ITS 2.0 Automated Translation of Natural Language Content

MultilingualWeb Linguistic Technology
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Translating and the Computer Conference
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Linguaserve specializes in multilingual web advanced solutions for 21st Century Challenges.

Experience in interoperability since 2002
and real-time multilingual web publishing since 2008.
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Why ITS 2.0?

- ITS 2.0 is a conceptual system of elements and attributes for the internationalization, translation and localization of web content.
- ITS 2.0 is not merely a tagging or labelling standard.
- ITS 2.0 can be represented in different formats.
- ITS 2.0 success is expected to materialize in real-life implementations (currently 20).
- ITS 2.0 looks for the broad consensus across communities.
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Standards, they are great. Everyone should have their own.

- Standards are sometimes produced in excess, making them compete with one another for the same purpose.

- By contrast, new technologies and paradigm shifts that occur in all disciplines require new rules for new needs.

- In this context, the viability of the Web's multilingualism needs a certain level of metadata standards.
Time flies like an arrow

- The multilingual information and knowledge society demands the development, dissemination and adoption of new standards.

- The problem is that the speed of this society does not allow this to take as long as the 'Space Shuttle and the horse's Rear End' did.
Standards help everybody

- They help SMES to:
  - Compete better and faster.
  - Be more compatible, avoiding customer reluctance.

- And help large companies to:
  - Lead the market by leading standards.
  - Facilitate new extensions and features by using standards.

- Open source communities could certainly become open-open, i.e. open source based on open standards.

- And… of course: users.
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The W3C MultilingualWeb-LT Working Group receives funding by the European Commission (project name LT-Web) through the Seventh Framework Programme (FP7) in the area of Language Technologies. Grant Agreement No. 287815.

Linguaserve is a member of MultilingualWeb-LT because:

- Standards help us (as an SME).
- There is no magic button: human language and translation are extremely complex.
- Web content annotation greatly helps to improve results in Multilingual Web Linguistic Technology.
MultilingualWeb metadata requirements

- Information in Web content that is relevant for language technology processing.

- Processes for creating Web content via localization and a content management workflow.

- Language technology applications, tools and resources used in applications that use or support this standard.
ITS 2.0 data categories

- Translate
- Localization Note
- Terminology
- Directionality
- Language Information
- Elements Within Text
- Domain
- Text Analysis
- Locale Filter
- Provenance
- External Resource

- Target Pointer
- Id. Value
- Preserve Space
- Localization Quality Issue
- Localization Quality Rating
- MT Confidence
- Allowed Characters
- Storage Size
03. Multilingual Web LT and ITS 2.0

Formats supported by ITS 2.0

- ITS 2.0 supports XML-based formats and HTML5, and it is useful for XHTML, and CMS-based ‘deep web’, DITA, DocBook, and mapped to RDF/NIF and XLIFF.

- ITS 2.0 also introduces or modifies important mechanisms like local and global explicit selection rules.

- See http://www.w3.org/TR/its20/
ITS 2.0 implementations

- More than 20 implementations in different areas (see http://www.w3.org/International/its/wiki/Use_cases_-_high_level_summary).

- Two are presented here:
  - Interchange between Content Management System and Translation Management System
  - Content Internationalization and Advanced Machine Translation

- MultilingualWeb-LT has also laid the technical foundations for new business opportunities.
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Automated off-line translation system (Interoperability)
04. ITS 2.0 interoperability CMS/TMS

www.w3.org/International/its/wiki/ITS_Implementations

#CMS_Integration
Use case: VDMA

- VDMA: German machinery and plant manufacturers' association
- Largest industrial association in the capital goods industry in Europe (3170 industrial members)
- Highly export-oriented
Use case: Scope

- 150 press releases annotated, processed and translated
- 75,000 words annotated and processed with ITS 2.0
- Using Drupal MLW-LT modules
- ITS 2.0-aware automatic content round-tripping
- Languages: DE > FR, ZH
High level flow

