

The project of digitisation of old maps of Slovenian territory - librarianship and geodesy in cooperation

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60

Abstract: Projects of digitisation of cartographic material are a part of important projects of digitisation of the world cultural heritage, taking place in libraries, museums, and archives around the world. 20 most significant maps of Slovenian territory from the 16th to the mid 19th century were digitised within the pilot project of the Map and Pictorial Collection of the National and University Library in Ljubljana and Geodetics Institute of Slovenia. Various analogue-digital conversion procedures, including scanning and digital photography, as well as scanogram processing procedures were used during the project.

Maps of Slovenian territory in the Map and Pictorial Collection of the National and University Library

The Map and Pictorial Collection of the National and University Library in Ljubljana holds maps from the period from the 16th to the 19th century, which are precious for national identity, cultural heritage and historical development of the presentation of Slovenian territory.

Geographical territory of Slovenia bordering European geographic areas of the Alps, the Pannonian plain and the Balkans was a stage of great migrations, military and conquering raids and trade routes from the Romans up to 20th century. Therefore, we find Slovenia in maps throughout the history of cartography although its importance can not be compared to presentations of vital parts of Europe. The territory of the present-day Slovenia is most often a component of maps of the Eastern parts of Venetian bay, inner-Austrian states under the Habsburg crown, which it was a part of for 500 years, or the wider presentation of the Danube-basin. The central part of the present-day Slovenia constituted the Dukedom of Crain, the north-eastern parts were a segment of the Dukedom of Styria, the outmost northern parts were a segment of the Dukedom of Carinthia, while the western were ruled by the County of Gorz and Trieste.

The oldest cartographic works presenting Slovenian territory date back to the 16th century. Following the mysticism of the Middle Ages, the humanism and the renaissance with the development of natural sciences, new discoveries and the invention of printing represented a prospering period for geography and cartography (Harley and Woodward, 1987). Already in 15th century, the capital work of ancient perception of the world, *Geography*, written by Greek astronomer, mathematician and geographer Claudius Ptolemy, was translated and printed.

Introduction

Maps are not receptive to time, space or linguistic boundaries; they are eternal. Woven into life, sentiment and imagination of numerous civilizations, they are a political and military apparatus in the arms of states, artefacts of national expansions, discoveries and trade. They are both a scientific document and a work of art (Hartley and Woodward, 1987).

This is what makes them so special and gives them significance in collections of museums, galleries, and libraries. Through the digitalization projects started in the nineties of the 20th century, the collections are aiming to make them available to a wide circle of Internet users of various interests.

Important projects of digitisation of the world cultural heritage, the maps as well, are taking place in the biggest libraries of the world, such as the Congress Library, the National Libraries of Great Britain, France, the Netherlands etc. The most important materials are becoming available to everyone, at every moment, no matter of one's whereabouts.

Projekt digitalizacije starih karata slovenskog prostora - u suradnji bibliotekarstvo i geodezija

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Sažetak: Projekti digitalizacije kartografske građe su sastavni dijelovi velikih projekata digitalizacije svjetske kulturne baštine koji se odvijaju u knjižnicama, muzejima, arhivima širom svijeta. U sklopu pilot projekta Kartografske i grafičke zbirke Narodne i univerzitetske knjižnice u Ljubljani i Geodetskog instituta Slovenije digitalizirano je 20 najznačajnijih karata slovenskog prostora od 16. do sredine 19. stoljeća. U okviru projekta su primijenjeni različiti postupci analogno-digitalne pretvorbe sa skeniranjem i digitalnom fotografijom te postupci obrade skenograma.

Karte slovenskog prostora u Kartografskoj i grafičkoj zbirci Narodne i univerzitetske knjižnice

Kartografska i grafička zbirka Narodne i univerzitetske knjižnice u Ljubljani posjeduje karte iz razdoblja od 16. do sredine 19. stoljeća koje su dragocjene za nacionalni identitet, kulturnu baštinu i povijesni razvoj prikaza slovenskog prostora.

