Development of Market of Geodetic Services and Geodetic Companies in the Republic of Serbia

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Key words: Development of geodetic services market, partnership, private and public sector

SUMMARY

Social and political changes that took place in the year 2000 in Serbia had positive effects on the development and liberalization of the geodetic services market. The change of legislative framework regulating the geodetic field gave boost to the private initiative and restructuring of geodetic specialists, transferring from public to private sector. Through separation of authorities, a partnership relation was established between the national geodetic authority and the private geodetic organizations providing both with clearly divided jurisdictions. The World Bank loan aimed at establishment and modernization of real estate cadastre and other donor and investment projects directly supported the above described development trend in Serbia.

This paper gives an outline of the existing situation regarding the development of market of geodetic services in the Republic of Serbia since year 2000, and in particular provides the analysis of the development of private geodetic companies following the newly introduced changes in the country.

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1. BACKGROUND

The earliest documents containing the land records in the territory of the Republic of Serbia date back to the period of medieval Serbian state. These documents are actually the monasteries' charters that don't contain numerical data, but contain the descriptive information pertaining to the legal property relations and ownership of the land (source: Geodetic Profession in Serbia 1837 – 1947 – 1987). The period of the 20th century in the Balkans was marked by turbulent periods, creation and establishment of new countries, change of social systems etc, which undoubtedly left consequences on the organization and establishment of a single stable model of organization of geodetic profession from the aspect of private and public sector. At the same time, the development of new technologies, the needs of the society and the wider social community have repeatedly put new requirements before the geodetic professionals.

Enacted Law on State Survey and Cadastre and Registration of Property Rights in 1992 created the preconditions for centralization of geodetic service in Serbia. The Law defined that administrative jobs related to the surveying and the creation of the real estate and line cadastre, their maintenance and renewal, and the registration of rights on real estate are implemented by one single agency called Republic Geodetic Authority (RGA). At that moment, a unification of the Republic geodetic administration, Regional geodetic administration, Geodetic administration of the city of Belgrade and the Municipal geodetic administrations into one single agency was done.

The difficulties in the functioning of the newly established geodetic authority were noted at the very beginning of its functioning. The organizational model that was created was such that had put all the technical and administrative works pertaining to establishment and maintenance of survey and real estate and line cadastre under strict jurisdiction of the Republic Geodetic Authority. The public geodetic companies, existing at that period, were mainly left with performing the works in special cases (geodetic works in engineering-technical domains) that were, due to the lack of investments, brought down to the bare minimum.

The social and political changes that took place in the Republic of Serbia in the year 2000 directly influenced the development and restructuring of the geodetic profession. The full centralization and concentration of the geodetic profession into one single national agency, the Republic Geodetic Authority, became unsustainable, especially with the further deterioration of the public geodetic companies, that due to the isolation at the time and the lack of investments were left out of business. The need for transformation of the public capital into other forms such as the private, governmental, shared, etc. made a significant influence on pursuit and creation of new legislative frameworks enabling better restructuring of

geodetic subjects in the country, so that their efficiency and effectiveness could be fully expressed.

Direct foundations for transformation and restructuring of the geodetic profession were laid with the adoption of the Law on Amendments and Supplements of the Law on State Survey and Cadastre and Registration of Property Rights in May 2000, which defined the legislative framework for development of private geodetic practice and the scope of their activities. Liberalization of the market of geodetic services was done and the geodetic works execution was transferred directly to the private geodetic companies, establishing favorable base for development of private entrepreneurship in Serbia.

2. ORGANIZATION OF GEODETIC SUBJECTS IN THE REPUBLIC OF SERBIA

With the passing of the Law on Amendments and Supplements of the Law on State Survey and Cadastre and Registration of Property Rights, the administrative tasks related to state survey, land cadastre, real estate cadastre, line (conduit, utility) cadastre and registration of real property rights, their maintenance and renovation, as well as other assignments were put directly under the scope of works of the Republic Geodetic Authority.

Republic Geodetic Authority is in charge of keeping and maintaining of all factual and legal data about the real property, but according to the provisions of the mentioned Law, all geodetic work in the field (surveying, subdivision and amalgamation of cadastral parcels, line network,etc.) are being performed by private geodetic surveyors and organizations. Geodetic organizations must be registered to perform geodetic works in the manner and under conditions defined by the Decree on the preconditions for operation of geodetic organizations (*Official Gazette of the Republic of Serbia, no 39/2002*) which provides detailed description of work requirements for such organizations (companies).