WEB SITE

CMS

Webservices

TMS

Engine (Processing)

Workflow (Management)

CAT Tool / Machine Translation

GLOBALIZATION MANAGEMENT SYSTEM

PLATFORM for LOCALIZATION, INTEROPERABILITY and NORMALIZATION of TRANSLATION

www.vdma.org

VDMA

cocomore

linguaserve
Drupal – GBC Server/PLINT

04. ITS 2.0 interoperability CMS/TMS
ITS 2.0 in CMS/TMS processing
Test case statistics

- **Data categories**: Translate, Allowed Characters, Localization Note, Storage Size, and Language Information.
- **5,544 tags**: 4,700 *manually annotated tags* and the rest *automatically annotated*
- **Density**: 39.3 tags per document
- **From** German **into** French and Chinese
- **Other** two data categories were annotated: Provenance and Readiness (ITS 2.0 Extension)
- **Distribution** of data categories: Translate (with value: no) 69.3%; Allowed Characters 11.3%; Provenance 5.4%; Language information 4.3%; Localization Note 3.8%, Storage Size 2.3%; and Readiness 2.3%.
ITS 2.0 impact
Opportunities rise from needs

- Very frequently updated web sites that need efficient multilingual updates and maximum control:
  - Corporate and industry information
  - e-Government
  - e-Commerce
  - Educational web sites
- Highly distributed content creation through the CMS
- Web 2.0 and user content created
  - Applying MT systems for immediacy
- Using ITS 2.0 for multilingual SEO
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Multilingual Web Publishing System (Real-Time)
06. Conclusions
Use case: the Spanish Tax Agency

- **www.agenciatributaria.es** is the user in the “Online MT System” showcase in MLW-LT

### Spain: General Indicators 2011

- Spain is a country that is regionally structured into 17 autonomous communities and 2 autonomous cities with **5 co-official languages**
- Population: 47,190,493 inhabitants (12.2% foreign residents)

### Mission of the Spanish Tax Agency

- Effective application of Spain’s tax and custom system
- Management of tax resources on behalf of other public administrations when required by Law or Agreements

### General taxpayer census

- Individual taxpayers: 46,509,231
- Companies: 2,674,547
- Other organisations: 2,293,939
- **Total taxpayers: 51,477,717**
Use case: Scope

- Online MT System Internationalization showcase components:
  - ITS 2.0
  - HTML5
  - ATLAS RT (Linguaserve’s Real-time Multilingual Publishing System)
  - Lucy Software MT (Rule-based Machine Translation)
  - MaTrEx, from Dublin City University (Statistical Machine Translation)
  - www.agenciatributaria.es (CMS: OpenText WEM)
- RTMPS implementation and deployment in pre-production
  - ITS 2.0 data categories: 6 (Translate, Localization Note, Language Information, Domain, Provenance, Localization Quality Issue)
  - Prototypes, test suite engines, and use case
  - 250 web pages ES-EN and 30 web pages ES-FR, ES-DE
  - Content annotation and MT post-editing (EDI-TA methodology)
Online MT System I18N

Online MT Internationalisation
Online MT System I18N

www.agenciatributaria.es

Pre-Production/Pre-filters
Translate ➤ Adds constant marks to block non-translatable text nodes and attributes.
Domain ➤ Generates a HTML section per domain, and adds such information to the section sent to the MT System to select the appropriate TM and vocabulary (glossary).
Localization Note ➤ Encoding of information to convey it to the post-editor. Localization quality issue ➤ Encoding of information to convey it to the post-editor.

Content Editor + FMT:
Localization Note ➤ Blocked by the Content Editor but visible for the post-editors.
Domain ➤ Stores the revised texts in the domain specific TM.
Provenance ➤ Adds and blocks the information about the reviser.
Localization Quality Issue ➤ Adds and blocks the quality issue inserted by the reviser.