Geografski položaj Slovenije na dodiru važnih europskih prirodno-geografskih cjelina Alpa, Panonske nizine i Balkana je od Rimljana do 20. stoljeća bio poprište velikih seoba, vojnih i osvajačkih pohoda i trgovačkih puteva. Tako se nalazi na kartama kroz cijelu povijest kartografije iako se njegova važnost ne može mjeriti s prikazima vitalnih dijelova Europe. Prostor današnje Slovenije je najčešće sastavni dio karata istočnog dijela Venecijanskog zaljeva, prikaza unutarnjih austrijskih država pod Habsburškom krunom u čijem sastavu je bio 500 godina ili šireg prikaza Podunavlja. Jezgru današnje Slovenije je činila Vojvodina Kranjska, sjeveroistočni dijelovi su bili u sastavu Vojvodine Štajerske, krajnji sjeverni dio bio je u sastavu Vojvodine Koruške, a zapadni pod Goričkom grofovijom i Trstom.

Najstarija kartografska djela s prikazom slovenskog prostora u Kartografskoj i grafičkoj zbirci sežu u 16. stoljeće. Po srednjovjekovnoj zatvorenosti i mističnosti, humanizam i renesansa s razvojem prirodnih znanosti, novim otkrićima i izumom tiska predstavljaju razdoblje procvata geografije i kartografije (Harley i Woodward, 1987). Već u 15. stoljeću se prevodi i tiska kapitalno djelo antičkog spoznavanja svijeta *Geografija*, grčkog astronoma, matematičara i geografa Claudiusa Ptolemeja.

Uvod

Karte ne poznaju vremenske, prostorne, jezične granice, one su vječne. Utkane u život, mišljenje i maštu mnogih civilizacija, one su političko i vojno oruđe u rukama država, artefakti nacionalnih ekspanzija, otkrića, trgovine. One su znanstveni dokument i umjetničko djelo u jednom (Harley i Woodward, 1987).

To ih čini tako posebnim i daje važnost u zbirkama muzeja, galerija, knjižnica. Zbirke ih projektima digitalizacije koji su započeli 90-ih godina 20. stoljeća žele učiniti dostupnim širokom krugu korisnika interneta različitih interesa.

Veliki projekti digitalizacije svjetske kulturne baštine, pa tako i karata odvijaju se u najvećim knjižnicama širom svijeta kao što su primjerice Kongresna knjižnica, nacionalne knjižnice Velike Britanije, Francuske, Nizozemske itd. Najvrijednija građa postaje dostupna svakom, u svakom trenutku bez obzira gdje se nalazio.



Fig. 1 Homann, Johann Baptist: *Tabula Ducatus Carnioliae Vindorum Marchiae et Histria. Norinergea, 171-* J. B. Homann, a well-known German cartographer and publisher, prepared the Map of Dukedom of Crain with Slovenian Mark and Istra according to the data of J. V. Valvasor. In the upper right corner is a view of Ljubljana, while the plan of Cerknica Lake is placed in the lower right corner

Slika 1. Homann, Johann Baptist: *Tabula Ducatus Carnioliae Vindorum Marchiae et Histria. Norinergea, 171-* Kartu Vojvodine Kranjske sa Slovenskom markom i Istrom je poznati njemački kartograf i izdavač J. B. Homann pripravio po podatcima J. V. Valvasora. U gornjem desnom kutu je veduta Ljubljane, u donjem sadržajno bogat plan Cerkniškog jezera.

Twenty-six hand-made maps by Petar Freiländer, dating approximately from 1520, are the oldest preserved cartographic work in Slovenia and in the Map and Pictorial Collection. The maps are copies of Ptolemy's maps. The fifth map of Europe represents ancient-world provinces of south-eastern parts of Europe, among others the Slovenian territory.