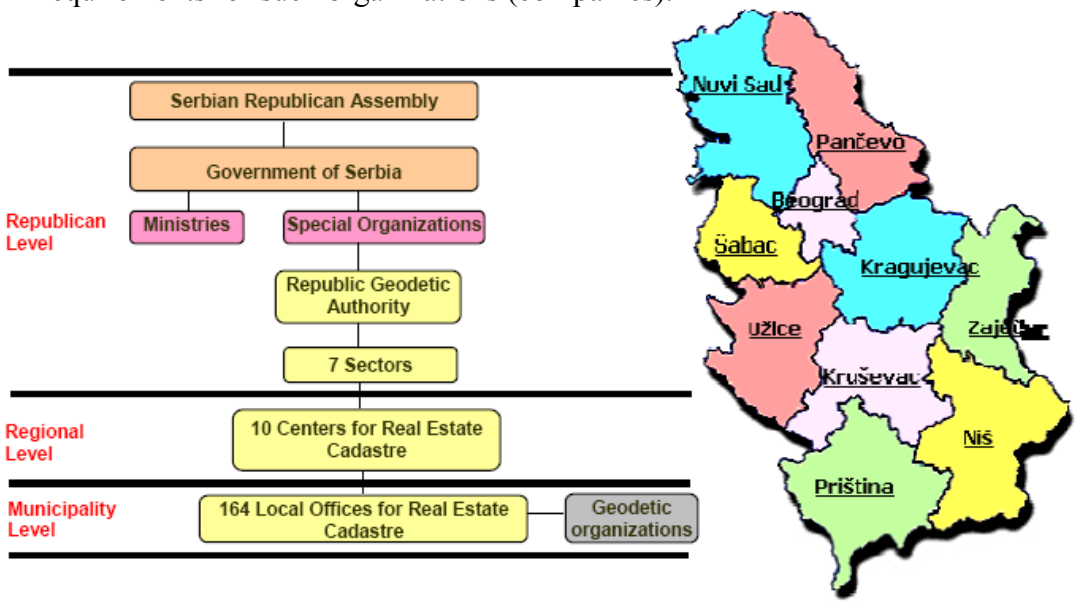


Fig 1. Scheme of organizational structure of geodetic subjects in the Republic of Serbia

2.1. Republic Geodetic Authority as an individual organization

Pursuant to the Law on Ministries (*Official Gazette of the Republic of Serbia 65/2008*), the Republic Geodetic Authority as an organization of special interest to the Republic of Serbia (*Fig 1*), is put in charge of the following activities:

- State survey, real estate cadastre and registration of property rights, their updating and maintenance;
- Technical documentation development;
- Basic geodetic works (works that include: creation of the project, determination and maintenance of astronomical-geodetic, trigonometric, leveling and gravimetric network, processing of measurements implemented for these networks and the determination of permanent geodetic points through the methods of global positioning);
- Production of the Basic National Map-BNM;
- Maintenance of the Register of Spatial Units – RSU
- Designation of house numbers, numeration of buildings and marking out of quarter, street and square names;
- Maintenance of register of house numbers, streets and squares;
- Cadastral land classification and land evaluation;
- Stipulation of cadastral income;
- Land development through land consolidation;
- Connection of geodetic networks and exchange of geodetic and cartographic data with the neighboring countries;
- Establishing of a geodetic information system;
- Management of the Archive of the state survey technical documentation, plans and maps;
- Technical supervision;
- Normative activities;

2.1.1. Organization of the Republic Geodetic Authority - RGA

Republic Geodetic Authority has the headquarters located in Belgrade, with organizational units – Real Estate Cadastre Centers located throughout major cities in Serbia and Real Estate Cadastre Local Offices located in Serbian municipalities.

Following organization units function within the headquarters of the Authority:

- Sector for Basic Geodetic Works
- Sector for Technical and Administrative Supervision
- Sector for Real Estate Cadastre
- Sector for Real Estate Survey
- Sector for Information and Communication Technology
- Sector for Legal Issues
- Finance Sector

At the regional level, there are ten regional Centers for Real Estate Cadastre (*Fig1*) within the Sector for Real Estate Cadastre. The centers are: Sabac, Beograd, Nis, Novi Sad, Kragujevac, Krusevac, Zajecar, Pancevo, Uzice, Pristina.

