

Digital Critical Editions of Slovenian Literature: an Application of Collaborative Work Using Open Standards

Tomaž Erjavec¹, Matija Ogrin²

¹ Department of Knowledge Technologies,
Jožef Stefan Institute
Jamova 39, Ljubljana, SI-1000, Slovenia
tomaz.erjavec@ijs.si

² Institute of Slovenian Literature and Literary Sciences,
Scientific Research Centre of the Slovenian Academy of Sciences and Arts
Novi trg 2, SI-1000 Ljubljana, Slovenia
matija.ogrin@zrc-sazu.si

Abstract

The paper outlines the methodology used to present Slovenian literary texts and documents in critical e-editions. The encoding and linking of the several forms of the text in one single edition was subject to strict editorial standards. The result is that every part of the text can be seen in juxtaposition of three different perspectives: facsimile, diplomatic transcription and critical transcription. The preparation of these complex electronic editions involves up-translating the source materials into a canonical, standardized edition employing XML and the Text Encoding Initiative Guidelines, and down-translating this storage format into the HTML Web presentation. This workflow depends on the use of open standards and intense collaboration between the content and technology providers. We also present the e-editions currently available on the Web and discuss further work planned in the project, esp. the introduction of language technology into the publication process.

1 Introduction

Historical, religious, literary, and many other texts are the medium of our cultural memory – such texts constitute the memory and the very identity of our communities. And the more rich and complex are the materials, composed in critical editions of such text, the more broad and lively picture of historical time and space the editions unveil to us; the more complex are the edition's materials, the more complex is the cultural memory, mediated by the edition.

The editions, based on the principles of textual criticism and editorial technique, comprising digital facsimile, transcriptions, translation, apparatus etc., reveal a textual-semantic structure of maximal complexity. The immense capacities of the digital medium for structuring, analysis and presentation of texts can be used to the greatest extent and fully exploited only by use of text-critical principles. To apply these traditional principles to digital editions of selected Slovenian literary texts – that is the main purpose of the collaborative project “Scholarly digital editions of Slovenian literature”. This paper aims to outline the project's methodology, focusing on the structuring of materials and their conversion into a canonical electronic form in such a way that their structure not only is preserved but also semantically enriched, which enables further modes of analysis and presentation.

2 Methodology

Our project has an organization by no means rare in humanities computing: one partner has expertise in the science of textual criticism, which had been, however, done mostly in a classical manner with the computer used only as a word-processor, while the other partner's expertise lies in human language technologies, in particular in the compilation of annotated textual corpora. As one partner was predominantly involved in producing the content and validating the result, and the other in implementing the formal structure and converting into and out of it, it was imperative to enable a seamless platform in which to effect the development of each digital edition.

The methodology employed in the production process is illustrated in Figure 1, and centers on the canonical, standardized edition of each material, which is stored in XML, according to a parameterization of the Text Encoding Initiative Guidelines (Sperberg-McQueen & Burnard, 2002), a specification primarily meant for scholarly encoding of texts. The preparation of the materials then revolves around the up-conversion of the original digital document into TEI/XML, and the down-conversion of this storage format into the HTML Web presentation. In this section we detail these aspects of the technology used in preparing and presenting the materials.

