

XML SCHEMA OF ENTRY FORM FOR STUDENTS¹

Miodrag Mirković² and Dušan Surla³

Abstract. The work of student service is based on several documents. One of these documents is ŠV-20 form. In this paper, it is described by an XML schema. The description is done according to the structure of the document and the observed concepts. The titles of the elements reflect the concepts, whilst the attributes reflect the characteristics of the concepts that they refer to.

AMS Mathematics Subject Classification (2000): 68U35

Key words and phrases: XML schema, student enrolment form

1. Introduction

By surveying accessible papers we have come to the conclusion that there are many papers in which XML technologies are applied. They are especially used in the areas in which exchange of structured documents is needed. At the University of Novi Sad, XML technologies are being applied within the development of the library software system BISIS ([1], [2] and [3]), as well as the informational system of the student service at the Faculty of Sciences.

Within the development of student service information system, the documents of student service: syllabuses, register and matriculation book, are analyzed and modulated in XML Schema language. The suggestions of XML Schema for these documents are given in papers [4,5,6]. In this paper, the suggestion for the model of entry form for student enrolment, which is also in XML Schema language, is presented. This schema can be used as the base for the projection of the application for update and processing of entry form as independent part of the student service information system, as well as for defining the structure of the document that will be used for the data exchange with Statistical Office of the Republic of Serbia and the other independent systems of student service. The suggested solution can be used as the base for defining and adopting of electronic entry form for student's enrolment.

¹This paper is a part of the research project "Abstract models and applications in computer science", supported by the Ministry of Science and Environmental Protection of the Republic of Serbia (Project No. 144017)

²M&I Systems, Co., Ćirila i Metodija 13A, Novi Sad 21000, Serbia, e-mail: misa@mi-system.co.yu

³Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Trg D. Obradovica 4, Novi Sad 21000, Serbia, e-mail: surla@uns.ns.ac.yu

2. XML shema of ŠV-20 form

The content and the appearance of ŠV-20 is prescribed by the law. It is filled in by students when they enrol the faculty and when they enrol the school year (in 2 copies), as well as when they enrol the even number semester (1 copy).

Three wholes have been observed by the analysis of the structure of ŠV form, and they are: Heading, Filled in by statistics, and Filled in by student. Student responds to questions by filling in the requested data or by choosing one of the possible answers. Corresponding codes are joined to some answers. Those codes are filled in by statistics after the student had answered the questions.

An XML schema of the form is written in XML Schema language [7-11]. The modeling of the schema is done in XMLSpy editor [12], by using Schema Design view for graphical modeling of the schema. The graphical elements are used in this paper due to the good layout and clarity of the segments of XML schema.

The modeling itself was done in accordance to the structure of the document and the observed concepts. The names of the elements reflect these concepts, while the attributes reflect the characteristics of the concept they refer to.

The titles of the elements respond to the text of the questionnaire that they represent. Low dash is used instead of blank spaces, because the names of XML tags cannot contain blank spaces. As the goal of forming this schema is to include all the information based on which it is possible to generate the original outlook of the printed form, for all schema elements the attribute *title*, which is of fixed content and contains the accurate text of the questionnaire, is introduced. The elements by which the questions that are answered by choosing one of the possible answers with joined ordinal numbers are represented have the optional attribute *numerical_value*. The optional attribute *numerical_value* contains the ordinal number of the selected answer to the question that is represented by the element. If the code is joined to the answer, the element by which the question is represented has the optional attribute *code* that contains the code joined to the answer to that question. The notes referring to the question are shown by the attribute *notes*.

Every element of the sequence by which the part that is filled in by the student is represented not only by the attribute *title* that is previously explained, but also by the attribute *ordinal_number*. If an element represents the group of questions, it is consisted of the sequence of the elements, and, if they are numerated as well, they also have the attribute *ordinal_number* of the fixed content.

If the question is optional, the element by which that question is represented is also optional and contains the attribute of the fixed content *condition_of_filling_in*, by which the condition which must be fulfilled in order to answer the question is represented.

Root element of the schema. According to the observed structure of the ŠV form that is consisted of three wholes, the root element of the schema is consisted of the sequence of three elements, which are: *Heading*,

Filled_in_by_statistics, and *Filled_in_by_student* (Figure 1).