Each Real Estate Cadastre Center is comprised of Local Offices for Real Estate Cadastre (Municipality level). There are in total 164 Local Offices for Real Estate Cadastre in towns that serve at the same time as the headquarters for political municipalities. At the level of the entire Republic Geodetic Authority, there are approximately 2600 employees in total.

Republic Geodetic Authority is directly reporting to the Prime Minister, but the Ministry of Environment and Spatial Planning in Government of Republic of Serbia supervises the Republic Geodetic Authority in its engagement in practice in engineering and technical fields, and it coordinates policies, while the Government of the Republic of Serbia appoints the General Director of Republic Geodetic Authority.

2.2. Geodetic Companies

Following the amendments of the Law in 2002, the Decree on the preconditions for operation of Geodetic Organizations was passed, providing detailed directives for rules of operation, scope of activities and other details relevant for the establishment of new geodetic companies in the territory of the Republic of Serbia (Fig1). The Decree is divided into 5 Chapters, as follows:

- Introduction provisions;
- Description of technical works to be performed by a geodetic organization;
- Work requirements for geodetic organization as defined by the Decree;
- Functioning of a geodetic organization;
- Technical and professional supervision controlling whether the geodetic organizations operate in accordance with the Law.

2.2.1. Description of technical works that can be performed by a geodetic company

Geodetic companies (organization) has to be registered in the Serbian Business Register (for companies and entrepreneurs), as well as, in the appropriate Register of geodetic organizations for whose keeping and maintenance the Republic Geodetic Authority is in charge. An organization must have adequate professional staff with relevant work experience, relevant facilities and equipment at its disposal, etc. Thus the works that a geodetic company can be registered to perform on the territory of Serbia are divided into four categories, as follows:

1. Competent proceeding for which are needed the formation of the main (detail) project;
2. Creation (development) of technical documentation;
3. Technical works pertaining to maintenance of survey, real estate cadastre, land cadastre and line cadastre;
4. Geodetic works for special purposes (Creation of topographic plans for the needs of urban and other planning and designing; Geodetic works in engineering-technical domains).

To be allowed to perform the competent proceeding for which are needed the formation of the main project is foreseen, a geodetic organization needs to have at least three employees of geodetic profession with passed exam for the employees in department of state administration, from whom at least one is with higher education, as well as appropriate geodetic instruments and equipment.

A geodetic company registered for development of technical documentation (works listed under paragraph 2. above) should have at least two employees of geodetic profession with university degree in geodesy and passed exam for the employees in department of state administration, with working experience of at least three years on that kind of jobs and with permission for projection. Also it comprises appropriate geodetic equipment.

Technical works pertaining to maintenance of survey, real estate cadastre and land and utilities cadastre, designated with item 3 above can be performed by a geodetic company a that have at least one employee of geodetic profession with passed exam for the employees in department of state administration and who has at least three years of practical experience on such works, as well as appropriate geodetic instruments and equipment. The mentioned technical works include the following:

- monitoring and defining the changes in real estate properties that are of influence to the survey and real estate cadastre data;
- transferring to the field the data from urban planning projects and other planning documents and projects;
- collection and processing of data on the changes that occurred due to installation of new or reconstruction and closing down of existing utilities;
- maintaining the cadastral data in accordance with clients' requests, when renewal of property boundaries is required or identification of cadastral parcel and renewal (demarcation of utility lines).

Creation of topographic maps for the needs of urban and other planning and designing, in accordance with the existing division, falls under the group of geodetic works for special purposes, designated under no 4 above. For performing this kind of work, geodetic company needs to have at least one employee of geodetic profession with passed exam for the employees in department of state administration. The appropriate geodetic equipment is also required.

It is possible that an organization can perform only some of above mentioned scope of works if there is no condition for performing all of them. The Republic Geodetic Authority, on the bases of submitted application and relevant evidence, establishes whether the predefined conditions for operation of a geodetic company have been met and accordingly passes a Resolution on the compliance with the requirements for performance of one or multiple types of technical works, i.e. rejects the application and passes the resolution claiming that the geodetic company fails to meet the proscribed requirements. In case of positive decision, the resolution will list the names of individuals employed by the geodetic company in question. They will be issued working licenses for performance of geodetic works by the Republic

Geodetic Authority, thus making them legally certified for performance of technical geodetic works. The supervision over their work will be done by the Republic Geodetic Authority.

