

**PROFESSIONAL COOPERATION BETWEEN MONTENEGRO AND ITALY
ON THE IMPLEMENTATION OF ITALIAN SOFTWARE
IN THE PROCESSING OF THE ARCHIVAL MATERIAL
FROM THE KOTOR HISTORICAL ARCHIVES**

Snežana Pejović

Montenegro State Archives - Kotor Historical Archives
snezana.pejovic@dacg.gov.me

1. Introduction

In the Kotor Historical Archives, held in the Department of the State Archives of Montenegro¹, the digitisation project of a very significant archival fond – ‘Records of the Extraordinary Governors for Kotor and Albania during the Venetian Government’ – was undertaken. The project was financially supported by the Veneto Region from funds assigned for the preservation and presentation of cultural heritage created during the Venetian rule in Istria and Dalmatia². Two NGOs from Montenegro, i.e. Kotor, applied competitively to the Veneto Region to obtain financing for the projects in 2010, and again for the project itself in 2011. They are: 1. the Centre for the Preservation and Presentation of Kotor’s Documentary Heritage Notar – Kotor³, and 2. the Community of Italians of Montenegro – Kotor⁴. The project leader is the organisation Notar.

According to the originally calculated activities comprising the Project, the scanning and processing of the 40 volumes of this archival fond will be undertaken using the

¹ See more: www.dacg.me.

² Announcement of the Regional Manager of the International Relations, Cooperation, Human Rights and Equal Opportunity Department, Regional Law No 15 from 1994, ‘Interventi per il recupero, la conservazione e la valorizzazione del patrimonio culturale di origine veneta nell’Istria e nella Dalmazia’ in the framework of its Regional Programme for the years 2010 and 2011 (www.regione.veneto.it).

³ The Centre for the Preservation and Presentation of Kotor’s Documentary Heritage - Notar-Kotor is a non-governmental organisation, founded in December 1999. Within the guidelines of the programme, the organisation deals professionally with written sources and early printed material deposited within cultural institutions of the state, church and private archives and libraries, following suitable appraisal by expert and scientific authorities in Montenegro and abroad. The Centre acts to encourage the interest of international professional and scientific units for this kind of heritage in Kotor, which has been on the UNESCO List of World Cultural Heritage since 1979 (www.cdknotar.org).

⁴ See more: www.comunitaitaliana.me.

appropriate software. The corpus has 228 archival units (documents in bundles of various sizes). However, due to the reduction of the project's budget and delays in payment by the donor (the Veneto Region)⁵, Notar had to cut the volume of documents in the project proportionally to the finally received sum, which particularly concerned those documents intended for scanning and processing so as to be published on the web. In the first and the second phase of the project, finances permitted only 21 folders to be processed. So, for now, of this archival set there are presented with a description on the web portal these 21 archival folders and with them are 28,870 digital images of original documents (available in high resolution). The two NGOs are still trying to find financial support for the digitisation of all the remaining documents.

2. On the content and significance of the archival fond 'Records of the Extraordinary Governors of the Venetian Republic'

The full title of this archival fond is 'Administrative and political records of the Extraordinary Governors of the Venetian Republic'⁶, with the archival signature ME DACG IAK UPM. It contains the records created in the office of the Venetian authorities, situated in Kotor from 1420 to 1797⁷. The chronological limits of this particular archival fond are from 1684 to 1797, namely until the end of Venetian rule in Dalmatia. The Extraordinary Governor for Kotor and Albania was responsible for managing the territory of the Kotor Bay, including some other towns in the coastal area (Budva, Paštrovići, Grbalj) or in its

⁵ The full value of the project was estimated at € 51.302,00. The donor (Veneto Region) first approved € 15,000 for the project in 2010: the funds were paid to the NGO Notar in two tranches during 2011 and in mid-2012. Both NGOs applied again in 2010 for funding of projects to be implemented during 2011. The donor approved € 20,000 for the second phase of the same project at the beginning of 2012: it too was paid in two instalments. This second phase finished on 30th April 2013.

⁶ In the Montenegrin language: Upravno-politički spisi vanrednih providura Mletačke republike (UPM) and in Italian: Atti del Proveditore straordinario di Cattaro e Albania con la Soprintendenza di Castel Nuovo (see MILOŠEVIĆ 1977, 24-32).

⁷ Boka Kotorska, together with neighbouring southern region and a part of the Albanian coast, was a separate administrative unit of the Republic of Venice, called 'Venetian Albania' (*Albania Veneta*). Venice reached the maximum extent of its overseas possessions, the *Stato da Mar*, during the 1480s. In the series of Venetian-Ottoman wars that followed from 1479 to 1573, the Venetian dominion in the Adriatic Sea was seriously reduced. Venice lost in the south all of the Albanian coast, apart from merely the area around Boka Kotorska (Perast, Kotor) and Budva. This area was named *Albania Veneta* (MILOŠEVIĆ 1974).

hinterland (Pobori, Maine, Brajići) in what is present-day Montenegro⁸. For centuries, this region, when under Venetian rule, formed the border area with both the Ottoman Empire and the old Montenegrin state⁹.



Fig. 1 Condition of the archival fond (photo by the author).

The documents in the archival fond are mostly administrative, diplomatic, political and military in character. The correspondence of Extraordinary Governor with the Bailo, magistrates, consuls and prelates is of particular importance, as well as that with the representatives of Turkish rule in Albania and others situated in the towns of the Turkish part of Montenegro and in Bosnia and Herzegovina. There are also many specifically significant

⁸ The Extraordinary Governor represented the Venetian government, with the rector, and was situated in Kotor. This function was established in 1684, and Extraordinary Governorship then acted like a permanent institution for resolving temporary *ad hoc* situations. After the re-conquest of Herceg-Novi in 1687, a representative of Venetian authority was established in this town – a ‘superintendent’ subordinate to the Extraordinary Governor in Kotor.

⁹ In this area, the borders between the two Empires, Ottoman and Venetian, changed during the period of Venetian presence on the eastern coast of the Adriatic Sea. One part of Kotor Bay was conquered by the Ottomans in 1482, when the Turks occupied Herceg-Novi (Castel Nuovo), the town at the very entrance to the Bay. Their rule lasted for 200 years, until 1687, with a short break between 1538 and 1539 when the town was taken by the Spaniards. After the Turkish conquest of Herceg-Novi, the nearby town of Risan shared its destiny, surrendering to the Ottomans, and also remaining under the Turkish rule until 1687. In that period the small town of Perast was the border town between the Ottomans and the Venetian Republic. During the Fourth Ottoman-Venetian War, also known as the War of Cyprus, in 1571, the Venetian Republic, being unable to defend the entire Adriatic coast, was forced to conclude a separate peace treaty with the Ottomans granting them two towns, Bar (Antivari) and Ulcinj (Dulzigno). Thus, the village of Spič became the southern border between the Ottoman Empire and the Venetian Republic, and this border remained in place until 1878. The Ottomans were present also in the southern part of the Kotor Commune, in the very important region named Grbalj, from 1497 to 1647, and again from 1702 to 1715. See STANOJEVIĆ, VASIĆ 1975.

documents concerning the military conflicts between the united Christian states, headed by the Republic of Venice, and the Ottomans, as well as between Montenegro and the Ottomans. The archival fond contains data related to the activities of the Venetian Republic in organising the resistance against the Turkish military forces, by raising troops of brigands (*hajduk*) of Christians who had escaped from the Turkish territories. Furthermore, there are details about epidemics, piracy, everyday activities of brigands, the control of maritime and caravan trade activities in this part of the Adriatic Sea, negotiations between the Turkish and Montenegrin authorities and the Venetian ones, intelligence service activities on the movements of the Turkish army in this area over several centuries, etc. There are also many records from judicial processes, health regulations and measures in general from political and social life. Some folders contain the registers of terminations and mandates of the Extraordinary Governors.

