

PHOTOGRAMMETRY IN SLOVENIA - REGIONAL ORGANIZATION, COOPERATION AND EDUCATION

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Commission VI, Working Group 3

KEY WORDS: photogrammetry, education, Slovenia

ABSTRACT:

Slovenia is one of the youngest and one of the smallest of the European countries. In 1991 became an independent republic. Political and economical changes in Slovenia reflected in all its parts, and photogrammetry is no exception. In the paper the authors give their point of view of the current (non satisfactory) situation of Slovenian photogrammetry in a very hard market competition. They believe that Slovenian geodetic and photogrammetric society must become aware that competition is good but with cooperation everybody will profit. International cooperation is motivation for Slovenian photogrammetrists to overcome their internal problems of communication and cooperation.

1. INTRODUCTION

Slovenia is one of the youngest and one of the smallest of the European countries. With two million inhabitants, she has only a third the population of Denmark and is half the size of Switzerland. But her position is all that could be desired. Situated along the foothills of the eastern end of the chain of Alps, at the very tip of the most northerly Mediterranean bay, open towards Hungary and the south, it is a natural hub of European routes from north to south and west to east.

In 1991 Slovenia became an independent republic with democratic political system (a parliamentary form and market-oriented economy). Political and economical changes in Slovenia influenced the way of living and working on all levels (from national to private). This changes reflected also in current situation in Slovenian photogrammetry. We wonder if we could answer a rhetorical question: "Is the situation in Slovenian photogrammetry an example or an exception in newly formed countries?"

2. PHOTOGRAMMETRIC INSTITUTIONS, ORGANIZATIONS AND PROJECTS

2.1 Institutions and organizations

In Slovenia the following institutions and firms represent and serve the photogrammetry and remote sensing.

Governmental institutions:

Ministry of Environment and Physical Planning- Surveying and Mapping Authority of the Republic of Slovenia,
Office for Statistics of the Republic of Slovenia (only remote sensing).

Educational institutions:

University of Ljubljana - Faculty of Civil Engineering and Geodesy is the head of the photogrammetry and remote sensing education.

Photogrammetry and remote sensing is teaching in some courses also in Biotechnical Faculty - Department of Forestry and Faculty of Arts - Department of Archaeology.

Governmental institutes:

Institute of Geodesy and Photogrammetry at the Faculty of Civil Engineering and Geodesy,
Centre for Scientific Research of the Slovenian Academy of Science and Arts.

Private firms:

Geodetic Institute of Slovenia and some other smaller firms.

A section on photogrammetry and remote sensing is formally existing in a framework of Association of Slovenian Surveyors but it has not been active for the last four years.

In the field of photogrammetry and remote sensing only 45 people (from experts to operators) are actively employed so specialization in only one subject is not realistic.

2.2 Researches and Projects

Developmental and research projects are mostly financed by Surveying and Mapping Authority of the Republic of Slovenia. The basic project which is recently going on is definition of "Strategy of topographical-cartographic system of the Republic of Slovenia" which is not finished yet. Final definition of strategy will certainly influence also the future photogrammetric projects.

To explain and understand the greatest problems of Slovenian photogrammetry today which are lack of professional staff and mostly old (analog) equipment we must first look back. In 1955 Slovenia started with topographical map compilation on analog photogrammetric instruments in scale 1 : 5.000 (urban and important areas) and 1 : 10.000 (Alpine and mountains regions) and in the next two decades the entire Slovenian territory was covered by maps of these two scales (all together 2800 sheets). What a treasure of data! This was really a gold era of Slovenian photogrammetry. But, when in years of seventies and eighties

the analytical instruments became the "riding horse" of photogrammetric production there was no investment in new equipment in Slovenia. From early eighties the most of geodetic budget have been spent for establishment of digital land cadastre. Photogrammetry lost the importance and there was less and less interest among students to work on old analog instruments. With independence of Slovenia came to privatization process and everybody was put in the market competition, and the circle was closed. The state had no interest more to invest in new equipment. Fortunately, the institutions which were traditionally involved in photogrammetry, namely Geodetic Institute of Slovenia and Institute of Geodesy and Photogrammetry bought some modern equipment (all together one digital photogrammetric station and two analytical instruments).