The geodetic company is obliged to report to the Republic Geodetic Authority all the relevant changes that can influence its compliance with the working requirements, i.e. the requirements of specific technical works for performance of which the company is registered. Otherwise, the RGA will pass a resolution on cancellation of the license allowing the performance of technical geodetic works, i.e. will financially penalize the geodetic company, in accordance with the provisions of the Regulation.

3. ANALYSIS OF THE DEVELOPMENT OF THE GEODETIC COMPANIES

The period between year 2000 and 2008 is a relatively short period for studying and analyzing a specific social phenomenon occurring due to the changes in the social environment and systematic legislative solutions that allow development and prosperity of private geodetic practice in Serbia. However, the experiment that was conducted in the form of a research poll and processing of thus obtained data confirm that the said 8-year period is not so short and that reliable parameters and assessments can be drawn on the global and individual effects of the said changes.

Before year 2000, in Serbia existed around 92 geodetic organizations, having the relevant working licenses issued by the Republic Geodetic Authority and employing around 500 geodetic experts. However, the right over the performance of geodetic works was mainly related to the works of creation of topographic and urban planning maps and works for special purposes. Those geodetic organizations were mainly offices and services within the large national or public companies that had geodetic works not as the primary but rather the secondary function. Today, in year 2008, the number of companies revolves around 740, employing around 2000 geodetic professionals. There are still some geodetic organizations that haven't implemented the changes in the ownership structure (public companies), as well as certain bureaus and offices that function within the public companies and that number revolves around 110. Some estimates say that in the above period around 630 completely new geodetic companies were established, mainly with private ownership, employing around 1500 specialists who were the target group of this research poll.

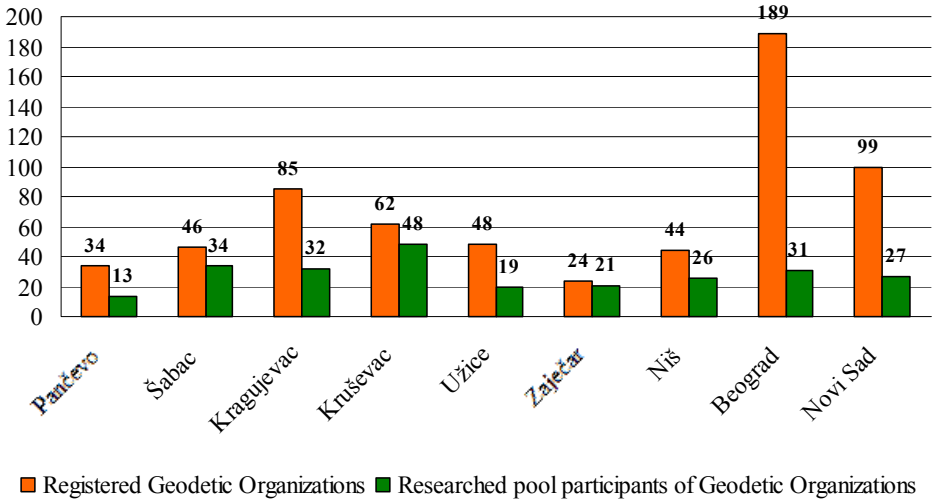
3.1. Description of the experiment and the analysis of the results

In the period June-September 2008, a research poll on the development of geodetic companies in Serbia was conducted. The main method used for collection of data for the analysis in this paper was the research poll conducted by a graduate student of the Faculty of Civil Engineering, Department of Geodesy and Geoinformation. The research poll contained 19 questions with multiple answers, but it was stipulated to the participants in the Research pool be mark only one answer for each question. The research pool covered the following topics:

1. organizational structure – legal and ownership status,
2. number of employees,
3. technical equipment available,

4. professional education of staff,
5. growth of the capital of the company and other parameters.

At the moment the total number of registered geodetic organization in the Republic of Serbia is 631 (private sector). Each company is possessing the relevant Resolutions on the compliance with the requirements for performance of geodetic works issued by the Republic Geodetic Authority. Out of the total number, 251 geodetic companies took part in the research poll, i.e. 39.78%, which represents a relatively high percentage and enables drawing proper conclusions. The headquarters of participating companies are evenly distributed throughout Serbia, as illustrated in *Graph 1*. General conclusion made is that the answers to certain questions were similar throughout the entire territory of the Republic of Serbia. In the areas where the results were drastically different from the average value, extreme cases were studied. Those extreme cases were noticed primarily in areas where the answers were predominantly influenced by the uneven economic growth of that certain region.



