical, domain-specific Post-Edited Machine Translation (PEMT) solution to enable implementation by Public Sector clients.

Key Takeaways:
• How to develop a customized PEMT solution for Public Sector
• How to build and optimize TM corpora for statistical and neural MT training
• How to measure technological and procedural efficiencies for overall program success and scalability
Historical HLT Challenges for Public Sector (PS) Clients

• Limited HLT use due to various contract constraints
  ➢ No co-mingling of data, no data in cloud
  ➢ No data (TM/TB) retention
  ➢ CONUS resources with citizenship, various clearance levels
    • HLT use was not widespread among PS linguist base (freelance)

• No process automation
  – Longer production timelines
  – Project-based translation
Early Steps

- Secure isolated IT infrastructure
- Dedicated enterprise-level CAT setup
- Centralized TM/TB
- Training for resources, e.g. CAT-trained linguists/project managers
- TM/TB corpora included as a deliverable
Case Study

- **Objective:** Translate multiple domain-specific content streams with more automation and increased speed
- Large-volume legacy material alignment
- Geographically dispersed workforce
  - MGPS
  - Client stakeholders
  - Linguists
Program Requirements

• Centralized HLT Resources
  ➢ Projects
  ➢ Integrated Domain-Specific Machine Translation
  ➢ Translation Memories/TermBases
  ➢ Tech Support/Strict IT Infrastructure Requirements

• Integrated Project Management

• Data and Personnel Security
  ➢ Dedicated HLT resource instance
  ➢ Controlled human access

• Continuous MT improvement cycle

• Process automation

• Seamless integration of cloud and local-install HLT solutions
ANSWER?

Cloud-Based Post-Edited Machine Translation

• Post-Editing CAT/MT hybrid solution in an integrated TMS environment

• The Benefits of PEMT
  ➢ Faster processing time than CAT alone
  ➢ Greater consistency of terminology and style
  ➢ Future leveraging and ROI
  ➢ Workflow customization and efficiency
Define Stakeholders and Budget

• Dedicate a representative team of production experts – include the client!
  ➢ Get early buy-in from the future production team
  ➢ Start building the TMS operations culture
  ➢ Let the production-side stakeholders define a business case and the best solution

• Align Budget and HLT options
  ➢ Define Scope and Level of Effort - manage budget and expectations
  ➢ Calculate HLT costs (CAT/TMS/MT)
  ➢ Determine IT setup (local install vs. SaaS)
Challenge

There are a growing number of strong HLT solutions. How do you select the right one, and how do you implement effectively?
Choosing/Validating the Right Solution

• Perform preliminary research
  ➢ What do I need?
  ➢ What are my options (commercial/custom/open source)?
  ➢ What are my community peers saying?

• Choose solution candidates

• Set up orientation calls with solution developers
  ➢ Identify dedicated contacts for technical and contractual questions
  ➢ Explore data security options for data and support
Choosing/Validating the Right Solution (cont.)

- Create an evaluation matrix
  - Use the same criteria to evaluate all products
  - Standard criteria include:
    - Key features
    - Benefits
    - Shortcomings
    - Technical and contract support
    - Deployment options
    - Costs
PUT THE DATA ASIDE – TIME FOR WHITEBOARDING!
Whiteboard Your Workflows

- Define and document/update existing production processes
- Do *not* adjust workflows based on the solutions’ limitations
  - *If it doesn’t fit, it’s not right for you*
- Generate a master workflow that addresses the variations
  - Define production steps as “required” or “optional”
- Whiteboard other business requirements/expectations
  - Manage expectations
See What “Fits” – Select and Acquire

- Combine your research with your master workflow and business requirements
- Identify the solution that provides the most value
- Generate TMS/MT Selection Report:
  - Fund the acquisition and deployment
  - Maintain technology knowledgebase
  - Validate your decision
- Finalize the deployment plan
- Minimize the time between the acquisition and production deployment
Initial Configuration