However, the Surveying and Mapping Authority of the Republic of Slovenia made some steps forward to get digital data of the existing maps. All the maps in scales 1 : 5.000, 1 : 10.000 and 1 : 25.000 were scanned in order to get raster data for GIS or for vectorisation. Some layers of all the maps in scale 1 : 25.000 (201 sheets) are vectorised and data are organized in so called generalized cartographic database. But only 100 sheets in scale 1 : 5000 are vectorised because the goals of database and it's maintenance are not defined yet. The greatest obstacle of all these projects is maintenance of maps and databases. Maps are still maintained in an analog way because the state instructions and ordinance are suited for analog production only (with the exception of digital orthophoto maps).

Further on, the Surveying and Mapping Authority finances aerial survey of the entire territory of Slovenia in three years cycle in photographs scale 1 : 17.500. These photographs are used for maintenance of analog maps in scale 1 : 5000 and digital orthophoto maps production in the same scale. Around 450 sheets were produced till now. Further on, 110 orthophoto mapsheets at scale 1 : 1000 for coastal zone were produced as well.

3. STUDYING PHOTOGRAMMETRY IN SLOVENIA

3.1 Short history of studying photogrammetry

University in Ljubljana was established in 1919. Since then photogrammetry has always been part of geodetic department. In between 1919 and 1928 study of geodesy was organised as two years course. In 1928 four years study was organised which was in year 1931 cancelled because of economic crises. In those years photogrammetry was one of expert courses. Forty-five students have finished this study.

Studying photogrammetry in a period after the Second World War we are going to see through 10 year cycles. In 1945/46 the duration of geodesy was four 4 year's study where photogrammetry was lectured for three years. Similar time table was in 1955/56 except that photography was added as selective article. In 1965/66 photogrammetry was lectured two years, same as in year 1975/76 when one could choose non-topographic photogrammetry as selective article. In year 1985/86 photogrammetry was lectured in second, third year and in forth as numerical photogrammetry. In the eighties, remote sensing with photointerpretation has started in forth year.

3.2 Present situation

In Slovenia the photogrammetry is possible to study only at Geodetic Department, Faculty of Civil and Geodetic Engineering (FGG), University of Ljubljana (UL). In school year 1996/97 new study program started: University Study (US) has 9 semesters and High Technical Study (HTS) has 5 semesters. In last study year US and HTS are split in two orientation to choose: Surveying and Spatial, Engineering surveying and Geoinformatics respectively. Each study finishes with one year for the diploma work.

3.2.1 Lecture and Exercise hours

Number of lecture and exercise hours has not changed much through last two decades. On Table 1 is presented numbers of lecturing and exercising hours at present situation.

	I. year	II. year	III. year	IV. year
Photogramm.	L/E	L/E	L/E	L/E
University Study	/	60+45 = 105	45+45 = 90	30+30 = 60
High Tech. Study	/	30+45 = 75		
Remote Sensing	L/E	L/E	L/E	L/E
University Study	/			30+30 = 60
High Tech. Study	/		30+15 = 45	

Table 1.: Lecture and exercise hours for US and HTS studying Photogrammetry and Remote Sensing

3.2.2 Staff problem

At the Department of Geodesy there are four sections and one of them is for Photogrammetry and Cartography. Five different level of lecturer are distinguished, from assistant to professor A. If considered last 12 years and only regular employed staff, a professor A has never be employed and the last 3 years only 1 professors B and last 2 years nobody else. At present nobody is fully employed at that section. Six external lecturers are teaching now photogrammetry: two are from University of Zagreb (one professor and his assistant), one lecturer is retired and three of them are from two production organisations (two from Institute of Geodesy and Photogrammetry and one from Geodetic Institute of Slovenia). Unfortunately no improvements are seen in the near future in that problem area.