Graph 1: Overview of the total number of registered companies and companies that participated in the research poll on the territory of the Republic of Serbia per regional centers for real estate cadastre

Further on in the paper shall be presented some of the pool questions and the results to which the authors came to.

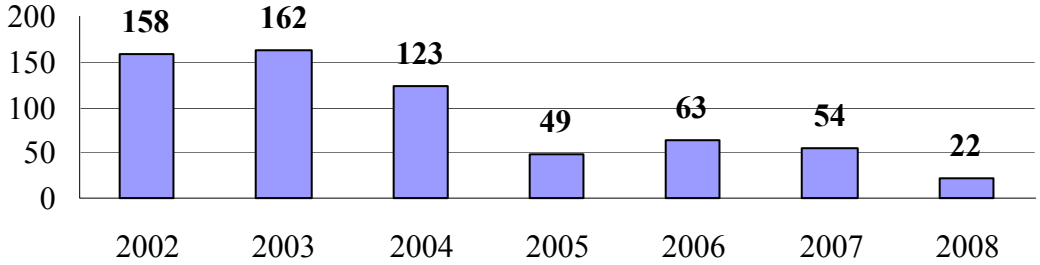
A) Poll question: **What type of geodetic organization do you have registered?**
1. Geodetic company (Stakeholder geodetic company, Limited liability company, Public company, etc.)
2. Private person's (geodetic) company – Entrepreneur.

Out of the total number of geodetic organizations, 21% are registered as geodetic companies, while 79% are registered as entrepreneurs. Answer to this question creates a completely different image if the region of the City Center of Belgrade is analyzed, where the ratio is 58% (companies) to 42% (entrepreneurs) compared to the region of the town center of Zajecar or Kragujevac where the ratio is 3% (companies) to 97% (entrepreneurs). Uneven economic development influences directly the status of the registered organization because it

is directly correlated with the level of work, number of employees, payment of tax and other fees to the government.

B) Poll question: **When the company was founded?**

Results are shown in *Graph 2.*, with clear view of the positive trend of the newly created economic and market environment. Transformation of resources from governmental and public subjects to newly formed private geodetic organizations was done relatively quickly and successfully.



Graph 2 : Overview of the number of registered geodetic companies per the year of founding

C) Poll question: **Give an assessment of the market of geodetic services;** following answers were available:

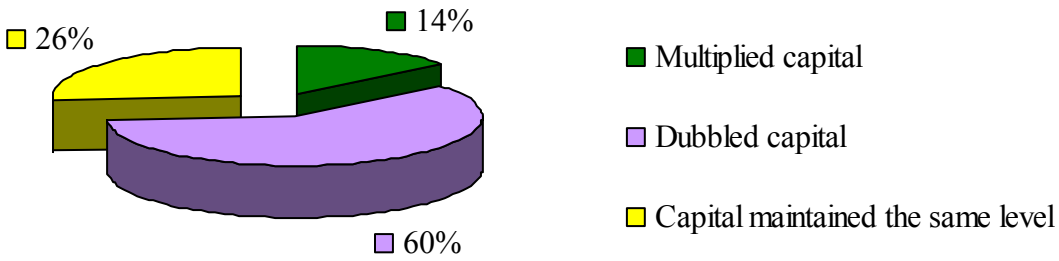
a) Extremely profitable and cost effective
b) Good, enables growth and development of the company
c) Satisfactory – covering the expenses and maintaining the achieved level of company development
d) Poor – low labor cost and high competition
e) Extremely poor and unprofitable.

The results are such that almost 90% of the of the poll participants gave answers that can be considered positive, from a) to c), while only 13% of the participants gave negative assessment answering under d) or even e), as answered by 1% of the poll participants.

A similar pool question was asked: **From the moment of founding your company to date, the company capital**:

a) Grew multiple
b) Grew double
c) Maintained the same level
d) Decreased in value.