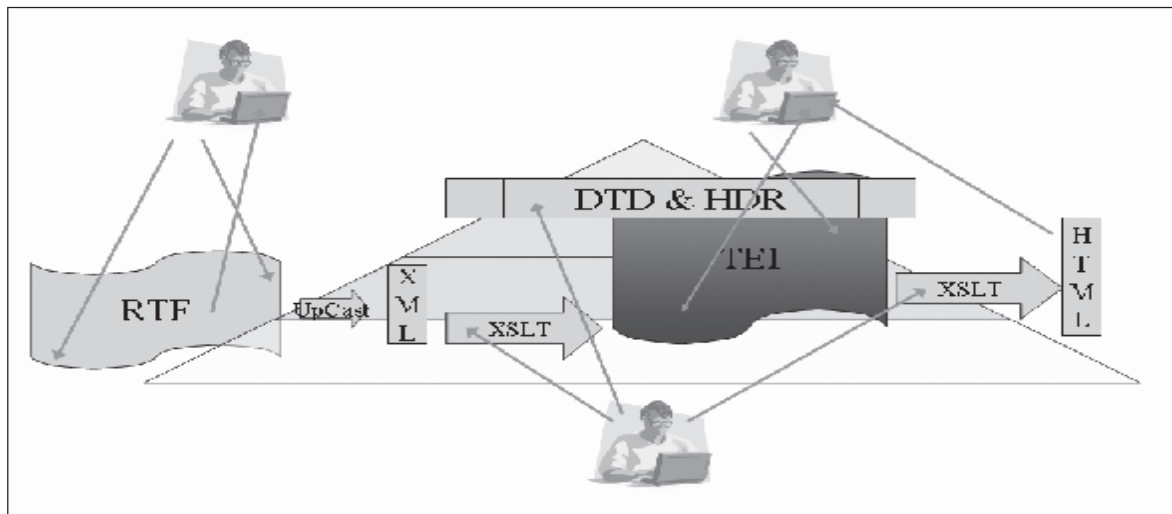


Figure 1: The workflow in the preparation of the materials; the horizontal axis represent time/effort needed to produce a particular resource, while the vertical axis represents the useful information of a resource.

2.1 The XML Document Type Definition

An XML schema defines the element vocabulary for a particular type of documents and the allowed interrelationships between these elements. It is a vital part of using XML, esp. in the production stage, as it gives the semantics of elements used, and enables formal validation of the produced marked-up documents. While it is, of course, possible to develop an idiosyncratic schema that covers exactly the needs of a particular edition or project, this is a non-trivial process, esp. with materials as complex as are text-critical editions. It is thus much easier – as well as leading to better results – to employ a standard schema for a particular document type, as long as one is available.

The Text Encoding Initiative Guidelines (Sperberg-McQueen & Burnard, 2002) are specification primarily meant for scholarly encoding of texts. The TEI is an open de-facto standard, with a substantive history and large user community. It covers a wide variety of text and annotation types, and also defines a header, which allows the inclusion of detailed metadata. Finally, it allows for project specific extension and modification mechanisms.

Given its generality, the TEI does not define one single schema to cover all types of materials and types of annotation. Rather, the current version (TEI P4) offers a number of modules, which can be combined (and further extended) to arrive at a particular schema realized as an XML Document Type Definition (DTD). For our project we chose the following modules:

- TEI.prose, the base module for encoding prose – it contains elements for the TEI header, giving detailed meta-data on the document (such as file, source, encoding and revision descriptions), as well as standard elements for document structuring (division, paragraph, table, note, ...) and sub-paragraph annotation (emphasis, highlight, ...);
- TEI.transcr, an additional module for the transcription of primary sources, in particular manuscripts, which includes elements for correction and emendation, recording the different hands in the text, etc.
- TEI.linking, an additional module that enables intra- and inter-document linking and contains elements and attributes to tie together the different transcriptions of the material and link the material with external resources;
- TEI.figures, an additional module to encode figures and other graphical material, used for encoding the facsimile, i.e. links to the graphic files containing the facsimile in various sizes and resolutions;
- TEI.extensions, a user specified module, that implements user extensions to the standard TEI – we used it to define some extra elements and to enumerate the attribute values for e.g. placement information on notes.

However, even after the TEI is parameterized for a certain project (i.e. we choose the required modules and extensions, arriving at an XML DTD), there is still considerable leeway in the choice of particular elements to use. Such a TEI DTD will contain, at least in the current version P4, also a large number of elements and attributes not required for the material. Such an over permissive DTD can, in the main, be useful for validation