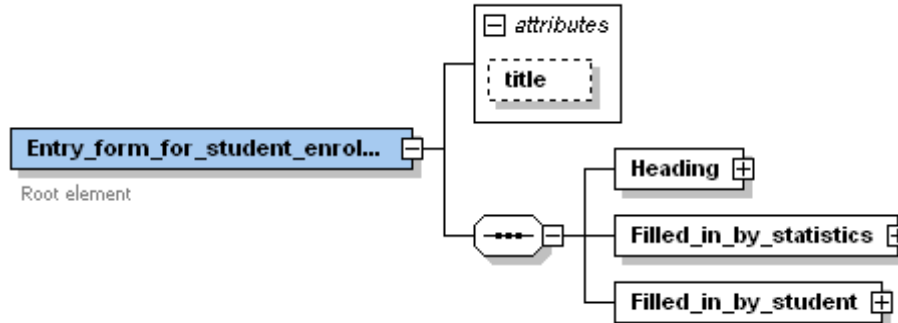


Figure 1: The root element of the form

Element Heading. This element consists of a sequence of the elements *Picture*, *School_year*, *Student_file_number*, by which are represented: place for student's photograph, questions about the school year or semester that student is enrolling, and, respectively, student file number (Figure 2).

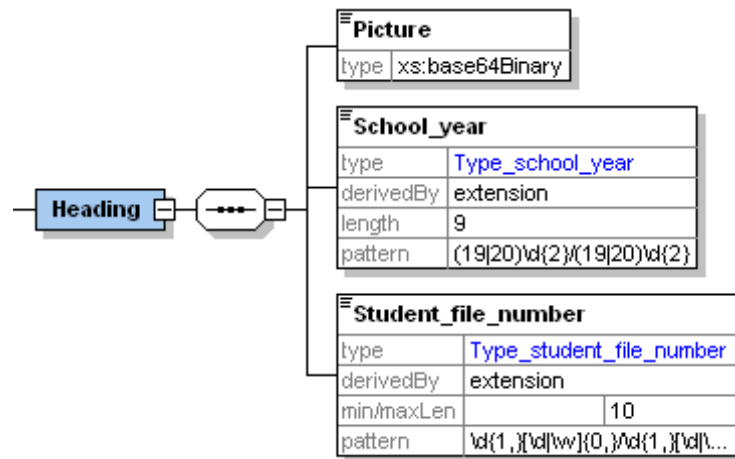


Figure 2: Form heading

Element Filled_in_by_statistics. The part that is filled in by the statistics is modulated by this element (Figure 3). It is given by the sequence of the elements *ŠV200_*, *File_register_number* and *Ordinal_number_of_entry_form* in which these questions are presented in this order: school year enrolled by student or school year in which even number of semesters is verified, file register number and ordinal number of the entry form.

Element Filled_in_by_Student. It consists of a sequence of the elements

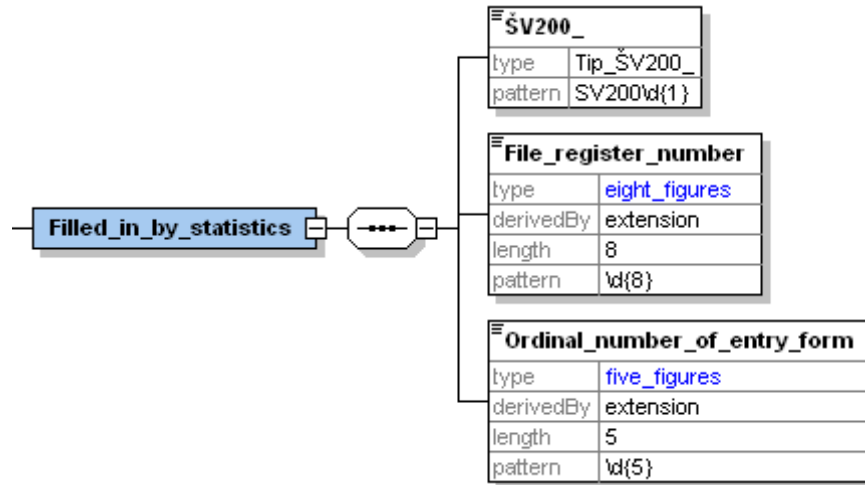


Figure 3: The form part that is filled in by statistics

by which the questions on which the student should answer are grouped (figure 4). Some of these elements, also represent grouped questions, as shown in Figures 5-10. The element *Occupation* (Figure 10) consists of the choice of two elements, because student needs to answer only one out of two questions that are represented by the elements inside the indicators of the choice order.