• Master production workflow
• Sample business rules
• Sample linguistic resources (TMs, TBs, baseline MT)
• Optional/custom components and workflow steps (forms, fields, etc.)
• Production pilot
  ➢ *Test the workflow, not just the filters*
Document TMS/PEMT Production Procedures – Role-Specific Instructions

- Project Managers
  - Production
  - Offline procedures
- Linguist Users
  - Production
- Client Users
  - Portal access/request
  - Production
- Other Production Roles (as applicable)
Develop and Implement Training

*Client stakeholder participation and buy-in is key to project success.*

- Develop a reusable curriculum
- Provide a general system overview
- Provide role-specific training
Production Deployment

• Configure and deploy client portal and other auxiliary components
• Align legacy content
• Optimize TM corpora for MT training
  ➢ Segmentation
  ➢ Markup
• Perform initial training of Domain-Specific MT engines/language pairs
• Perform first automated and human evaluation of MT – start measuring
Start PEMT!!

• Start production for the selected Task Orders/Programs

• Adjust configuration, procedures, and documentation, as applicable
  ➢ Deliver the updates to the appropriate parties
Continuous MT Improvement Cycle

MT

MT Training

TM Corpora

PEMT
Additional Automated Workflow Options

**TM-MT Only**

1. Input
2. Segmentation
3. TM
4. MT
5. Output

**TM-MT with Edit**

1. Input
2. Segmentation
3. TM
4. MT
5. Edit
6. Output
Program Launch

- Kick Off
- Surge
- Maintain
- Improve & Scale
Kick Off

- **Review Statement of Work (SOW)**
  - Hold kick-off meeting to set expectations, and clarify parameters and assumptions with stakeholders

- **Inform Stakeholders – before, during, after kickoff!**
  - “Engineer for success” with source selection, MT training corpus
  - Manage expectations for productivity, timeline
  - Confirm client’s priorities, preferences, and level of involvement

- **Set Goals and Key Performance Indicators (KPIs)**
  - Linguist productivity
  - Tool effectiveness
Surge

• **Build a Team**
  ➢ Linguists, Engineers, PM

• **Train**
  ➢ PEMT objectives and workflow
  ➢ Client-specific tools and style guides
  ➢ HLT tools/resources including CAT, TMS, TM/TB, MT

• **Baseline**
  ➢ Translate sample set of material (larger = better) outside of PEMT environment to measure productivity sans HLT

• **Document / Track Everything!**
  ➢ Client communications
  ➢ Workflow adjustments
  ➢ Technology data
  ➢ Performance data
Maintain

• **Prioritize Knowledge Sharing**
  - Training materials, lessons learned, documentation
  - Meet regularly

• **Monitor, Report, Adjust**
  - Provide reports and recommendations monthly
  - Metrics

• **Evaluate Linguists’ Performance**
  - Define and share performance and productivity metrics based on collected data

• **Review Client Level of Engagement**
  - Client involved too much or too little?
  - Client requests within contract scope?
Improve & Scale

• **Monitor technology developments and provide recommendations as necessary**
  - Escalate questions/issues to software developers as needed
  - Test and troubleshoot
  - Receive PM and linguist feedback on potential implementations

• **Evaluate MT output monthly; experiment and make adjustments as needed**
  - Capture qualitative and quantitative data

• **Communicate success stories and lessons learned**
  - Continually demonstrate ROI

• **Scale with additional domains and locales**
  - Ensure HLT solution can accommodate growth and address locale-specific criteria
Recap

• Review historical challenges
• Describe big picture and take incremental steps
• Receive client buy-in
• Customize the HLT solution -- one size does not fit all
• Document/track for reusability and scalability
• Develop talent through training
• Ask for client feedback and evaluate your success
• Continue to improve
Future Enhancements

- Neural MT Non-Formal Language Support
- Post-MT Automated Editing
- Dynamic Learning NMT
- Substring tokenization
- Integrated speech-to-text supported by TMS/CAT/MT
Thank you

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