The 16th century is also the century of cosmographies, descriptions of the then known world, which are mostly combinations of history, geography, findings from natural sciences and imagination. Various editions of *Cosmographie* by Basel theologian, geographer and cartographer Sebastian Münster (Glavan et al., 2003) include two maps on which present-day Slovenian territory is presented. Better known is *Descriptio totius Illyridis*, a wood-engraving, oriented south as many medieval maps under the Arabian influence, strongly influenced by Ptolemy, and a less known untitled map oriented north and depicting real contours of Istria and present-day Slovenia in a more realistic manner.

Theatrum orbis terrarum, the first collection of the most important maps of that time, drawn by various authors, was printed by cartographer Abraham Ortelius in 1570 in Antwerp. Presentations of the Slovenian territory are also found on maps by Joannes Sambucus, Augustin Hirschvogel and Wolfgang Lazius. Gerard Mercator, the inventor of the Mercator map projection, published the Atlas late in the 16th century, and by doing so introduced the term atlas for a single volume containing a collection of maps. Unlike Ortelius, he himself is the author of the maps, and therefore also of the map *Karstia, Carnolia, Histria et Windorum Marchia*.

A map by Nicholas Sanson, a 17th century French court cartographer, *Duchés de Stirie, Carinthie, Carniole* represents a cartographically more complete representation of Slovenian territory, although influences of 16th century cartographers Sambucus, Hirschvogel and especially Lazius, are still evident. First authentic cartographic works by a Slovenian author, made and printed on Slovenian territory were designed in the 17th century.

26 rukopisnih karata koje su nastale oko 1520. godine autora Petra Freiländera je za sada najstarije kartografsko djelo u Sloveniji i u Kartografskoj i grafičkoj zbirci. Karte su redakcija Ptolemejevih karata. Peta karta Europe prikazuje antičke provincije jugoistočnog dijela Europe, između ostalog i slovenski prostor.

To je i stoljeće kozmografije, opisa tada poznatog svijeta, mješavine povijesti, geografije, prirodnopisa i mašte. U različitim izdanjima *Cosmographie* bazelskog teologa, geografa, kartografa Sebastiana Münstera (Glavan i dr., 2003) su i dvije karte s prikazom današnjeg slovenskog prostora. Poznatija je *Descriptio totius Illyridis*, u drvorezu, koja je kao mnoge srednjovjekovne karte pod arapskim utjecajem orijentirana prema jugu, sa snažnim utjecajem Ptolemeja, i manje znana karta bez naslova koja je orijentirana prema sjeveru i bliža realnim konturama Istre i današnje Slovenije.

Godine 1570. u Antwerpenu je tiskana prva zbirka najboljih karata tog razdoblja različitih autora, atlas *Theatrum orbis terrarum*, kartografa Abrahama Orteliusa. Doprinos prikazima slovenskog prostora dali su Joannes Sambucus, Augustin Hirschvogel i Wolfgang Lazius. Gerard Mercator, izumitelj Mercatorove kartografske projekcije, je krajem 16. stoljeća izdao Atlas i tako uveo pojam atlas, za u jedan volumen uvezanu zbirku karata. Za razliku od Ortelija on je sam autor karata, tako i karte *Karstia, Carniola, Histria et Windorum Marchia*.

Karta francuskog dvorskog kartografa 17. stoljeća Nicholasa Sansona *Duchés de Stirie, Carinthie, Carniole* predstavlja kartografsko dovršeniji prikaz slovenskog prostora iako su još uvijek vidljivi tragovi kartografa 16. stoljeća Sambucusa, Hirschvogela i posebno Laziusa.

U 17. stoljeću nastaju prva izvorna kartografska djela "slovenskog" autora izrađena i tiskana na slovenskom prostoru. To su karte Janeza Vajkarda Valvasora, polihistora i topografa koji je u svojoj grafičkoj radionici u gradu Bogenšperk izdao prvi opširan povijesno-topografski i etnografski opis Kranjske "Slava Vojvodine Kranjske" i 6 topografija među ostalima i "Topografija suvremene Vojvodine Kranjske". Njegove karte donose nove, pravilnije podatke koji su bili rezultat Valvasorovih vlastitih mjerenja i terenskih opažanja. Posebno su značajni njegovi detaljni opisi Cerkniškog jezera, koje je kao nerazjašnjen prirodni fenomen svojom dimenzijom iskakao na kartama Valvasorovih predhodnika. Valvasorov opis Cerkniškog jezera je u to vrijeme bio tako važan doprinos znanosti da mu je omogućio članstvo u prestižnom britanskom Royal Society.