Post-production/Post-filters:
Language Information ➤ Updates the language attributes in the translated content.
Provenance ➤ Adds and blocks the information about the MT System.
05. Online MT Internationalisation

ITS2 in Online MT System I18N

- DCU MaTrEx SMT
- De-Segmenter
- Decoder (MT)
- Segmenter
- Locale Filter
- Translate
- Localization Quality Issue
- Language Information
- Localization Note
- MT Confidence
- MT Post-processing
- Post-Editing
- Provenance
- Content Post-processing
- Publication
- Content I18N
- Translation Request
- Domain
- MT Kernel
- HTML5
- HTML5 Formatter
- HTML5
- ATLAS RT HTML5
- ATLAS RT HTML5
- MT Interface
- Content Pre-processing
- Translation Request
- CMS
Shifting gears: New cost structure

[Diagram showing cost structure between Traditional project and Real-time Multilingual Publication System]

Overall costs

- Preparation/Management
- Translation
- Human Revision/Post-
- Localization
- QA & Testing

[Bar chart highlighting Translation with the highest cost]
MLW-LT Online MT Business Case

**Strengths**

- Lower translation costs (MT + PE) depending on % of post-editing (E.g. 100% post-edited: -30%)
- Management costs: higher setup / lower maintenance (-60% -80%)
- Non-invasive technology
- Real-time or fast post-edition

**Weaknesses**

- Viability depending on:
  - Language combination and MT system output

**Opportunities**

- Web sites with daily high volume updates: E-commerce, Administration, Corporate news and publications, user content generated (social media)
- In house installation for > 1 million words and frequently updated

**Threats**

- Control, performance and security:
  - The client might lose control of translation: solved with ITS 2.0

- Recent MT approaches (Hybrids, vertical sectors/users…)

- Real-time performance of MTs
- Security level in shared RTMPS
- Needs pre-editing and post-editing tools (ITS 2.0 and HTML5)
Opportunities rise from needs

- **e-Commerce**
  - Very high volume and rotation
  - Short texts and repetitive descriptions
    - Better for MT
    - Quicker to post-edit
  - Very sensitive to ITS 2.0 benefits

- **e-Government**
  - Controlled language and content policies

- **HTML from several CMS and other applications**
  (Content source independent)

- **Web 2.0 and user content created**
  - GIST translation
  - Immediacy
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ITS 2.0 benefits (I)

- **Translate**: Translatability control from data. E.g. it allows to add “non-translatable” terms to be used by several specific glossaries or MT systems.

- **Localization Note**: Direct communication between webmasters, PMs, translators, and post-editors. When alert type, it can be used for triggering certain processes in the Translation Workflow. Activation rules for MT post-editing.

- **Domain**: Automatic selection of CAT/MT terminology, dictionaries, and translation memories.

- **Language Information**: Quality checks to ensure the content’s source language or part of it.

- **Allowed Characters**: Quality check for the target content.
ITS 2.0 benefits (II)

- **Storage Size**: Quality check for both original content and target content. Can also be used for translators’ visual control.
- **Provenance**: Identification of agents, possibility to reassign the same translator/reviewer in new versions, and inform the Project Manager. Tracking control in the CMS.
- **Localization Quality Issue**: Quality aspects reported to translation consumer or post-editor.
- **MT Confidence**: Post-editors judge quality of translation.
- **Readiness (ITS 2.0 extension)**: Control of processes to be done, date control for availability, delivery and priority.
06. Conclusions

Win-win business

- More efficient control over the content and faster fine-grain communication between localization chain actors (e.g. webmaster/project manager).
- Localization platforms and format independent.
- Better web and linguistic technology machine/machine interaction.
- Better web and localization human/machine interaction.
- Increasing fully automatic processes and localization expert systems in CMS and TMS.
- Opens up ways for connectors, pre- and post-editing, CAT tools, SEO…
- Time reduction by increasing the efficiency of the process.
- Cost savings in management and translation.
Thank you!

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