In the given figures is shown an XML schema of the form that embraces the structure and all the data from the form. The XML schema in electronic form can be obtained from the authors of this paper.

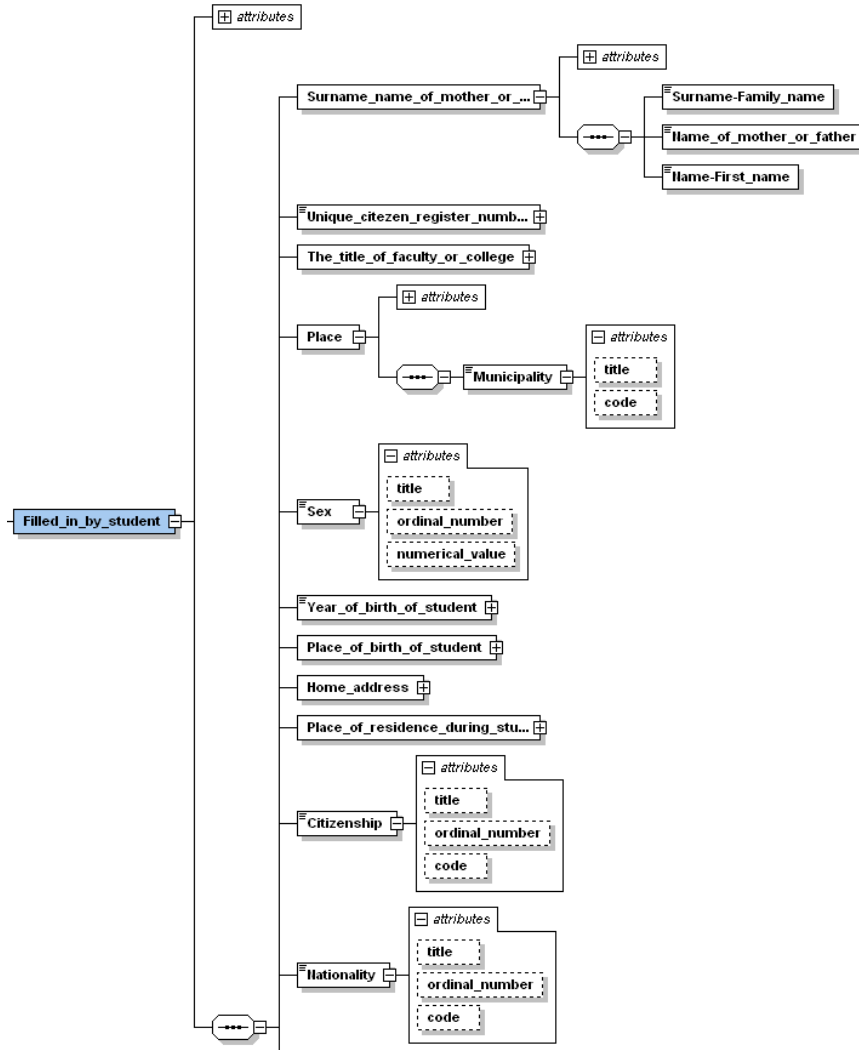


Figure 4: The form part that is filled in by student

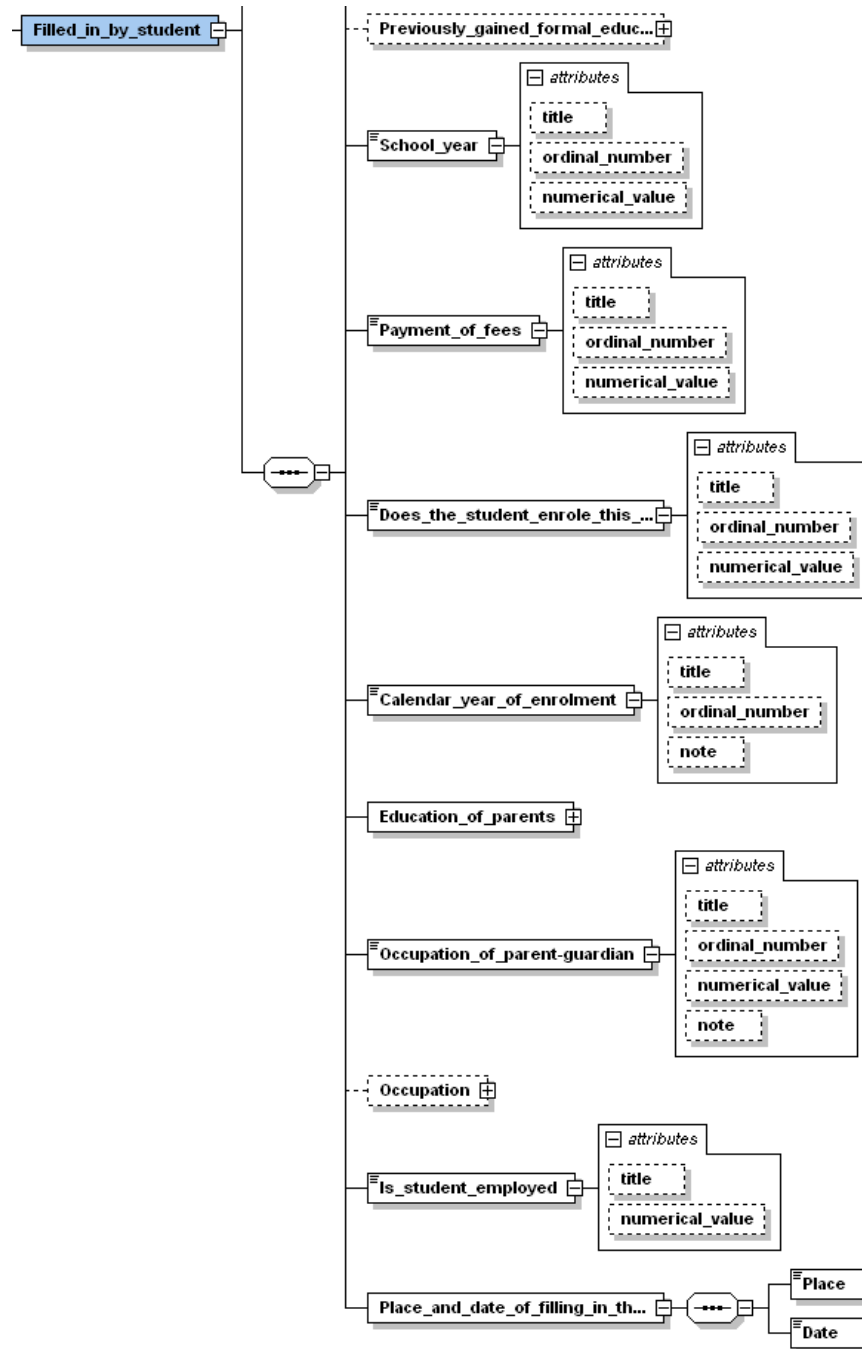


Figure 4: The form part that is filled in by student (continuation)