and interchange, but does, however, have a negative impact on authoring, making it difficult to use a DTD-aware menu-driven XML editor on the materials. This is why we – after defining the TEI parameterization – also produced a strict (minimal) DTD, which specialises the TEI one. This DTD was used in the developmental cycle – in the final, public version of the materials we then revert to the “official”, TEI compliant DTD.

```
<div id="sl1d" corresp="sl1k" n="1" type="dipl">
<head>Diplomatični prepis</head>
<page id="sl1d-f.1" corresp="sl1f.1" n="1">
<line id="sl1d.1" corresp="sl1k.1" n="1" rend="right">1825. XIII</line>
<line id="sl1d.2" corresp="sl1k.2" n="2" rend="center">Na 16 nedelo po Binkufhtih.</line>
<line id="sl1d.3" corresp="sl1k.3" n="3" rend="center">K'kerfhanfkimu govorjenju</line>
<line id="sl1d.4" corresp="sl1k.4" n="4" rend="center">nagovor.</line>
<line id="sl1d.5" corresp="sl1k.5" n="5">Takrat bode tebi zheft, kader tijifti, kateri je tebe
po&#301F;</line>
<line id="sl1d.6" corresp="sl1k.6" n="6">vabil, tebi porezhe: Prijatel, pomekni fe gori.
<note place="right">Luk. 14.</note></line>
<line id="sl1d.7" corresp="sl1k.7" n="7" rend="center">Vvod.</line>
<line id="sl1d.8" corresp="sl1k.8" n="8"><note place="left">1.</note> Tolko ftánov je na le temu
zhañnimu fvetu, pa <emph>vfih</emph> le</line>
<line id="sl1d.9" corresp="sl1k.9" n="9">eden pokliz: dofezhi nebeshko kraleftvo.</line>
<line id="sl1d.10" corresp="sl1k.10" n="10">Od fvetliga zefarja na fedeshu flatim do
<del hand="AMS">berazha</del> froma&#301F;</line>
<line id="sl1d.11" corresp="sl1k.11" n="11">ka per palzi berafhki je vfaki ftan Bog is'volil</line>
...
```

Figure 2: A facsimile transcription in the canonical TEI / XML format – compare with Figure 3.

2.2 Preparation of the materials

First, the exhaustive text-critical analysis and transcription(s) of text are prepared in a text-editor. As the majority of early Slovenian texts exist in one version (witness) only, the editions generally don't aim to collate versions but to present and explain the autograph itself in its original historical grammar, lexis and orthography. To achieve this basic aim, clear editorial standards are needed. With these standards in force, it is possible to prepare consistent diplomatic transcription (which preserves the historical specificity of the original), the critical transcription (where the text is edited against some explicit formal rules) and to write the explanatory apparatus. At this stage we must decide which features of the text should be marked-up, i.e. which “intelligence must be embedded in the text in such a way that the program can derive information from it”. (Hockey, 2000, p. 24)

Once the analysis and preparation of text is over and the transcriptions, emendations, notes etc. are written in a text-editor, usually Word, the material is transformed into the canonical format. For the up-conversion the data are first converted into a "sane" format, e.g. from Word into XML via any of a number of RTF to XML converters, such as OpenOffice or UpCast. Next, for each edition, dedicated transforms were written, which take the presentation-oriented source XML and convert it in a pipeline into the target TEI encoding. These filters were written mainly in XSLT, the XML transformation language, also a recommendation of W3C and hence a standardized specification which is supported by various tools, e.g. IE Explorer. However, while XSLT is ideal for encoding XML structure conversions, it is less suitable for cases where certain string patterns should give rise to XML structures. For such cases filters were written in the Perl programming language. Finally, an XSLT stylesheet is written for each material that enables basic viewing of the XML format.

The production of the final version of an edition takes the form of a cyclical process. The first version of the materials and transformation scripts is produced, and the resulting TEI/XML materials converted to HTML, and the result evaluated. The errors discovered can be one of three types: (1) mistakes in the original file (2) mistakes in the conversion procedure or (3) mistakes in encoding practices. For (1) the original file is corrected, for (2) the transform scenario and for (3) the (semantics of the) XML schema that specifies the element vocabulary used. After correcting the observed mistakes, the up-conversion is re-run on the original file and the cycle repeated. This kind of rapid prototyping approach encourages collaboration and the interchange of expertise.