3.2.3 Students

Number of students is growing. For US, in school year 1979/80 91 students were studying at the department and this year 151, but number of graduated descents: in 1979/80 20 and last year 6 graduated. For HTS the numbers are 56/135 and 31/16 respectively. Big problem is for students to finish the first year where less then 40% students go to the second year. Later the cast off is very little.

3.2.4 Equipment

Instruments are old and very few: Multiplex, Dicometer, Topocart (ZEISS) and B8 (Wild). Software available are ORIENT, SCOP, VSD (Video Stereo Digitiser) and in-house

written. For linking photogrammetry with GIS the following SW is available: PC Arc/INFO, MGE and Idrisi. Fortunately students can perform exercise at Institute of Geodesy and Photogrammetry on analogue instrument Topocart (ZEISS), analytical instrument (ADAM - PROMAP), DMS and AutoCAD and at Geodetic Institute of Slovenia where 5 analogue instruments are installed (Wild 2xA8, A7, A10 and B8) and one analytical (Leica - SD2000) connected to VI-KORK mapping system, digital scanning workstation DSW100 and digital photogrammetric workstation DPW770 are available, but only when are not used in the production.

3.3 TEMPUS project (SJEP)

The aim of the project is to improve education on environment and infrastructure for geodetic professionals on the high technical and university level of the Geodetic Department FGG. The analysis of present study system, programs, specialisation, number and structure of students are considered to serve improve the education. In addition conclusions are presented which have been gathered during programme of visits in a various geodetic institutions, organisations and companies in Slovenia. We hope that some above mentioned problems will be solved through TEMPUS project.

4. COOPERATION

Projects are mostly financed from budget by Surveying and Mapping Authority of the Republic of Slovenia. Hard competition in market-oriented economy caused that each institution and firm must compete for projects. Also formal governmental institution (e.g. Institute of Geodesy and Photogrammetry) are almost completely put into the market. Development and researches, production lines, new technologies etc. are for these reasons "secret" because each firm wants to have better position in the market. However, it is our firm opinion that not everything could be put into the market, e.g. projects of national importance, education, Perhaps the biggest problem is that in the photogrammetric field we do not have an independent professional authority for national-level decisions. Surveying and Mapping Authority of the Republic of Slovenia does not have enough team (actually only one person is adequately involved in photogrammetry), in the Faculty of Civil Engineering and Geodesy there is also not enough staff, Institute of Geodesy and Photogrammetry is only formally governmental institution, etc.

The authors of this paper initiated the idea of reviving the Photogrammetric Section of Association of Slovenian Surveyors in order to overcome the above described situation. They prepared a program of the Section which was submitted to the Association and will be discussed on it's annual assembly (planned in spring 97) and for which they hope that could be realized in one year. In the framework of the Section, cooperation of different institutions and firms, national and private interest could be started. The authors of the paper believe that competition is good but cooperation is better (what is also one of the ideas of WG VI/3).

Shortly, the program include:

- promotion of photogrammetry in Slovenia (papers in magazines, demonstration of results, ...)
- support in education process (equipment, practical works for students,...)
- professional lectures (invited experts from abroad,...)
- active participation of photogrammetrists on traditional "Geodetic days" in Slovenia

- international cooperation and technology transfer (in the framework of WG VI/3)
- and other activities

5. CONCLUSION

The Terms of Reference of the WG VI/3 are close to our ideas and needs. What we mostly need are not sophisticated theories and top-researches, but in everyday life we need practical, fast and effective solutions. We need to exchange experiences especially on the national level where the strategic decisions (i.e. investments in equipment, technical solutions, etc.) are crucial for our future. International cooperation is motivation for Slovenian photogrammetrists to overcome internal problems of communication and cooperation. But we are aware that, however, realising this ideas will be a long-term process.

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