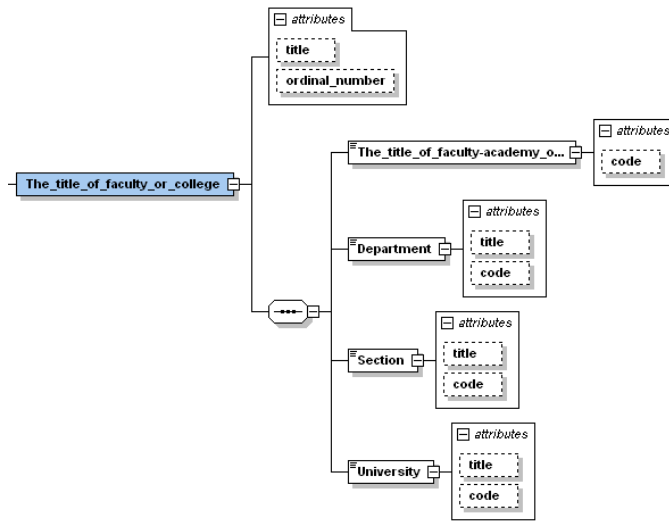


Figure 5: The title of faculty or college

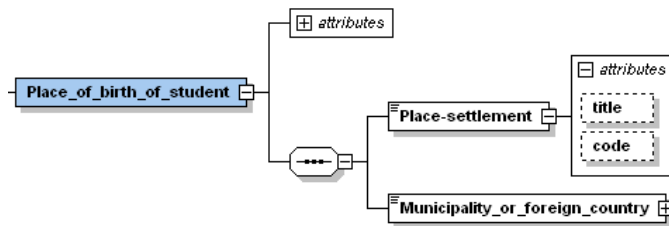


Figure 6: Place of birth of the student

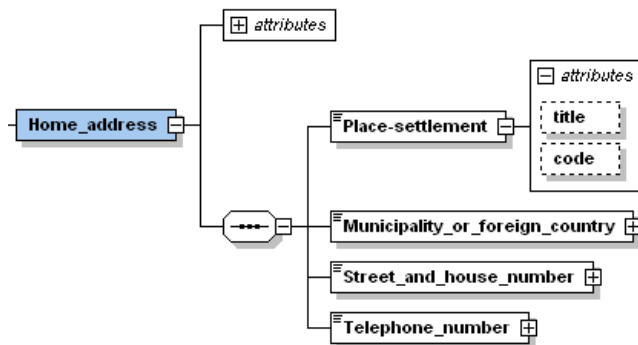


Figure 7: Home address

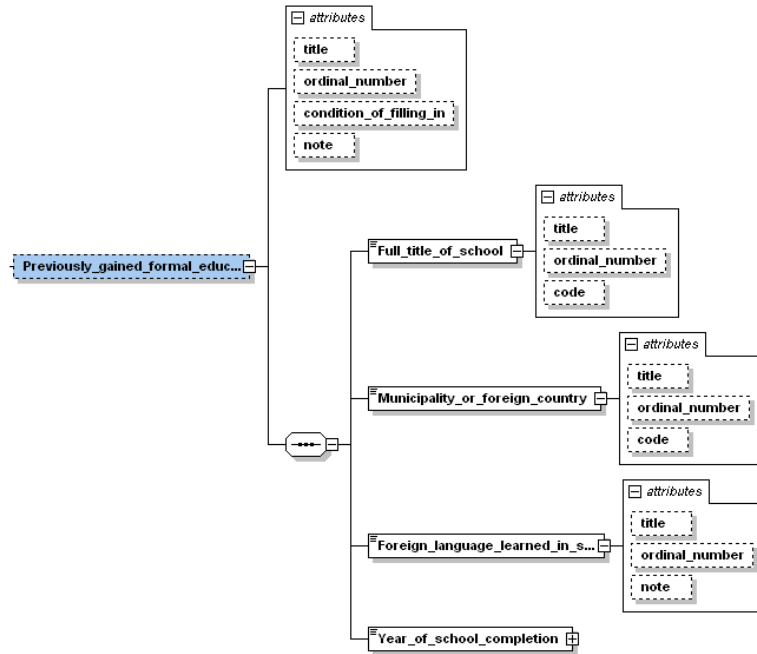


Figure 8: Previously gained formal education

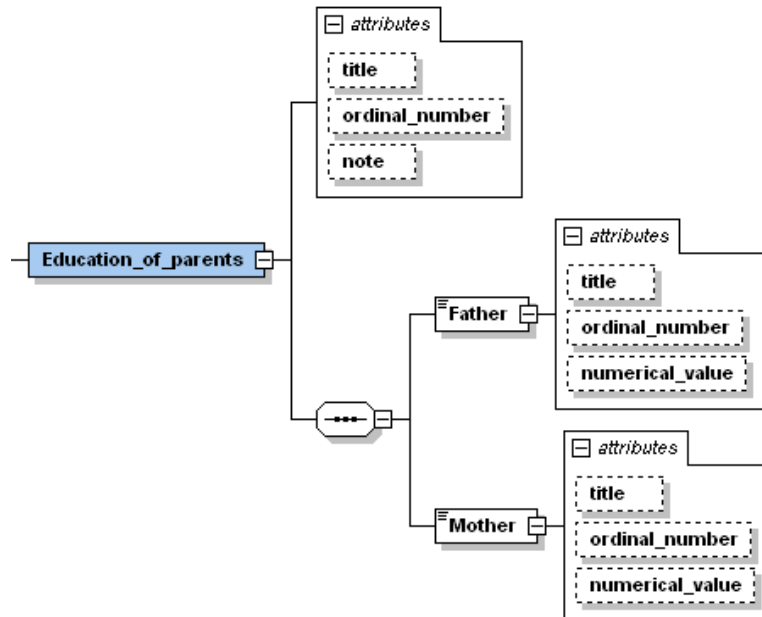
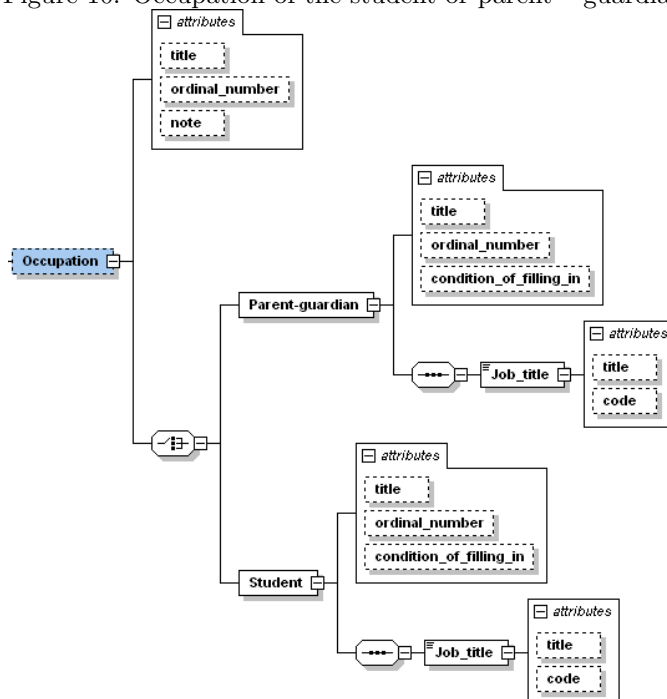


Figure 9: Education of parents

Figure 10: Occupation of the student or parent – guardian



3. Conclusion

At the Faculty of Sciences in Novi Sad, the development of a student service information system based on the XML documents is in progress. One of the documents is the ŠV-20 form. In this paper, the suggestion of a XML schema of this form is presented. This schema is formed so that all the information that is on the form is included by the schema. Based on this schema, it is possible to generate exactly the same outlook of the original printed form. The suggested schema was used for the implementation of student service for the work with XML document of the ŠV-20 form subsystem. The architecture of this subsystem can be formed so that it can be used within different information systems of student service, as well as for electronic exchange of XML documents of the ŠV-20 form and statistical processing of these documents.

References

- [1] Jaksić, M., Modelling of Bibliographical Standards in XML technology. Software: Practice and Experience, 34, 2004, pp. 1051-1064. (in Serbian)