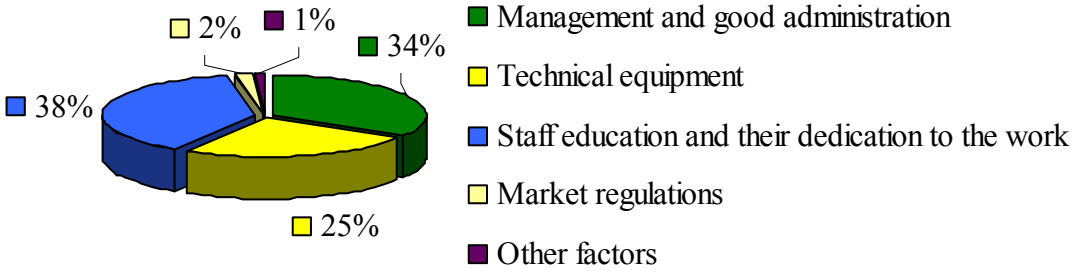
This question was designed at finding out whether the growth of capital existed, which indirectly points to the quality and the demand in the market of geodetic services. The answers are shown in *Graph 3*, with 14% of the poll participants confirming multiple growth, 60% saying that the growth was double while only 26% maintained the same level of capital. An extremely interesting results, and also expected, was that in the territory of Belgrade City Center 38% of poll participants recorded multiple growth of capital. This percentage is slightly different from the overall national level.



Graph 3.: Graphic display of the capital growth of companies

To the question: **Mark the influence of the following factors to the change of capital value of your company starting from 1**; following answers were provided:

a) Management and good administration,
b) Technical equipment,
c) Staff education and their dedication to the work,
d) Market regulation,
e) Other factors.



Graph 4.: Influence of relevant factors to the change of capital value of the company

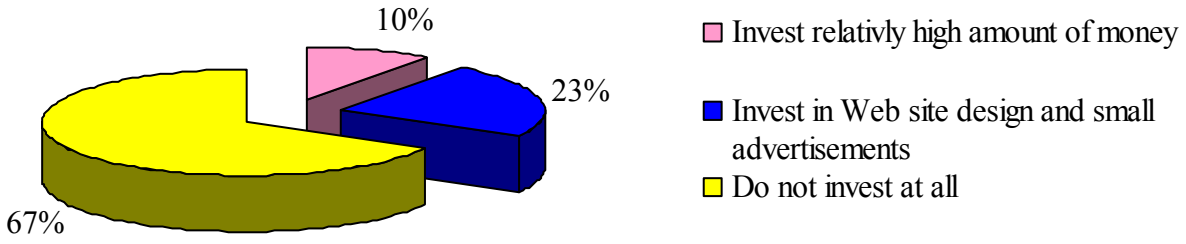
The *Graph 4.* gives the assessment of influence of relevant factors to the change of the capital value of the company given by poll participants. 34% of the poll participants pointed out the primary influence of management and good administration, 25% pointed to the technical equipment, 38% said staff education and dedication to the work , while only 2% put market in the first place, while 1% pointed out the influence of other factors. Significant variation compared to the national average was recorded in Belgrade City Center territory where 58% of the participants pointed out the good management and administration and the region of the town of Uzice, where 53% pointed out the education of the staff and their dedication to the work.

When asked to comment **The funds used for promotion and marketing of the company – workshop**; following answers were offered:

a) Relatively high amount of money – participation in geodetic exhibitions, sponsoring geodetic meetings and other events;
b) Invest in Web Site design and small advertising material;
c) Do not invest at all.

Graph 5. shows the results as collected in the entire territory of the Republic of Serbia. Out of

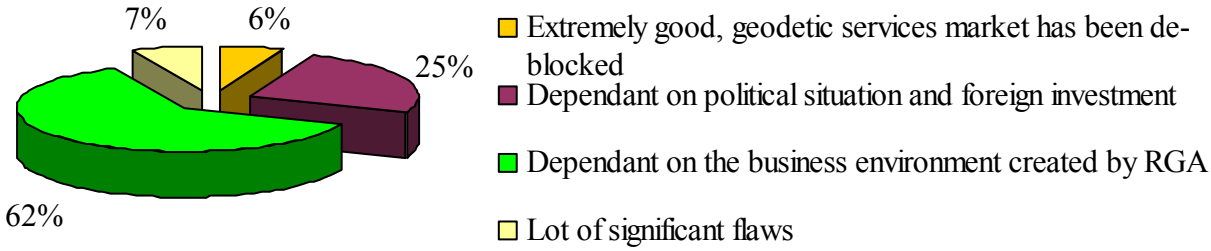
the total number of poll participants, 10% said that they invest relatively high amounts, 23% said they invest in Web sites and small commercials, while 67% said they don't invest in these purposes.