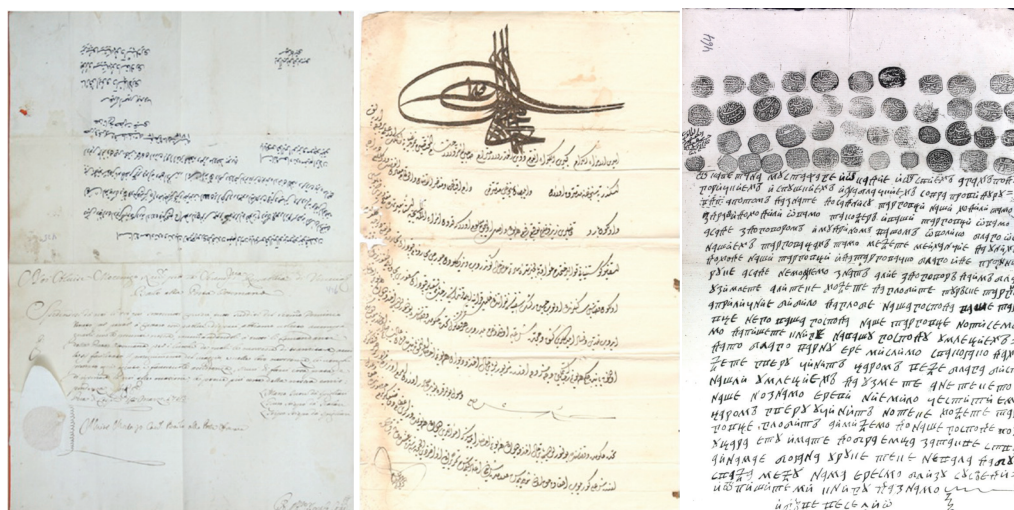


Fig. 2 Correspondence with the Turkish authorities from the border area with the Republic of Venice.

Moreover, there are many documents about land ownership, in the form of land registers especially for the surveys carried out in the territory of the towns of Herceg-Novi (Castel Nuovo) and Risan (Risano) when they were re-conquered by the Venetians, after being for some two centuries under the Ottoman rule. Much data exists on transfers of land ownership from the Turks to the Christian population (Venetians) after the regaining of the Turkish territories, as well as about the population resettlement from the territories

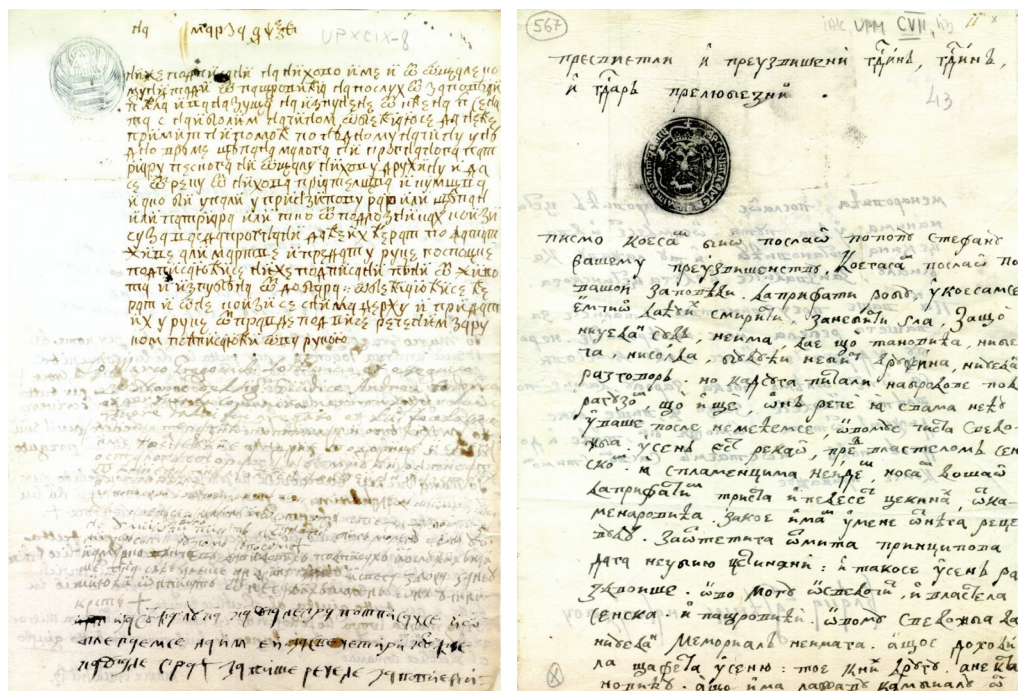


Fig. 3 Correspondence of the Montenegrin authorities.

under the Turkish rule, the colonisation of the Venetian territory on the eastern Adriatic zone, and about the processes of land improvement, etc. There are many to do with sales agreements and various documents on property and legal relations. In addition, it is generally known that the Venetian cadastres were formed in accordance with territorial changes made in the whole of Dalmatia during the Venetian-Turkish wars, including this southern region. Supplementary documentation is preserved in Zadar (Residence of the General Governor for Dalmatia) and in Venice¹⁰.

¹⁰ From the very first cadastre from 1421, through the surveys of territorial gains in the Cyprus War (1570-1573), the War of Candia (1664-1669), the Morean War (1684-1699) and the so-called Small War (1716-1718) right up until the establishing of Grimani's cadastre, the Venetian Republic was recording all the territorial, demographical and land-property changes in the land of Dalmatia (see more: SLUKAN-ALTIC 2000). The oldest cadastral document preserved in Kotor Historical Archives is 'Catasticum carubbionorum Zoppe de Gherbili, Communitatis Catari', from 1430, the official legal document of the property, with the land division and the list of landowners: noblemen and citizens from Kotor, as well as the Kotor Commune.

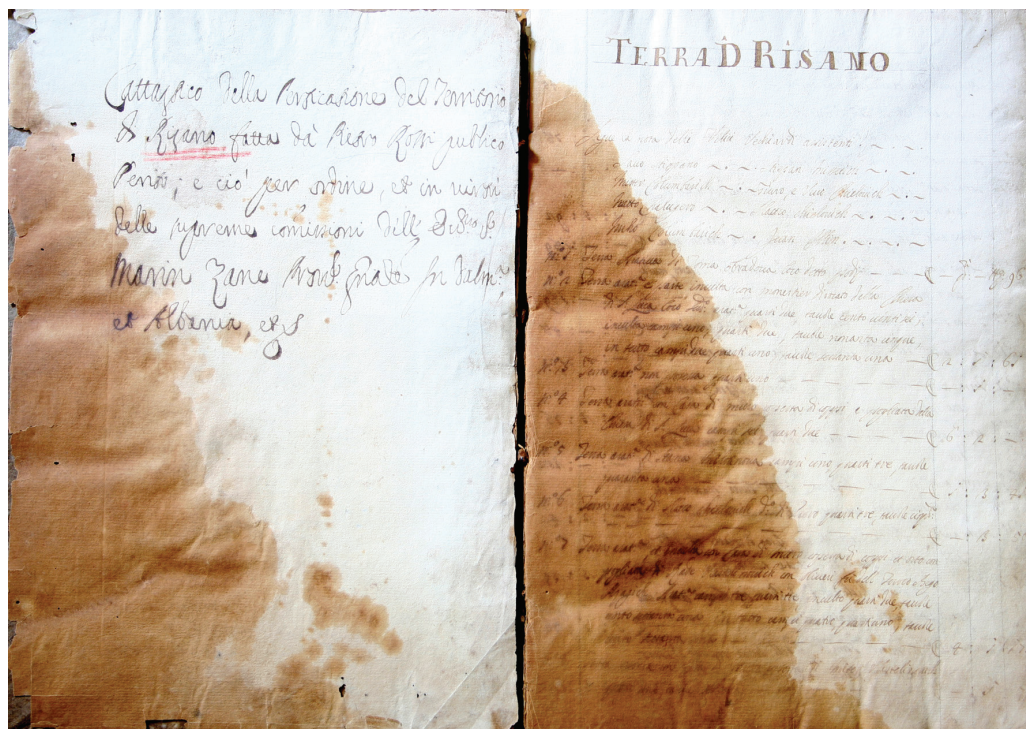


Fig. 4 Surveys carried out in the territory of the town of Risan (Risano), 1704.