When the material for a particular edition reaches the stage where the content and annotations reach the limit of what is still possible (and feasible) to correct in the (Word) original, the digital original is discarded, and only the canonical TEI version retained. Any subsequent revisions then proceed directly on the canonical

version, using an XML editor. This, of course, means that from this point on the person editing the materials must be familiar with the concepts behind XML and with the TEI encoding scheme. This stage also involves writing the meta-data of the edition, i.e. a description of the material, its sources, and the encoding practices used – these are all contained in the TEI header.

In Figure 2 we see an example of some material encoded according to our DTD. As can be seen, the elements are heavily indexed, with each division, page and line having its ID as well as the reference to the corresponding ID from another transcription.

2.3 Presenting the materials

With the canonical, storage format of the materials in place, there remains the question of how best to utilize them. We are, at this stage, not overly concerned with printed versions, but rather aim to offer the materials on the Web, and, possibly, on CD-ROM.

We currently support one HTML view per book, which is produced off-line with an XSLT stylesheet. As can be seen in Figure 2, the HTML itself is reasonably sophisticated – it tries to follow the original as close as possible (structure, placement, emphasis, corrections, emendations), and also provides parallel views of the various transcriptions as well “digital extras”, e.g. links to the exact passage of the Bible that is being referred to in the text. We also made efforts for our presentation to conform to relevant accessibility standards (Wymer, 2005).

The down-conversion into HTML is also realized in XSLT, for each material separately, although here the various scripts share substantial portions of their code. In addition to graphically realizing various elements of the TEI source (such as changing TEI `` elements into HTML `<s>`, i.e. strikethrough), the down-conversion also generates the table of contents, and, crucially, produces a side-by-side view of the facsimile and text, as well as parallel views of the different transcriptions.

An important point for the scholar who wishes to know more about the (digital) edition is also the HTML rendering of its TEI header. This XSLT template expands the header tags into their localized string descriptions (e.g. `<respStmt>` to "Responsibility statement" or "Izjava o odgovornosti") and furthermore links each tag to its definition in the TEI Guidelines (the complete TEI Guidelines are also mirrored with each book). As the TEI header also contains a list of the tags used in the body of the document, this means that all elements used in the material have directly available documentation.

The current scenario of “one book, one HTML” has the advantage of being suitable for on-line (Web) and off-line (download or CD-ROM) publication, without the need for any special software, save an HTML browser. However, it does not enable the adaptation of the presentation to different needs and user profiles, or take advantage of all the other possibilities offered by the XML annotations. This remains as further work, but it should be noted that software is beginning to be made available that is specifically tailored to enable complex views of TEI encoded text-critical editions (Schreibman et al., 2003) – so it makes, at this stage, more sense to concentrate on the content rather than on the mode of presentation.

2.4 Character encoding

A special issue is the complex (historical, phonetic) characters needed for the presentation of the materials. Many such characters are in fact supported by Unicode, but not all. In the edition of the 10th century “Freising manuscripts”, we use the Private Use Area of Unicode, and a special publicly available ZRCola character set and font (Weiss, 2004).

3 Current Results

The main result of our endeavours is the Web library of critical editions of Slovenian literature at <http://nl.ijs.si/e-zrc/>. It currently contains its first three critical e-editions, in particular the Three Sermons on Language by Anton Martin Slomšek (1800–1862), including facsimile, diplomatic and critical transcriptions and notes (Erjavec et al., 2005); a part of Sigismund Zois’ (1747–1819) correspondence, including facsimile, the diplomatic transcription, and translation into Slovenian (the correspondence is in German), as well as notes and a hyperlinked glossary of person names appearing in the letters; and a collection of poems by Alojz Gradnik (1882–1967), which contain transcriptions of 15 different variants (various printings as well as author’s corrections) of the collection. Currently we are working on a number of other editions, where the most important (and complex) one is the “Freising Manuscripts” (972–1039), three religious texts, which are the oldest written Slovenian texts and the oldest Slavic texts written with Latin alphabet. Due to their importance, the critical edition encompasses an enormous apparatus: it includes facsimile, diplomatic, critical and phonetic transcriptions; translations into Latin, Old Church Slavonic and five modern European languages; and a

dictionary covering the critical transcription, where each entity of dictionary contains the phonetic representation, grammatical information, translations, concordances from the critical transcription, and more. Additionally, the printed edition contains introductions, notes, and a bibliography.