Graph 5. : Investing in the promotion and marketing

To the question: **Your opinion on the influence of the transition to the geodetic services market in the Republic of Serbia;** following answers were offered:

a) Extremely good, geodetic services market has been de-blocked;
b) Dependant on political situation and foreign investments;
c) Dependant on the business environment created by RGA;
d) Lot of significant flaws.

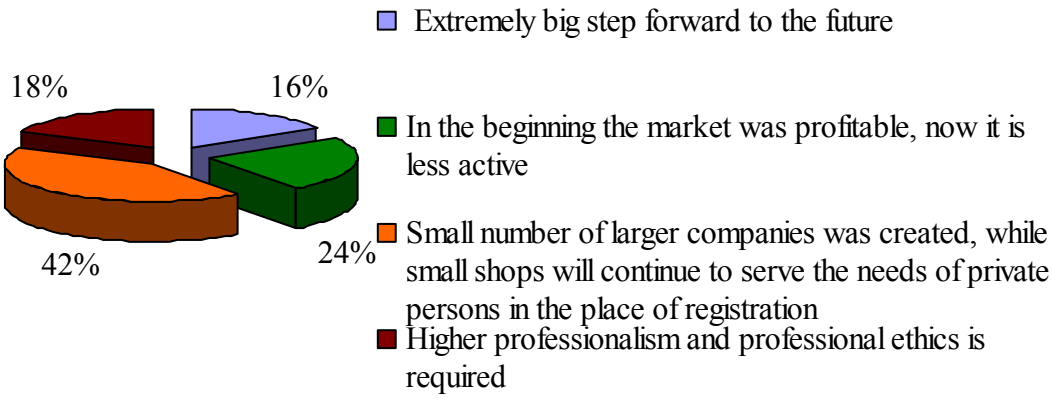


Graph 6.: Assessment of the influence of transition to the geodetic services market in Serbia

Graph 6. shows the assessment of the influence of transition to the geodetic services market by the geodetic companies that participated in the research poll. Out of the total number of participants, 6% pointed out the de-blocking of the geodetic services market, 25% pointed to the dependence on political situation and foreign investments, 62% emphasized the dependence on the business environment formed by the RGA, while 7% warned on the existence of a number of significant flaws.

To the question: **Your assessment of the development of private companies in the first 8 years of transition**; the following choice of answers was offered:

a) Extremely big step forward to the future;
b) In the beginning the market was profitable, now it is less active;
c) Over time, small number of larger companies was created, while small shops will continue to serve the needs of private persons in the place of registration;
d) Higher professionalism and professional ethics is required.

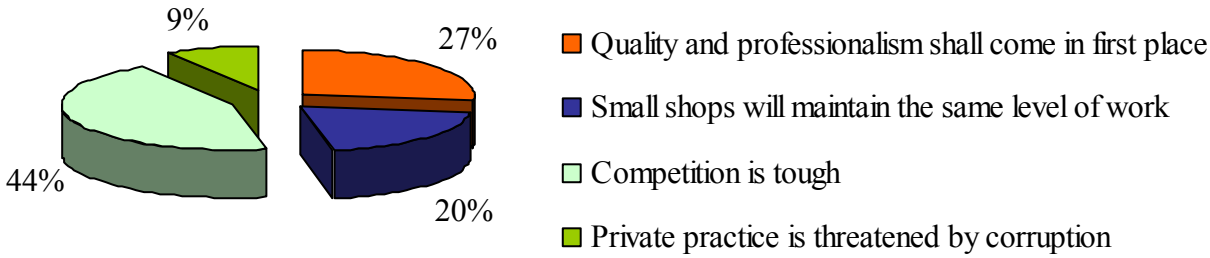


Graph 7: Assessment of the development of private companies in the first 8 years of transition

At the level of the Republic of Serbia, 16% of the poll participants said that a huge step towards the future was made, 24% pointed to the lack of activities on the market, 42% pointed to the trend of creation of smaller number of large companies, while 18% emphasized the need for higher professionalism and professional ethics (*Graph 7*). No significant differences in answers were noted on the level of average for the whole of Serbia.