Thus this archival fond is the mandatory source for a thorough understanding of the economic, political, social, and cultural relations in this region during its very turbulent history. The fond represents a very valuable source for demographic studies, especially documents from the period of the Candia and Morean Wars, and not only in the area of Kotor Bay, but also in the wider region that belongs nowadays to various states: Montenegro, Bosnia and Herzegovina, Serbia, Kosovo, Albania, Italy, and even Turkey.

The documents in this archival fond are mainly written in Italian languages, but there are many in the Old Slavic and Turkish tongues (written in Cyrillic and Ottoman alphabets)¹¹.

¹¹ Usually, the representatives of the Turkish rule wrote documents in the Old Slavic language in the Cyrillic alphabet, but with Turkish seals and signature.

3. Selection of suitable software tools for processing the historical archival material preserved in Kotor and Montenegro

In the Kotor Historical Archives¹², one of departments of the State Archives of Montenegro since 1992, is stored documentation dating back to the year 1309. The majority of the archival material was created during the presence of the Venetian government in this area of the Kotor Bay. Unfortunately, the State Archives of Montenegro has no software for the processing of its archival material. In 1999, the State Archives of Montenegro, in cooperation with the Faculty of Mathematical Science of Montenegro, created an information system for the Archives (ARHIS), which, unfortunately, has never been implemented¹³. Several years ago, too, the State Archives cooperated with the Croatian State Archives in trying to test and implement the pilot project of their information systems (ARHINET), but without any concrete results up till now.

Given the fact that the oldest documentary heritage of the whole of Montenegro is stored in the archives and libraries in Kotor, the NGO Notar from Kotor was searching for possibilities to find and implement a suitable software for the processing of these holdings. It is important to emphasise that the documentary heritage preserved in Kotor and its surroundings was created mostly during the four centuries of Venetian rule: thus it is written in Latin and Italian languages, i.e. Venetian dialect. However, even during the presence of other states in this area, Italian was retained as the administrative language too. Therefore, our documentary heritage is similar to the ones created in the Veneto Region and in Dalmatia during the centuries of the shared political system and destinies. So, naturally we were trying to find software designed for similar archival material and we were looking for it from Italian producers. We rapidly came across the information about the *Arianna programme*, a product of the Italian company Hyperborea from Pisa¹⁴, on the Internet; we then decided to ask them for a collaboration.

In addition to the historical material in the Kotor Historical Archives, in Montenegro a good deal of historical archival material is preserved too (in other state and church institutions and in private collections in other towns), which could be processed by using the new technologies. That is why we thought it sensible if the program *Arianna3* and *AriannaWeb* could be shared by all potential users in Montenegro. Thus, in May

¹² About Kotor Historical Archives and its holdings visit: <http://poincare.matf.bg.ac.rs/iak/iak.htm>.

¹³ PEJOVIĆ 2003.

¹⁴ Hyperborea from Pisa, Italy, is a company that has operated since 1995 in the ICT sector, applying computer technologies to the environment and cultural heritage fields. Hyperborea produces its products, solutions and services for the cultural heritage sector: the application fields are historical and repository archives, museums and libraries (<http://www.hyperborea.com>).

2009, the NGO Notar organised a presentation of *Hyperborea's* products and services in Kotor¹⁵.

4. About Arianna3 and AriannaWeb software for archival sector

Arianna3 and *AriannaWeb* are the software tools that the experienced Italian company Hyperborea s.r.l. has produced for a long time, for the need of the archival sector (created in 2000)¹⁶. They are produced within one out of three business units that comprise Hyperborea – that named Cultural Heritage which is involved in the accomplishment and supply of software and services for archives, museums and libraries. The software has been installed and used in more than 300 historical archives, private and public, around Italy.

Arianna3 is the software tool for the description, arrangement and indexing of archives¹⁷. It is a modular application that operates respecting the international ISAAD (G) and ISAAR (CPF) standards¹⁸. *Arianna3* employs evolved technologies, such as the XML/EAD standard¹⁹, which guarantees the interoperability with other kinds of systems and software. It is a product which performs archival operations for every type of archive and with different modes of retrieval. This software possesses an adaptability to accommodate different archival realities and in different contexts, as well as employing systematically the use of a control dictionary. When it comes to the description process in terms of functionalities, the software has the following features: duplication of similar typologies, customizable interface, and contextual help online. Its advantages thus are: the data model helps the archivist, permitting

¹⁵ 'Digitisation and valorisation of cultural heritage: tools, methods, technologies (archives, libraries, museums)' was the title of the information-educational workshop organised by the Italian companies – Metis System from Rome, (<http://www.metis-group.com>), M.I.D.A. Informatica from Bergamo (<http://www.midainformatica.it>), Hyperborea from Pisa, and NGO Notar from Kotor – in May 2009 – at Kotor. (See more: <http://www.cdknotar.org/en/news/127-workshop-on-digitization-of-cultural-heritage-held-in-kotor> (consulted August 28th 2017).

¹⁶ The software tools have been developed in a scientific context, in the Scuola Normale Superiore of Pisa, and after that they have been transformed into actual products for the marketplace. Thus today they represent the guarantee of quality of the products that reflect the aim to apply the IC technologies to the cultural heritage sector, in particular to the archival field (historical archives).

¹⁷ *Arianna3* is available in two versions: the stand alone, installable in a single workplace for individual work; and the server client, installable on a local network, for the cooperative work of multiple users.

¹⁸ *ISAD (G) General International Standard Archival Description*, 2nd ed. (<https://www.ica.org/en/isadg-general-international-standard-archival-description-second-edition>); *ISAAR (CPF) International Standard Archival Authority Records for Corporate bodies, Persons and Families*, 2nd ed. (<https://www.ica.org/en/isaar-cpf-international-standard-archival-authority-record-corporate-bodies-persons-and-families-2nd> (consulted August 28th 2017).

¹⁹ MICETTI 2005, in particular the chapter 'Descrizione archivistica codificata' (<http://www.loc.gov/ead>) (consulted August 28th 2017).

a fast description of activities, and the result is more precise and uniform. There is both a logical and a physical structure to it. In manipulating the arrangement of archives using this software, it allows one to modify in every possible way the resultant tree-representation, it is possible to manage the work globally at any time, to perform automatic arrangements of archival units by different criteria (sorting and filtering), to manage critical and unordered situations, and to make arrangements in a virtual way and simply. Regarding the process of indexing, there are two avenues: simple index (based on index entries – people, corporate bodies, places – available in all units of description: typologies, roles and occupation) and complex index (based on typologies of people, corporate bodies, places). The functionalities of this operation are: to facilitate detection of entries, to achieve the automatic amalgamation of the same entries, with many other practicalities to support their normalisation. The main advantages accruing are that it is possible to choose the type of index, simple or complex, and it is possible to make a complex index speedily. Finally, it should be underlined that *Arianna3* uses a tree-representation to virtually reproduce the structure of an archive; moreover through the topographic map the user can always see the physical collocation of the documentation.

AriannaWeb is a tool that enables the interactive publication of an archival database on the Internet. It is a software strictly related to *Arianna3*, but *AriannaWeb* can manage databases produced with several different archival tools: it uses the XML/EAD standard to preserve and maintain for a long time the documentation in a digital format. *AriannaWeb* is a web application created for the on-line integrated publication of archival descriptions and images, employing software for the fruition of artistic and cartographical heritages on the Web, so that one may publish and consult on the Internet archival descriptions and high resolution images. It guarantees any user or enterprise the possibility of preserving, valuating and managing documentary heritages of historical archives.