Valvasorovo kartografsko djelo je bilo temelj za kartografe 18. stoljeća Weigla, Homanna, Seuttera koji su dodali popravke svojim prikazima slovenskog prostora. Bogastvo grafičkog izražaja na kartama 18. stoljeća dostiže vrhunac i tako ih svrstava u rang umjetničkih djela.

Pravo umjetničko djelo je velika karta *Ducatus Carnioliae* ... na 12 listova Janeza Dizme Florjančiča, izdana 1744. Florjančič je nakon putovanja po Kranjskoj koje je trajalo duže od 10 godina i detaljnih kartografskih mjerenja unio popravke u dotadašnje karte i izradio novu kartu, najprecizniju do tada, u mjerilu 1:100 000. Na karti

se nalazi i veduta Ljubljane, a ispod nje precizan i do tada prvi publicirani tloris grada u približnom mjerilu 1:5000 s popisom važnih ljubljanskih objekata (Glavan i dr., 2003).

U drugoj polovini 18. stoljeća istraživao je i opisivao Kranjsku Valvasorov nasljednik, prirodoslovac Baltazar Hacquet koji je u svom djelu *Oryctographia Carniolica* iznio prirodoslovni i mineraloški opis Kranjske. Na karti je u prvom dijelu knjige, koju je izradio Franc Ksaver Baraga, prvi puta prikazano rudno bogatstvo Kranjske.

U 19. stoljeću, u doba buđenja nacionalne svijesti europskih naroda, najveću pažnju zaslužuje *Zemljovid slovenske dežele in pokrajini* Petra Kozlera. Autor karte je bio izrazito nacionalno osviješten geograf, pravnik, političar i industrijalac koji je želio s kartom dokazati opravdanost nacionalnih težnji revolucionarnih Slovenaca u Beču ujedinjenih u program Zedinjena Slovenija (Longyka, 2000). Na karti je označen slovenski etnički prostor, granica do koje seže slovenska riječ, prvi puta je korišten pojam "slovenske dežele" i u potpunosti upotrebljeni slovenski toponimi. Zbog svega navedenog je karta, koja je objavljena 1853. godine bila zabranjena punih 8 godina.

Pilot projekt digitalizacije

Svi ti izuzetni kartografski primjerci su donedavno bili dostupni samo u čitaonici Kartografske i grafičke zbirke Narodne i univerzitetne knjižnice. S počecima i razvojem digitalne knjižnice krajem prošlog stoljeća zidovi knjižnica su nestali. Digitalizacijom se najdragocjenija građa svjetske kulturne baštine čini dostupnom bez vremenskih, prostornih, civilizacijskih i kulturoloških granica.

Kartografska i grafička zbirka Narodne i univerzitetne knjižnice i Geodetski institut Slovenije su s pilot projektom digitalizacije 20 najdragocjenijih karata slovenskog prostora pridonijeli izgradnji svjetske digitalne knjižnice.

Cilj digitalizacije je bio popularizirati vrijednu i rijetku građu te ju učiniti dostupnom korisnicima interneta. Ujedno smanjiti uporabu izvornika koji zbog velikih dimenzija često trpe mehanička oštećenja.

Izbor i opis karata je izveden u Kartografskoj i grafičkoj zbirci, a digitalizacija u Geodetskom institutu Slovenije.

Digitalni kartografski podaci dobiveni su na 3 načina:

1. fotografiranjem cijele karte ili djelova karte digitalnim fotoaparatom Olympus E10,
2. fotografiranjem cijele karte ili djelova karte klasičnim fotoaparatom Pentacon six/TL i skeniranjem dijapozitiva fotografiranih originala,
3. skeniranjem originala (Demšar i dr., 2002).