When asked to comment **Your view of the development of the private practice in the future;** following potential answers were offered:

a) Quality and professionalism shall come in first place;
b) Those with professional management capable of handling large businesses will survive, while small shops will maintain the same level of work;
c) Competition is tough, code of conduct and minimum work price definition required;
d) We are threatened by corruption.



Graph 8.: Assessment of the expected influences in the future

On the national level, 27% of the participants said that they foresee growth of importance of quality and professionalism in the future, 20% pointed out the influence of management in obtaining large businesses and concluded that small shops will maintain their current level of work, 44% pointed out to the presence of tough competition and the need for definition of code of conduct and minimum price of labor as the prerequisites for successful business, while 9% warned of the presence of corruption in the geodetic profession in Serbia (Graph 8.).

4. CONCLUSION

Based on the thus far conducted research studies of the development of the geodetic market in Serbia, as well as based on the results of above described research poll, following can be concluded:

- With the Law on State Survey and Cadastre and Registration of Property Rights coming into effect in May 2002, relevant legislative framework was created for the formation and development of geodetic companies.
- Total of 631 geodetic company are registered in the Republic of Serbia, mainly in private ownership, all complying with the relevant legislative requirements.
- Restructuring of geodetic companies in Serbia was done relatively quickly and successfully. On one hand, the Republic Geodetic Authority as the national institution is focused mainly on the establishment of the real estate cadastre as its priority task, while on the other hand, the development incentive was given to the private geodetic companies that undertook field and operative geodetic works.
- Partnership relation was established between the Republic Geodetic Authority and the newly formed geodetic companies with clearly divided duties and responsibilities.
- The financial effects of the changes have also been positive. The private sector increased its starting capital and has been doing business relatively well (research poll results confirm this) and has thus contributed to the increase of funds in the government budget (through collection of administrative fees and taxes). On the other hand, the budget of the Republic Geodetic Authority shows the tendency of moving RGA toward greater self-financing and budget independence, since, at the moment, RGA receives an annual budget from the Government of Serbia on the basis of a regular annual budget request. RGA is a significant revenue earner from the fees collected for registration and other services. All RGA revenues are deposited in a central revenue account for Government of Serbia. There are restrictions on the use of these funds as earmarked revenue cannot be used to augment staff salaries. All salaries are set by Government and paid out of the annual budget. Revenues can only be used to offset operating costs.
- The biggest number of registrations of geodetic companies was recorded at the very beginning of the process, after the new legislative framework came into effect in 2002, which demonstrated quick transformation from governmental to private sector.
- The biggest concentration of geodetic companies is recorded in the area of the Center for Real Estate Cadastre in Belgrade, where 189 geodetic companies are registered, which represents 29.95% of the total number of registered geodetic organizations. The said REC Center also records higher percentage of registered geodetic companies than geodetic entrepreneurs, much larger than in the other parts of Serbia.
- In the region of Belgrade City Center, the analysis of the research poll shows positive effects of the development of geodetic organizations, in the sense of multiple increase of company capital, better technical equipment and staff, higher understanding for the importance of promotion and marketing, putting higher emphases on the good management of companies. The reasons behind this rest in the direct influence of the economic growth of the capital, bigger number of investments and better opportunities for making contacts with international partners, etc.

- Further investments in the field of work of geodetic companies will require analysis of justification of investments, analyses of the market, competition, continuous existence of geodetic projects, which certainly leads to the need of development of business plans for geodetic organization.

Government and public administration in Serbia are undertaking measures to reach the European standards and values in all areas of society. Geodetic profession in Serbia is in the expansion and goes in line with the social and economic changes occurring in the country. The investments into the road infrastructure of the country, development of real estate cadastre, construction of housing and business structures, development of real estate market all created preconditions for development of geodetic profession in Serbia and it is realistic to expect that this trend will continue in the years to come.

ACKNOWLEDGEMENT

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BIOGRAPHICAL NOTES

Prof. Dr. **Zagorka Gospavić**, born in 1959. Graduated in 1983 as Dipl.-Eng. in Geodesy and obtaining doctorate degree in 2002, both from Belgrade University. Until 1988 worked as teaching assistant at Belgrade University. Since 2003 Assistant Professor of Geodetic Management at the Faculty of Civil Engineering.

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