AriannaWeb's interface reproduces an archival structure, allowing a rapid navigation through the stored material: it presents the archival descriptions in a contextualised way, provides rapid researches through a Google-like engine and allows the visualisation of high-resolution images associated with the archival description. From a technological angle, the adoption of the XML/EAD standard and the integration of the open-source solution IIPImage for the visualisation of images²⁰, all make *AriannaWeb* a vanguard technology for its sector.

After the above-mentioned presentation in Kotor, and responding to the interest shown by experts from Montenegrin institutions, state and church alike, that have to deal with archival, library and museum material, we were encouraged to translate the software *Arianna3* into the Montenegrin language to enable its use for Montenegrin archives.

²⁰ <http://iipimage.sourceforge.net> (consulted August 28th 2017).

5. Experiences with the Montenegrin language translation of Italian software *Arianna3*

In order to use the Italian software to process the documents in Montenegro, it was necessary to make a translation into the Montenegrin language. Thus, a cooperative agreement was signed between the company Hyperborea -Pisa and the organisation Notar-Kotor. Essentially, this work was an introductory stage in a common project of digitisation that would be done in future with the provision of some financial support.

The Montenegrin translation of the Italian software for the archival sector represents an important meeting between two different archival traditions, the Italian and the Montenegrin, from the technical and conceptual points of view. In the first, all the software interface elements had to be translated to allow the complete use of the Montenegrin language. For the second, the way of operating and the archival concepts had to be exported, examined and used. This work also represented an important evolution for the dissemination of the software outside the Italian context, something that was an important goal for the company Hyperborea in establishing an international platform for *Arianna3* and *AriannaWeb*.

According to the cooperation agreement, the translation was entrusted to the author. Before I started with the work on the translation, it was necessary to become more familiar with the programme of *Arianna3*. Thus, I spent several days with the company Hyperborea in Pisa. My training was carried out on the program in the Italian language: the description of two fonds from the Kotor Archives were used as an example for insertion, and were also translated into Italian. Working in Italian solely did however limit my ability to fully master the technique of entering the data and to comprehend all the pluses and minuses of the programme in implementing our own archives.

The next phase of the work was to input all the words and sentences into Excel sheets, which was done at Hyperborea. The colleagues who worked on it remarked that it required a lot of time and effort. At the same time, as part of this translation, a short version of the handbook needed to be prepared. At the start, however, only the programme in Italian language and drawn words and sentences in Excel, in Italian and English versions were available.

The translation into Montenegrin was somewhat generalised in many instances, with the use of many synonyms. During the work I found that the terms and phrases in the Italian version were partially or completely different from what resulted, when translated into English. So, I had to decide whether to translate the Italian text, or the English one. However, it was difficult out of context to determine which cases, gender, plural or singular and similar, you were advised to use, all characteristics which are in our language very critical.

| | ITALIANO | ENGLISH | CRNOGORSKI | ANNOTATIONS |
|-------------|--|--|--|-------------|
| <u>1</u> | a seconda delle dimensioni dell'archivio questa operazione può richiedere anche diversi minuti | according to database dimensions this operation may take several minutes | zavisno od veličine baze podataka ova operacija može oduzeti nekoliko minuta | |
| 2 | a testo libero | full text search | pretraživanje čitavog teksta | |
| 3 | abilita | enable | omogućiti | |
| 4 | adatta alla finestra | fit to window | prilagoditi prozoru | |
| 5 | backup | backup | napravi rezervnu kopiju | |
| 6 | cambio fase di vita per le unità archivistiche | change lifecycle of archival units | promjena životnog ciklusa arhivske jedinice | |
| <u>1383</u> | voci d'indice completo (solo voci d'indice non collegate) | index entries complete (not linked index entries only) | puni indeks unosa (samo nepovezani indeksi unosa) | |

Fig. 5 An example of the translation of the software.

After I had done the translation into Montenegrin, we decided to prepare the text in Latin and Cyrillic lettering, because both of them are used in parallel in Montenegro. Moreover, with the but small alterations in expressions and dialect, the translated programme *Arianna3* can be used in the former Serbo-Croatian language too.

| | ITALIANO | ENGLISH | CRNOGORSKI Latin letter | CRNOGORSKI Cyrillic letter |
|-------------|--|--|--|--|
| <u>1</u> | a seconda delle dimensioni dell'archivio questa operazione può richiedere anche diversi minuti | according to database dimensions this operation may take several minutes | zavisno od veličine baze podataka ova operacija može oduzeti nekoliko minuta | Зависно од величине базе података ова операција може одузети неколико минута |
| 2 | a testo libero | full text search | pretraživanje čitavog teksta | Претраживање читавог текста |
| 3 | abilita | enable | omogućiti | Омогући |
| 4 | adatta alla finestra | fit to window | prilagoditi prozoru | Прилагоди прозору |
| 5 | backup | backup | Napravi rezervnu kopiju | Направи резервну копију |
| 6 | cambio fase di vita per le unità archivistiche | change lifecycle of archival units | promjena životnog ciklusa arhivske jedinice | Промјена животног циклуса архивске јединице |
| <u>1383</u> | voci d'indice completo (solo voci d'indice non collegate) | index entries complete (not linked index entries only) | Puni indeks unosa (samo nepovezani indeksi unosa) | Пуни индекс уноса (само неповезани индекси уноса) |

Fig. 6 The translation into Latin and in Cyrillic letterings.

It will be useful to mention some difficulties which I faced during this work of translation:

- The programme in Italian and drawn words and sentences in Excel (in Italian and English versions) were available in two completely separate formats.
- During the work I found that the terms and phrases in the Italian version were partially or completely different from its translation into English.
- It was difficult to separate the terms that were purely IT terms from the archival ones.
- For translation of IT terms one should find and provide an appropriate technical dictionary. Unfortunately none exists in Montenegro yet, so I used some glossaries published in the Serbian and Croatian languages²¹.
- Lack of archival terminology glossary is to be noted in Montenegro, but also in our environment, in the former Serbo-Croatian language area.
- It is hard to find adequate words in Montenegrin for IT terms, if one wishes to avoid widespread use of Anglicisms in a computer language in Montenegro.
- When the translation was inserted into the program by Hyperborea, only then it was possible to see exactly what needed to be changed or refined in translation. Certain parts of the texts in the translated version remained unchanged, i.e. that in the Italian language, despite the ease with which the programme automatically can change languages by copying of the appropriate files to the programme installation. For example, many drop-down menus, some titles, etc. usually the ones for automatic insertions.

It is clear that the translation of the programme *Arianna3* is a very complex job and it should be conducted in teams by archivist or archivists – translators and programme creators, as well as their already experienced users – viz. Italian archivists. However, as this was a pioneering job in the field of archival profession not only in Montenegro, but in the wider area, it still succeeded in attracting the attention of many experts in the archival world, as well as ones from the field of computer science²².

It should be emphasised that, so far, the translation of the software *AriannaWeb* has not been achieved. We hope that it will be through further cooperation between the organisations Notar and Hyperborea, when we find adequate financial support.

²¹ AAVV 2016; Kiš 2006. Also there were used: ILLINGSWORTH 1997; WALNE 1988; ANDROIĆ 1972.

²² PEJOVIĆ 2009; 2010. The Autumn Archival School in Trieste in November 2009, organised by the International Institute for Archival Science Trieste, Maribor. IIASTM is a postgraduate training course. That year it was on the issues relating to the archives in the 20th century (1900-2000), professional aspects and technical-scientific aspects (see more: <http://www.iias-trieste-maribor.eu/index.php?id=78&L=1>, consulted August 28th 2017).