Pri fotografiranju digitalnim fotoaparatom cijele karte razmak je iznosio 1,60 m, a pri fotografiranju dijelova karte polovicu manje. S time se znatno povećao broj piksela. Programski paket za obradu karata bio je Adobe Photoshop 6.01. Obrada je bila zbog tonsko različitih originala zahtjevna.



Fig. 2 Precise description of the Cerknica Lake
Till J. V. Valvasor the Cerknica Lake presented unsolved phenomenon. Valvasor's description of the Cerknica Lake in that time was such a significant contribution to science that it enabled him to become a member of the prestigious British Royal Society.

Slika 2. Detaljan prikaz Cerknjškega jezera
Do J. V. Valvasora je Cerknjško jezero predstavljalo nerazriješen prirodni fenomen. Valvasorov opis Cerknjškega jezera je krajem 17. stoljeća bio tako važan doprinos znanosti da mu je omogućio članstvo u prestižnom britanskom Royal Society.

64

These are maps by Janez Vajkard Valvasor, a polyhistorian and a topographer who, in his print shop in Borjensperk, printed the first extensive historical-topographic and ethnographic description of the Dukedom of Crain "Die Ehre dess Herzogthums Crain" and six topographies, among others "Topographia Ducatus Carnioliae Moderna". His maps, although made on Mercator's, give new, present accurate outlines, which are the result of Valvasor's own measurements and field observations. Valvasor's description of the Cerknica Lake was such a significant contribution to science at that time that he became a member of the prestigious British Royal Society.

Cartographic work by Valvasor was the foundation for 18th century cartographers Weigl, Homann and Seutter, who added corrections to their presentations of the Slovenian territory. The richness of graphic expression reaches its climax in the maps of 18th century and places them within the sphere of art. The real work of art is the famous map *Ducatus Carnioliae...* on 12 sheets by Janez Dizma Florjančič, printed in 1744. It is a Slovenian cultural monument. After his journey across the Crain territory, which took him over 10 years, and detailed cartographic measurements, Florjančič made corrections to existing maps and made a new map, up to this point the most accurate, at the scale 1:100 000. On the map, there is also a view of Ljubljana, and under it an accurate, and by that time the first published ground plan of the city at the scale of approximately 1:5000 with a listing of important objects of Ljubljana. (Glavan et al., 2003).

In the second half of 18th century, exploring and describing the territory of Crain was taken over by Valvasor's heir, naturalist Baltazar Haquet who in his work

Oryctographia Carniolica, stressed the natural-scientific and mineralogical aspects of the description of the Crain territory. In the first part of the book, the map made by Franc Ksaver Baraga shows the mineral wealth of the Crain territory for the first time.

The map of Slovenian state and the provinces by Peter Kozler is undoubtedly the most interesting map of the 19th century, the period of uprise of time of national self-awareness of European nations. The author of this map was a very patriotic geographer, lawyer, politician and industrialist, and with his map he tried to prove that national aspirations of revolutionary Slovenians in Vienna belonging to the movement of United Slovenia were justified (Longyka, 2000). The map depicts Slovenian ethnical territory with boundaries extending to where Slovenian language was used, the term "Slovenian country", and toponyms used are Slovenian. The map, published in 1853, was prohibited for eight years as a consequence of the above mentioned facts.

Pilot digitisation project

All of these outstanding maps were until recently only accessible in the reading-room of the Map and Pictorial Collection. Library walls vanished with the beginnings and the development of digital library at the end of the past century. Digitisation makes the most precious materials accessible regardless of time, space or cultural boundaries.

The Map and Pictorial Collection of the National and University Library and the Geodetics Institute of Slovenia, have contributed to the construction of a world digital library with this pilot digitisation project of the 20 most precious maps of Slovenian territory.