A distinguishing feature of our library is the free availability of the materials (apart from the Gradnik poems, where this is not possible due to copyright restrictions) – not only are the editions available to everybody for browsing in their HTML form, but also for downloading as the TEI/XML source, with the accompanying facsimile graphical files. Such free access is possible as the original texts are usually over a hundred years old, while the authors and editors of the transcriptions and markup have agreed to make them freely available.

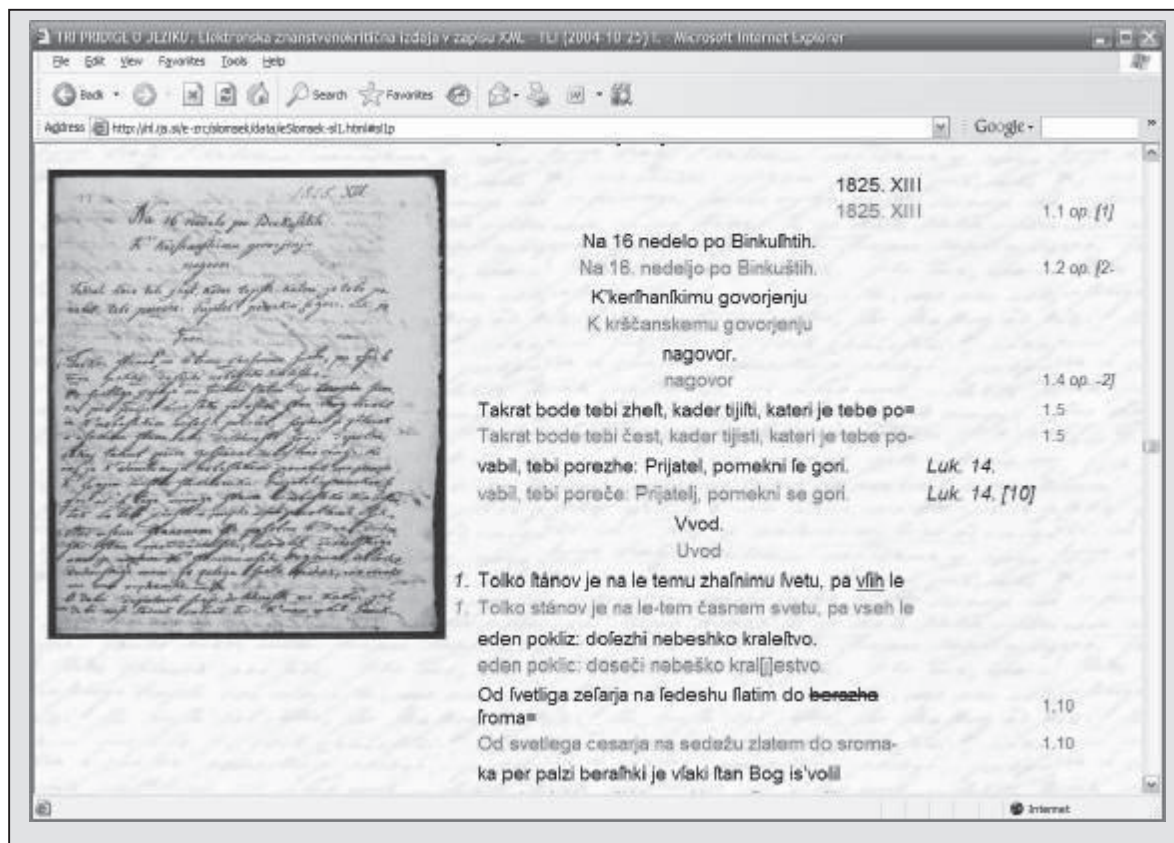


Figure 3: Example of the presentation HTML format

4 Conclusions

The communicative power of old texts and historical documents can be brought to their full expression in a synergism of their visual, full-textual and audio presentations. This goal, which is of considerable importance for such spheres as education, museology, archives, human studies etc., can be achieved by digitization and encoding of materials, strictly applying open encoding standards and making the resulting materials available on the Web. The paper presented the methodology and technology to achieve this aim by: 1) up-conversion to TEI/XML/Unicode via a collaborative and cyclic process of step-wise refinement, largely implemented by means of XSLT transforms, 2) down conversion into a user-friendly HTML mounted on a publicly accessible URL. This methodology has been tested on three completed e-editions, while several others are currently in the process of production.