6. Applying the software Arianna3 and AriannaWeb to the archival material of the Kotor Historical Archives

Since some of the funds for the project in the Kotor Historical Archives came from the donor – Veneto Region²³, we engaged two companies from Italy as our collaborators, without which we could not perform the project. They are, as already mentioned, Hyperborea from Pisa and M.I.D.A Informatica from Bergamo²⁴. We have to emphasise here that in Montenegro there are no similar companies or IT specialists capable of offering programmes and services in the field of digitisation of cultural heritage, especially concerning archival material. Thus, alongside the two Italian companies, the two NGOs from Kotor implemented the project of digitisation of the archival fond ‘Records of the Extraordinary Governors for Kotor and Albania during the Venetian Government’, and its web publication beginning in September 2011. All project stages were performed in both the Montenegrin and Italian languages.

During the project implementation (first and second phases), the following activities were undertaken:

1. Examination and numeration of each folder of the archival fond to make a detailed description.
2. Cataloguing of all folders in Montenegrin, using the translated version of the software *Arianna3*.
3. Translation of the existing archival descriptions and inventories written in Italian, and their cataloguing using the original (Italian) version of the software *Arianna3*.
4. Digitisation of documents from 21 folders (28,870 pages). Image verification and counting at the end of the digital capture.

²³ See more: footnote n. 2.

²⁴ <http://www.midainformatica.it>. The company was founded in 2000. The fields of work in which M.I.D.A Informatica has most experience is digitisation, cataloguing, archiving and promotion of cultural heritage. Its special offer is turnkey projects, including all aspects of a project: organisation and methodology, either the digital recording of cultural heritage or the indexing of it. M.I.D.A Informatica uses professionals for the recording and acquisition of digital images, recording is always performed at the client's location, the processing of digital images in client's office is always under the supervision of M.I.D.A.'s qualified personnel. The company acquired the certification, in 2005, UNI EN ISO 9001:2000, being specified for the process of a computerised cataloguing of cultural heritage and its presentation. They have developed E-Gallery, which is an intranet/internet application that enables the on-line publication and visualisation of very high resolution images; it also provides a link to pre-existing cataloguing databases. In addition, they made a specific product for the video-referencing of bound books, MidaBook, a system that is able to present any kind of digitalised publication in a virtual-book format.

5. Indexing, i.e. compiling image metadata. At the end of the metadata compilation work, a further systematic and automated verification of all processed data was carried out.

6. Various other support activities necessary for the project implementation.

6.1. Examination and numeration of each folder of the archival fond to make a detailed description.

In this activity we performed preparatory jobs – the examination of all 208 folders, i.e. 228 volumes: current condition of the documents inside each volume, the exact number of documents, number of unbound documents inside each volume, notes on damages of documents and ligatures, collection of all other relevant data to make a description according to archival standards.

The next step was a review of the archival fond in accordance with the needs for computer processing by software *Arianna3* and *AriannaWeb*: data about the location of the fond, condition of its arrangement, existence and type of finding-aids, authors of finding-aids, restoration, integrity of archival fond, omissions and errors in archival signatures, disorder of physical location of folders and documents, type of bindings and kinds of damages, situation with preservation of documents, etc. Also we regularised some other data, like the names of Extraordinary Governors and other representatives of Venice administration, the amount of documents written in other languages, like Old-Slavic or Turkish ones, etc.

6.2. Cataloguing of all folders in Montenegrin language using the translated version of the software Arianna3.

After the initial analysis, we made the description of the entire fond and each separate volume in it, recording all necessary characteristics, in order to be able to implement the computer cataloguing, defining the use of controlled vocabularies and customising the user interface of the software *Arianna3* for the description and arrangement, in its Montenegrin and Italian versions. First we created an *ad hoc* database and then we formulated the logical tree to represent the sorting of the archival fond. Subsequently we started inputting the information about archival units in the Montenegrin language. The model of description of the class hierarchy requires the following data entry fields: 1. Cataloguing of fond (title, chronological limits, quantity of archival units and linear metres, name of creator, name of holder, description of content, description of documentation: proprieties of material, location, condition of preservation, finding-aids); 2. Cataloguing of logical aggregation (type of aggregation: series, category, chronological limits, quantity of archival units); 3.

Cataloguing of archival units (reference code, collocation, chronological limits, proprieties of material and description of ligature and condition of documentation, numbering and survey of quantity of document, title of archival unit, indexing of the names of governors with chronological data, condition of preservation with data on restoration interventions, existing finding-aids, names of authors of finding-aids, characteristics of document, languages, letters, location).

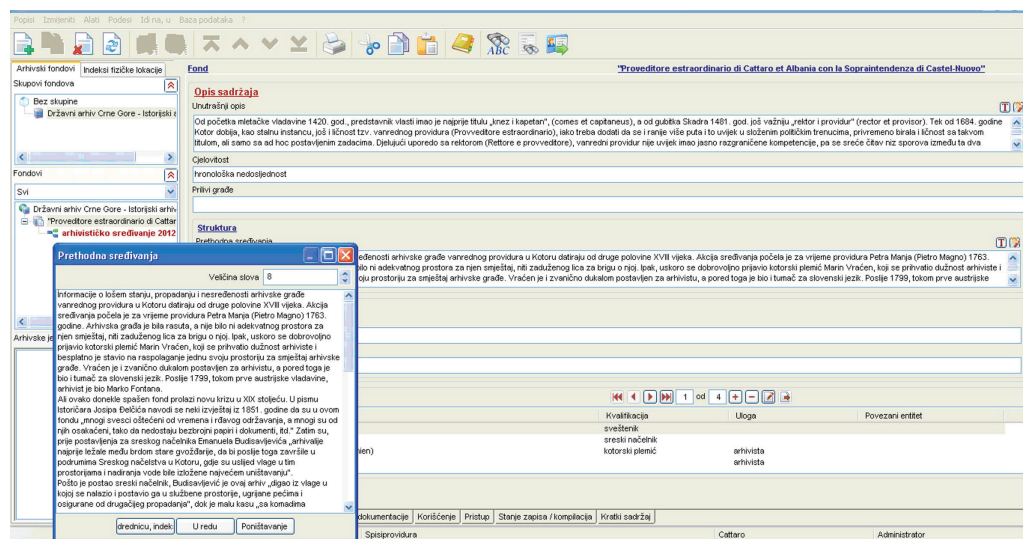


Fig. 7 Cataloguing in the Montenegrin version of *Arianna3*.

6.3. Translation of the existing archival descriptions and inventories written in Italian, and their cataloguing using the original (Italian) version of the software *Arianna3*.

The Italian translation of the cataloguing was performed by two archivists-translators during the same description phase as the Montenegrin language, so that by working together we could quickly proceed and integrate archival and linguistic remarks, having immediate feedback in both languages²⁵. With those activities we ensured that data from an important archival fond could be consulted by a wider circle of researchers from different countries.

²⁵ The translation of all description data of the archival fond, originally written in Montenegrin, into Italian was performed by archivists from Kotor Historical Archives: Snežana Pejović, Jelena Strahinja and Joško Katelan, with the ongoing consultation and assistance of the archivists from Hyperborea, Angela Fuggi.