The goal of digitisation was to make valuable and rare materials popular and to make them accessible to Internet users, and, last but not the least, to reduce the use of originals, which are, because of large formats, often prone to mechanical damage.

Selection and description of maps was carried out at the Map and Pictorial Collection, and the digitisation at the Geodetics Institute of Slovenia.

Cartographic data for digitisation were sampled using three methods:

1. taking of photograph of the whole map or parts of a map with a digital camera Olympus E10
2. taking a photograph of the whole map or parts of a map with a classic camera Pentacon six/TI and scanning the slides of originals
3. scanning of the originals (Demšar et al., 2002).

When photographing the whole map with a digital camera, the map was placed 1.60 m from the objective. When photographing parts of the map, the distance was reduced by half. Adobe Photoshop 6.01 was the software used for the processing of maps.



Fig. 3 Zooming into the map Tabula Ducatus Carnioliae ..., by J. B. Homann enabled by using MrSID format

Slika 3. Detaljan pogled u isječak karte Tabula Ducatus Carnioliae ..., J. B. Homanna koji omogućava format MrSID

Kvaliteta snimaka je bila različita ovisno o veličini originala. Slika je bila kvalitetnija što je original bio manji. Takav način digitalizacije je primjeren za pregledni i ikonski prikaz karata na internetu, ne i za detaljniji prikaz sa zumiranjem (Demšar i dr., 2002).

Fotografiranje klasičnim fotoaparatom se obavljalo istovremeno s digitalnim. Rezultat skeniranih dijapozitiva bio je sličan digitalnoj fotografiji tako da u praksi nisu bili korišteni.

Skeniranje je bilo izvedeno sa ravnim skenerom Saphir Ultra Linotype-hell formata A4 s 300 dpi. Svi skenogrami su izrađeni u CMYK-u (zapis u boji rasterskih slika za tisak) sa 32-bitnom dubinom boja. Zbog veličine original bilo je potrebno većinu karata skenirati po dijelovima, koji su se morali prekrivati na rubovima. Dijelovi su s programom Photoshop 6 spojeni u cjelinu i tonsko i geometrično usklađeni. Veličina slika je u rasponu od 160 do 350 MB. Prvobitni zapis slika je u formatu TIFF-8. Sve rasterske slike su spremljene u RGB model boja (Demšar i dr., 2002).

References / Literatura

- Demšar, J., Radovan, D., Janežič, M., Petrovič, D. (2002): Izdelava internetnega kataloga starih kart Narodne in univerzitetne knjižnice v Ljubljani. Geodetski institut Slovenije, Ljubljana.
- Glavan, M., Rupert, M., Šolar, R., Loparnik, B. (2003): Zakladi Narodne in univerzitetne knjižnice v Ljubljani. Narodna in univerzitetna knjižnica, Ljubljana.
- Harley, J. B., Woodward, D. (1987): The history of cartography. Vol. 1, Cartography in prehistoric, ancient, and medieval Europe and the Mediterranean. The University of Chicago Press, Chicago, London.
- Longyka, I. (2002): Prikazi slovenskega ozemlja. Ilustrirana zgodovina Slovencev, 443-483
- Šolar, R., Radovan, D. (2003): Hyperlinked promenade through the historical geolocation, toponymy, and appearance of Slovenian towns. Poster presented at the 20th International Conference on the History of Cartography, Harvard University, University of Southern Maine.
- Zbirka zemljevidov slovenskega ozemlja, (9. 2. 2004)
<http://www.nuk.uni-lj.si/zbirkazemljevidov/>

Zbog velike količine podataka skeniranih karata, vremenski zahtjevnog prenošenja i otvaranja tako obimnih datoteka, karte su komprimirane u format MrSid, koji omogućava fleksibilno korištenje na internetu. Za detaljan pregled karte u formatu MrSid potrebna je instalacija programa Lizardtech ExpressView. Izrađena je aplikacija za prijenos u internetni oblik. Karte su javno dostupne na web stranici knjižnice <http://www.nuk.uni-lj.si/zbirkazemljevidov/>.