- [2] Budimir, G., Surla, D., Quality control system of XML bibliographic records. Novi Sad J. Math., Vol. 34 No. 1 (2004) 107-130. (in Serbian)

- [3] Vidaković J., Racković, M., Modelling of Bibliographical Standards in XML technology. *Software: Practice and Experience* 36 (2006) 513-524. (in Serbian)
- [4] Nenadić, K., Mapping faculty curriculum into XML schema. *Novi Sad J. Math.*, Vol. 34, No. 1 (2004) 157-170. (in Serbian)
- [5] Sumić, D., Archiving XML Documents for the University Student Service. Master's thesis, Faculty of Science and Mathematics, Novi Sad 2006. (in Serbian)
- [6] Čuk, D., Software system for student's master archive book management. expected Master's thesis, Faculty of Science and Mathematics, Novi Sad, 2006.
- [7] Costello, R., XML Schema Tutorial. 2003, <http://www.xfront.com/xml-schema.html>, [March 22, 2006]
- [8] Extensible Markup Language (XML) 1.1, W3C Recommendation 04 February 2004, edited in place 15 April 2004, <http://www.w3.org/TR/xml11>, [March 4, 2006]
- [9] XML Schema Part 0: Primer Second Edition, W3C Recommendation 28 October 2004, <http://www.w3.org/TR/xmlschema-0/>, [January 30, 2006]
- [10] XML Schema Part 1: Structures Second Edition, W3C Recommendation 28 October 2004, <http://www.w3.org/TR/xmlschema-1/>, [January 30, 2006]
- [11] XML Schema Part 2: Datatypes Second Edition, W3C Recommendation 28 October 2004, <http://www.w3.org/TR/xmlschema-2/>, [January 30, 2006]
- [12] XMLSpy, Altova, <http://www.xmlspy.com>

Received by the editors August 25, 2006