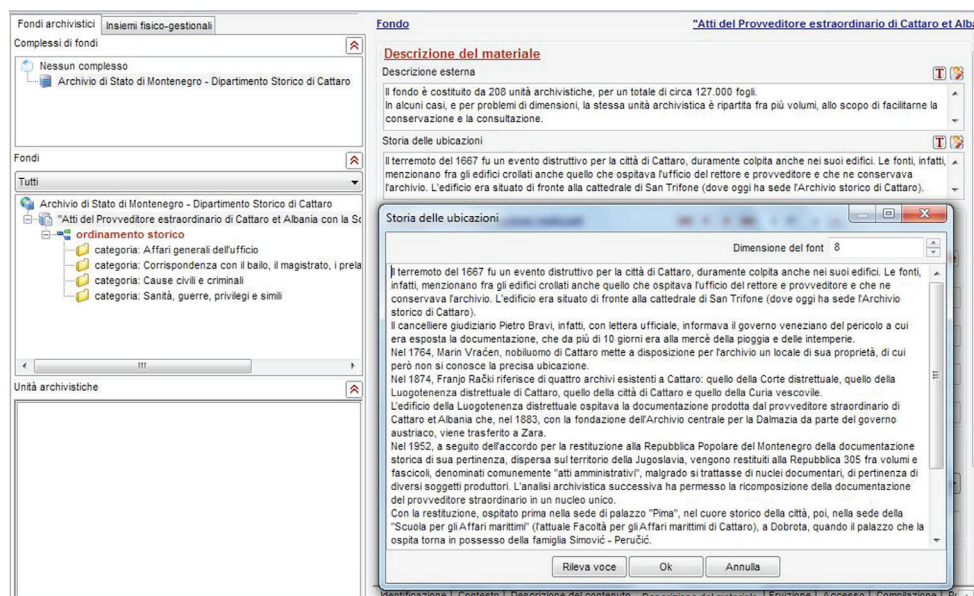


Fig. 8 Cataloguing in original version of software, with data translated into Italian.



Fig. 9 Cataloguing in two languages, Montenegrin and Italian archivists working side by side (in Kotor Historical Archives, photo by the author).

During the data entry, three archivists from Kotor Historical Archives modified and improved the existing translation of *Arianna3* in the Montenegrin language, identifying in the course of the practical software implementation all deficiencies remaining in the first version of the translation. The corrections were entered on Excel sheets and the IT specialists from Hyperborea inserted them in Montenegrin version of software *Arianna3*.

6.4. Digitisation of documents

The M.I.D.A Informatica experts carried out the digital image acquisition in the Kotor Historical Archives. For this purpose they used the scanner planetarium Metis DRS 5070 Book²⁶.

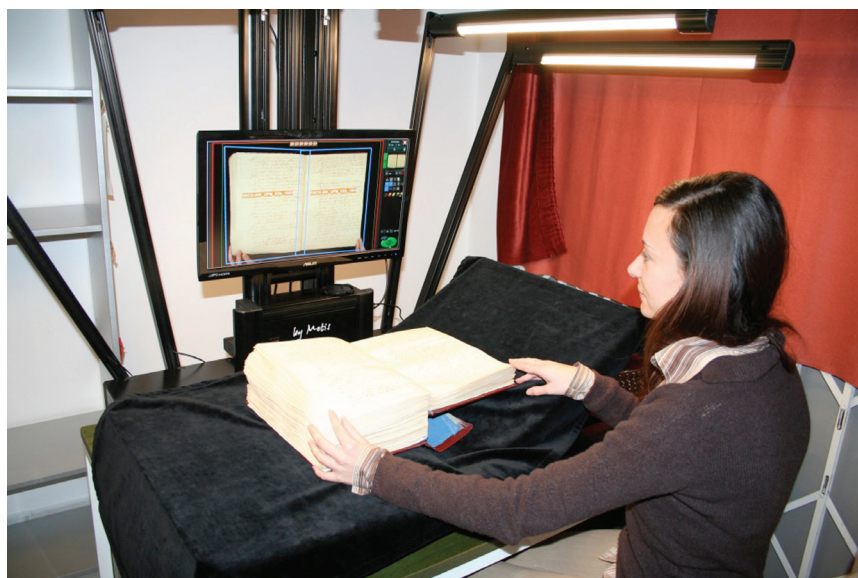


Fig. 10 Digitisation in the Kotor Archives, performed by M.I.D.A. Informatica IT specialist, using the Scanner Metis DRS 5070 Book, produced in Rome (photo by the author).

²⁶ This is a product of the company Metis System from Rome (<http://www.metis-digital.com>). The scanning system of DRS 5070 Book is equipped with a sensor that allows a professional optical native resolution of 400 dpi on the entire format, just exceeding 50x70 cm. Among the most important features is the lighting system SynchroLight, active only during the scanning process. It is suitable for old and fragile books with limited opening angle and without using glass. This is enabled through the integration between the software, the book cradle, a special accessory and the DRS-specific optical and light design. See more: <http://www.metis-digital.com/html/English/Products%20Main.html> (consulted August 28th 2017).

We shall mention the several basic steps in the process of digitisation:

1. Preparation activities: setting up of the space intended for scanning, in consultation with the client: security of space, presence of possible sources of vibration, interference caused by lighting, access to the space, its capacity, provision of free access for the M.I.D.A.'s staff during the working hours, transport and installation of the scanner, its configuration and calibration, installation and configuration of the work-station and storage media.

2. Routine and repeating activities of the digital image acquisition process, and control of the work: carrying out of a routine maintenance scanner calibration, every scanning is always preceded by a pre-scanning in order to optimise the parameters of the image, such as exposure, contrast, gamma, highlights, etc. In the case of particularly sensitive material or a bad state of preservation, documents are digitised without contact with the crystal. M.I.D.A. applies a whole range of precautions to avoid damage of documents.

3. Periodic transfer of acquired data, completion of digital acquisition and closing of the workplace: digital copies acquired are periodically sent to the Image Elaboration Centre of Bergamo, but only after previously verifying that the back-up copy of data to be sent is present at the work-station. The transport service is entrusted to specialised couriers to deliver data disks, properly packed, to Bergamo, where the data are imported to the local conservation system, checking if the files TIFF 6.0 are valid. Every image will be opened and manipulated; when it is certain that the digital copy is correct, only then will the back-up copy at the work-station be cancelled. The scanner remains installed until each digital copy has been manipulated.

4. Post-processing and production of pyramidal format: the image processing package is Adobe Photoshop CS4 and its subsequent updates, under the procedures defined by an Adobe Certified Expert Consultant; the colour management system is based on the profiles of the International Color Consortium – ICC; the process of converting the format from file Master TIFF to format TIFF Pyramid is carried out; before making the compressed version of the images, tests are done to identify the most appropriate compression parameters for obtaining the required compactness, quality and readability of images.

6.5. Indexing and metadata compilation

For metadata creation, XML/MAG (Administrative Metadata Management) is used, conforming to the international standard, in this case, the version 2.0.1. The software *AriannaMag* is used for indexing²⁷.

²⁷ *MagMaker*, the product of Hyperborea, is recognised by the Central Institute for the Union Catalogue (ICCU) of the Ministry of Cultural Heritage of Italy.

At the end, a website hosting service is employed, and the storage of images carried out.

Only the first two phases are performed at the premises of the client; the others are carried out at the headquarters of the company M.I.D.A. in Bergamo.

7. Final results of digitisation and web publication of archival fond from the Kotor Historical Archives

As we have already explained, the implementation of the project lasted until April 30th 2013, when the two NGOs from Kotor had to submit a narrative and financial report to the donor, Veneto Region.

The final result of the project, the first of this kind undertaken in Montenegro, is available on the Internet address <http://arhivkotor.hdue.it>. The cataloguing performed was published on the web in both languages, through the software platform *AriannaWeb* with customised graphics.

Thanks to this project, all researchers and other visitors of the Internet from all around the world are able to browse the data relating to a very important period of historical events in this part of the Mediterranean, through the original documents and information contained in archival fond. The documents are available in high resolution with the possibility of enlargement. The program offers the opportunity for the opening of every digital image in a separate window, thus facilitating the transcription of sometimes extremely illegible handwriting and damaged parts of the text²⁸.

The worth of this project is not only the enabling of easier access to archival material kept in Montenegro, but also with the digitisation of this quite damaged archival fond we have taken measures for its protection. Thanks to the project, about 30,000 well-damaged originals in the Archives can be kept unopened, i.e. they can be consulted only in digital format. The digital images are stored on two external memories in the Kotor Historical Archives.