The most obvious advantage of our e-editions is the parallel presentation of the various transcriptions, which juxtaposes the original text with its more understandable forms. As mentioned, further work includes the addition of audio streams, where we plan to use the SMIL standard (W3C SMIL, 2005), as well as the addition of video for performance oriented materials, such as the baroque-era Passion Play from Škofja Loka.

Another direction we would like to pursue in our further work is the addition of mark-up for linguistic structure to our texts (Erjavec 2002, Erjavec & Džeroski, 2004). This would enable the inclusion of the texts into a web-based concordancing engine (as already implemented at <http://nl2.ijs.si/>), as well as the extraction of

parallel lexica from the transcriptions. All these analytical tools would contribute to expose the inner complexity, research potentials, and historical value of the texts published in our digital editions.

Great capability of digital editions for markup, structuring, linking, alignment, parallel comparing, annotation, emendation, analysis, interchange and visual presentation of texts can be fully exploited only in case of fully structured, complex texts — and critical editions are exactly such a kind of text. “Indeed, of the many kinds of print objects produced over the last centuries, it is difficult to think of any genre that is so well adapted to the computer as the scholarly edition.” (Robinson 2005, § 12) From this point of view, besides technological standards for an e-edition, the need and purpose of editorial standards can be seen clearly as well. In the case of our editions, it was important to draw a sharp distinction between the diplomatic and the critical transcriptions and to align them in line-per-line parallel presentation by means of XSLT transformations.

References

- Erjavec, T. (2002). The IJS-ELAN Slovene-English Parallel Corpus. *International Journal of Corpus Linguistic*, 7(1), 1-20.
- Erjavec, T., Džeroski, S. (2004). Machine Learning of Morphosyntactic Structure: Lemmatising Unknown Slovene Words. *Applied Artificial Intelligence*, 18(1), 17-40.
- Erjavec, T., Ogrin, M., Faganel, J. (2005). E-Slomšek: A TEI Encoding of a Critical Edition of 19th Century Slovenian Rhetoric Prose. *Review of the National Center for Digitization*, 6(4), 31–41.
- Hockey, S. (2000). *Electronic Texts in the Humanities. Principles and Practice*. Oxford University Press.
- Schreibman, S., Kumar, A., McDonald, J. (2003). The Versioning Machine. *Literary and Linguistic Computing*, 18(1), 101-107. <http://mith2.umd.edu/products/ver-mach/>
- Robinson, P. (2005). Current issues in making digital editions of medieval texts—or, do electronic scholarly editions have a future? *Digital Medievalist*, 1(1), 2005. <http://www.digitalmedievalist.org/>
- Sperberg-McQueen, C. M., Burnard, L. (eds.) (2002). *Text Encoding Initiative: Guidelines for Electronic Text Encoding and Interchange TEI P4, the XML-compatible edition*. TEI Consortium. <http://www.tei-c.org/P4X/>
- W3C. The Synchronized Multimedia Integration Language (SMIL), <http://www.w3.org/AudioVideo/> Visited 2005-04-20.
- Weiss, P. (2004). Vnašalni sistem ZRCola. (The text input system ZRCola). In *Language Technologies: Proceedings B of the 7th Intl. Conf Information Society, IS 2004*. Ljubljana: Jožef Stefan Institute, p.124. <http://zrcola.zrc-sazu.si/>
- Wymer, K. (2005). Why Universal Accessibility Should Matter to the Digital Medievalist. *Digital Medievalist*, 1(1), 2005. <http://www.digitalmedievalist.org/>