Obavljeni testovi različitih postupaka digitalizacije starih karata ukazuju, da je tehnologija postupka pravilno izabrana, što je potvrđeno i u stručnoj literaturi.

Zaključak

Digitalizacija karata je sastavni dio digitalizacijskih projekata knjižnica, muzeja, arhiva koje žele svoju vrijednu i traženu građu učiniti dostupnom na internetu. Karte su posebno zanimljive zbog svoje univerzalnosti. Veliki projekti digitalizacije karata odvijaju se u nacionalnim knjižnicama širom svijeta na sličan način kao što je opisano u ovom članku.

Osim multimedijske upotrebe samih karata moguća je i njihova kombinacija i komparacija sa suvremenim kartama i digitalnim bazama kao što je digitalni model reljefa, toponimi, topografske karte i planovi gradova različitih mjerila, panoramski i aerosnimci te 3D modeli gradskih jezgri. Ujedno mogu poslužiti kao osnova za istraživanja o promjeni lokacije u određenom vremenskom razdoblju za potrebe geografije, povijesti, u genealoškim istraživanjima, u turističkoj promociji i za obrazovanje (Šolar i Radovan, 2003).

S pilot projektom internetnog dostupa do 20 karata slovenskog prostora postavljena je i osnova za daljnju digitalizaciju vrijedne i rijetke kartografske građe te uključivanja drugih slovenskih kulturnih javnih ustanova u cjeloviti prikaz starog slovenskog kartografskog fonda.

The quality of photographs varied, depending on the size of the original. The smaller the original, the higher the quality was. The mode of digitisation is appropriate for overall and icon displays of maps on the Internet, but not for a detailed display with zooming options (Demšar et al., 2002).

Photographs were also taken with a classical camera and slides were scanned. The quality of the scans was the same as the quality of digital photographs. This method was not used later.

Scanning was performed using Saphir Ultra Linotypehell, a flat-bed scanner on A4 format with 300 dpi. All the scanograms were made in CMYK (recording in colour of screen photographs for print) with a 32-bit colour depth. Due to the size of the original, most maps had to be scanned in several parts with overlapping borders. The parts were joined together using Photoshop 6, and harmonized as to tint and geometry. The size of photographs ranges from 160 to 350 MB. The primary format of the photographs is TIFF-8. All the screen photographs have been converted to RGB color model (Demšar et al., 2002).

Due to the quantity of data on scanned maps, and their time-consuming transfer and opening, the maps have been compressed into MrSid format, which enables flexible Internet usage. The installation of the Lizardtech ExpressView program is required for a detailed inspection of a map in MrSid format. The application that prepares data for the Internet is created. Maps are publicly available at the web-pages of the library, <http://www.nuk.uni-lj.si/zbirkazemljevidov/>.

Performed tests of the various procedures on old map digitisation shows that the appropriate technology was chosen which is also approved in professional papers.

Conclusion

Digitisation of maps is a part of digitisation projects taking place in libraries, museums, archives, which aim at making their valuable and sought-after materials accessible over the Internet. Maps are especially interesting because of their universality. Great map digitisation projects take place in national libraries throughout the world.

Beside multimedia presentations of historic maps, their combination and comparison with contemporary maps and digital bases such as digital terrain model, toponymy, topographic maps and city plans of various scales, panoramic and aero views and 3D models of city centres are possible. They are useful tools for location researches in geography, history, genealogy, and important for tourism and education (Šolar and Radovan, 2003).

This pilot project of digitisation of 20 maps of Slovenian territory accessible over the Internet represents the basis for further digitisation of valuable and rare cartographic materials and for the inclusion of other Slovenian cultural public institutions into a comprehensive presentation of ancient Slovenian cartographic collections.

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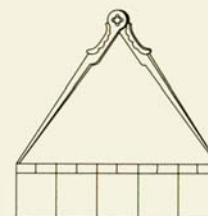
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