The singular value of this project is that it represents an end result of professional cooperation between two countries, Montenegro and Italy: an Italian new technological product in conjunction with Italian IT professional knowledge and expertise worked on archival material, created during the Venetian rule in Kotor Bay, and today curated and preserved in Montenegro, at the Kotor Historical Archives.

²⁸ Despite this being the first instance of the web presentation of archival cultural heritage in Montenegro, we have not been able to interest the Montenegrin State Archives or other government agencies, such as the Ministry of Culture to further develop this important project. Costs for hosting and maintaining web portals are high. The organisation Notar cannot pay Hyperborea for the next year's expenses, so that the web portal will be deactivated soon.



Fig. 11 Inventory of the archival funds in Montenegrin.

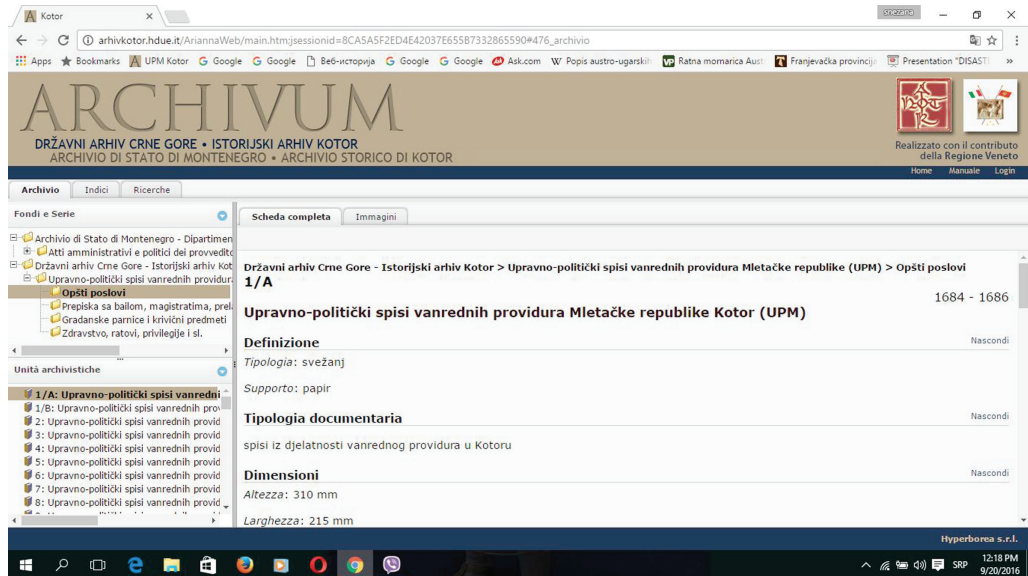


Fig. 12 Inventory of the archival funds in Italian.

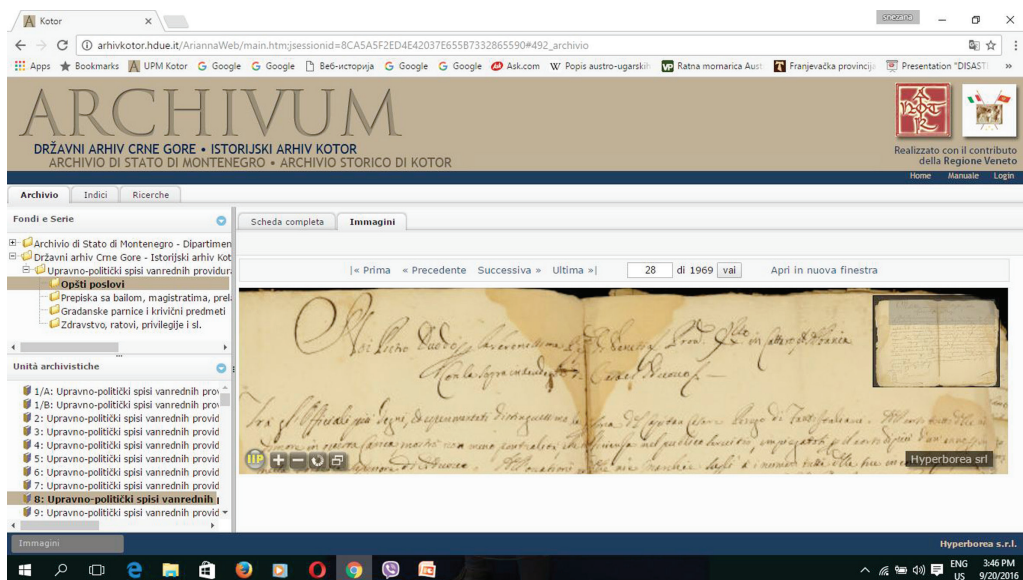


Fig. 13 Inventory and digital image of document.

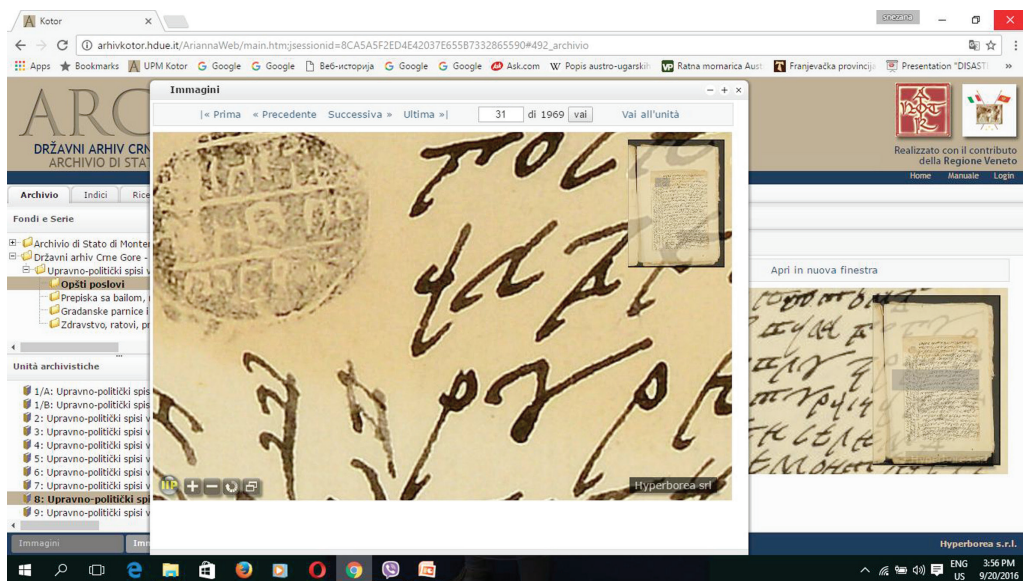


Fig. 14 Digital image of document in a separate window.

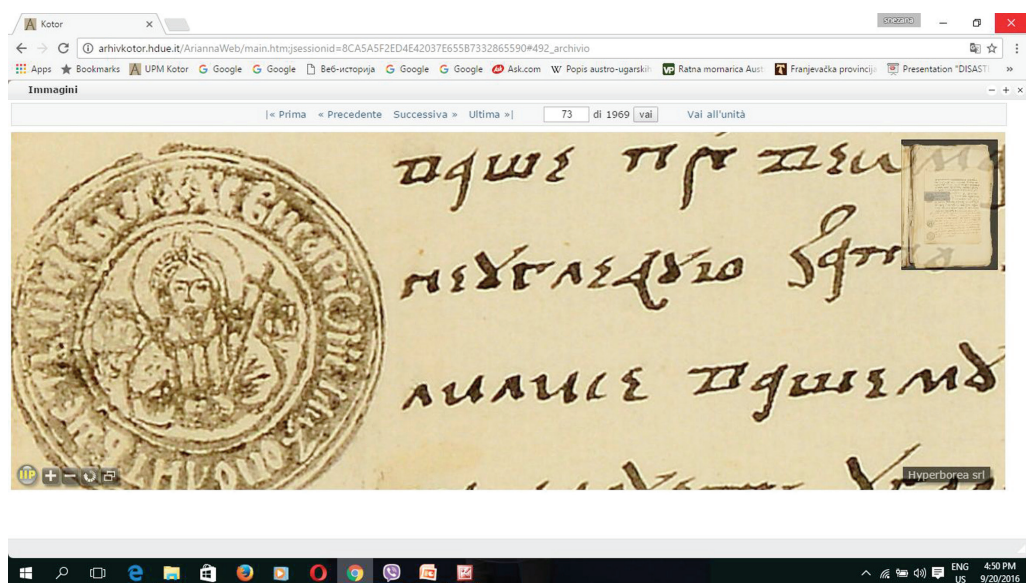


Fig. 15 Enlarged digital image of document opened in a separate window.
In the right hand corner: the frame for reading the certain part of enlarged document.

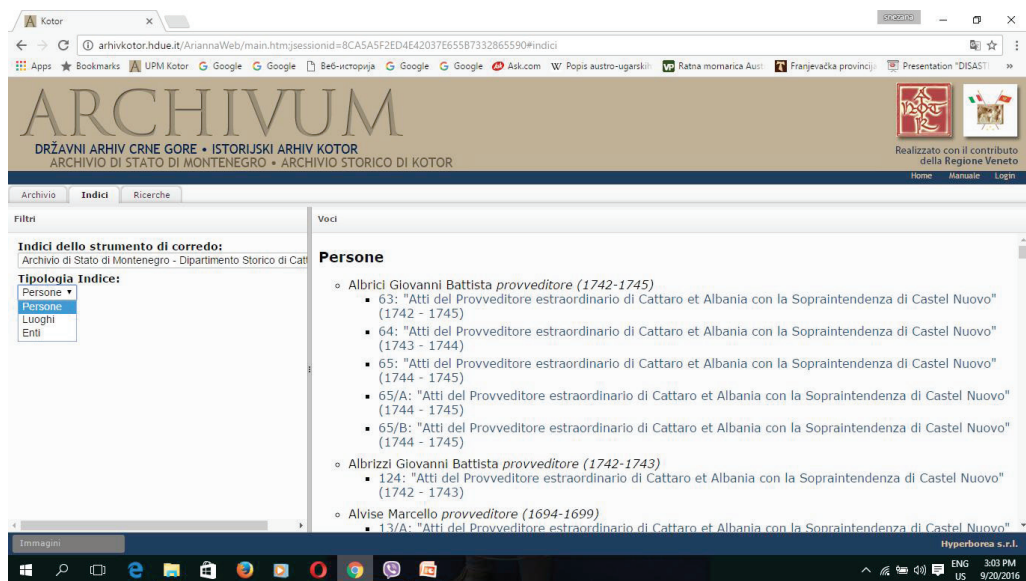


Fig. 16 Browsing through indexes.

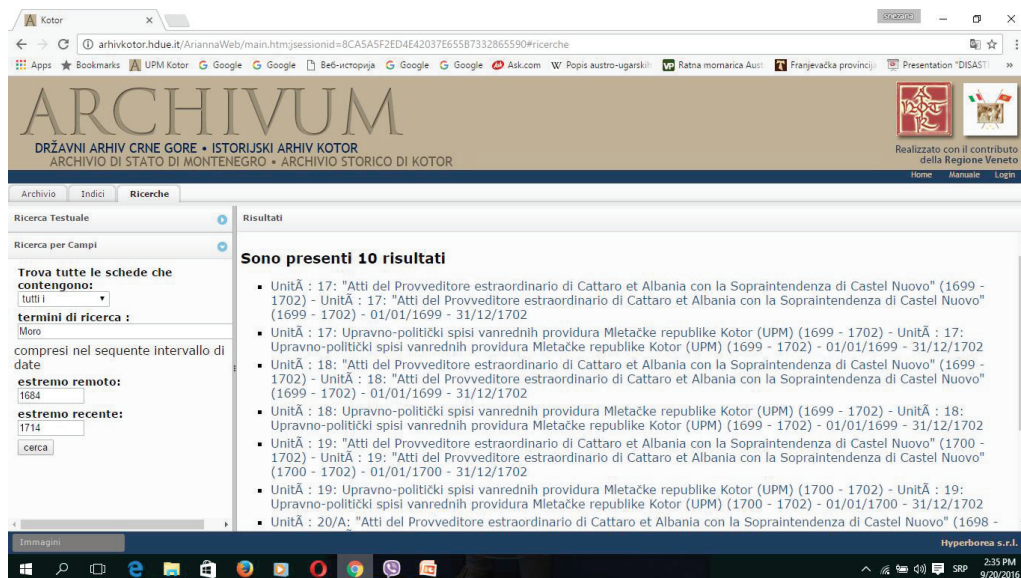


Fig. 17 Browsing through the finding-aids

BIBLIOGRAPHICAL REFERENCES

- AAVV 2016, *Microsoft's 'Computer Dictionary'*, Belgrade (1st edition 2003).
- ANDROIĆ 1972: M. Androić, *Rječnik arhivske terminologije Jugoslavije: hrvatsko-srpsko-slovensko-makedonski, englesko-francusko-njemačko-rusko-talijanski* i obradili i priredili Mirko Androić [et al.]; glavni i odgovorni urednik Mirko Androić, Zagreb.
- ILLINGSWORTH 1997: V. Illingsworth, *Dictionary of Computing*, 4th edition, Oxford.
- KIŠ 2006: M. Kiš, *Informatički rječnik za školu i dom. Engleski-hrvatski*, Rijeka.
- MICHETTI 2005: G. Michetti (ed.), *Descrizione archivistica codificata, Dizionario dei marcatori: versione 2002*, Roma, ICCU.
- MILOŠEVIĆ 1974: M. Milošević, *Boka Kotorska za vrijeme mletačke vladavine (1420-1797)*, Unpublished PhD thesis, Zadar.
- MILOŠEVIĆ 1977: M. Milošević (ed.), *Vodič kroz arhivsku građu sa sumarnim inventarima muzejskih i crkvenih fondova i zbirki*, Kotor.
- PEJOVIĆ 2003: S. Pejović, *Information sciences and historical archives, Atlanti 1-2*, Maribor, 89-99.

- PEJOVIĆ 2009: S. Pejović, La traduzione in lingua montenegrina del software italiano per la descrizione archivistica Arianna3, lecture held on the 'Autumn Archival School in Trieste' in November 2009, organised by the International Institute for Archival Science Trieste, Maribor (IIASTM) (<http://www.ias-trieste-maribor.eu/index.php?id=78&L=1>).
- PEJOVIĆ 2010: S. Pejović, Arianna3 and AriannaWeb. Software tools for the archival sector, the presentation held on the Fifth SEEDI Conference: Digitisation of cultural and scientific heritage, Sarajevo - Bosnia and Herzegovina (May 19-20, 2010). http://seedi.ncd.org.rs/events/SEEDI2010_presentations/May19/%5B23%5D%20Snezana%20Pejovic%20-%20Arianna%203%20and%20AriannaWeb,%20software%20tools%20for%20the%20archival%20sector/ (consulted 17th June 2019).
- SLUKAN-ALTIĆ 2000: M. Slukan-Altić, Povijest Mletačkog katastra Dalmacije, *Arhivski vjesnik* 43, 171-198.
- STANOJEVIĆ, VASIĆ 1975: G. Stanojević, M. Vasić, *Istorija Crne Gore, Knjiga treća : od početka XVI do kraja XVIII vijeka*, Vol. I, Titograd.
- WALNE 1988: P. Walne (ed.), *Dictionary of Archival Terminology: English and French; with equivalents in Dutch, German, Italian, Russian and Spanish/Dictionnaire de terminologie archivistique*, 2nd rev. ed., München-New York-London-Paris-Saur.