



# Synergetic influence of INSPIRE and GNSS on spatial information providers and users in Adriatic region



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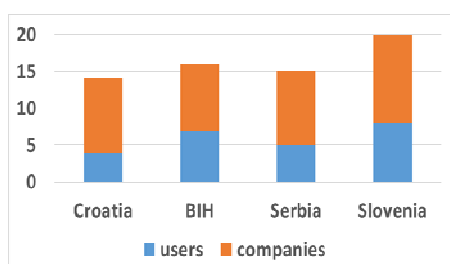
## Introduction

One of the characteristics of modern globalized World is extensive usage of spatial information. This usage is presently defined through the introduction of spatial data infrastructure (SDI) and by rapid expansion of GNSS technologies usage supported with mobile communication infrastructure. In Europe INSPIRE directive defines globally most advanced and in many aspects implemented SDI concept, while in GNSS technologies, in expectation of fully operational Galileo system, we still rely mostly on American GPS. Influence on professional groups as well as on general population and society has been separately for both developments well investigated worldwide and in Europe (Crompvoets et al 2004, Pietka and Urrutia 2010). This is not the case if we attempt to express or even measure joint influence of those complementary developments so important for modern society and expected to be even more important in near future.

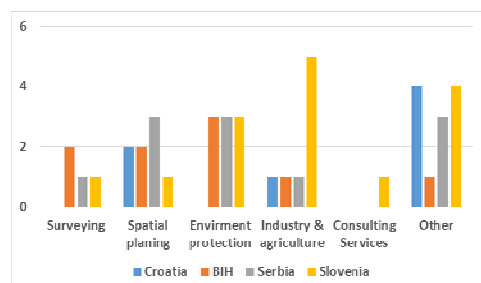
Recognizing that fact an effort has been made jointly by scientists from four countries in the Adriatic region: Bosnia and Herzegovina, Croatia, Serbia and Slovenia in the frame of Synergy project, financially supported by Ministry of science, education and sport of Croatia to investigate this question. Beside the known influence of INSPIRE and GNSS itself investigation has been launched about synergy and synergetic influence of those two developments on spatial data providers, mainly surveying and geoinformation companies, and spatial information users, mainly governmental bodies and public agencies. Relying on work done by Crompvoets and other authors, like Crompvoets et al 2004, a questionnaire has been developed and disseminated in all four countries simultaneously among both target groups (providers and users) and gathered data analysed. Due to the fact of different level of SDI development (INSPIRE directive implementation) and also different level of GNSS technology usage and data provider sector organization, comparisons has also been made based on those criteria's.

## Research

In each of four countries to similar number of subjects (14 - 20) a questionnaire with 30 questions has been distributed, see picture 1. Subject groups were primarily companies providing spatial information and GNSS services, and on the user side governmental authorities, various kind agencies and public enterprises all recognized as active users of mentioned information and services, see picture 2.



Picture 1: Research sample per countries



Picture 2: Main field of users activity

Due to the fact of different level of SDI development (INSPIRE directive implementation) and also different level of GNSS technology usage and data provider sector organization, comparisons has also been made based on those criteria's. Analysis has also been made for countries, like Aleksić et al, 2014.

## Literature:

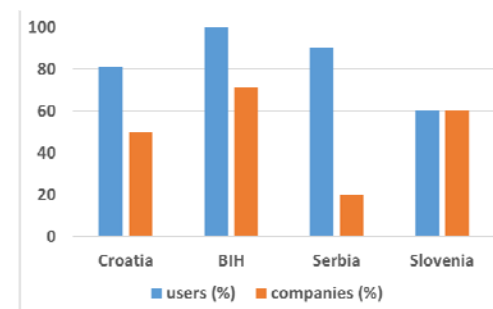
**Aleksić, I.R, Bačić, Ž, Gučević, J, Miličević, D:** Sinergijski utjecaj GNSS-a i NIGP-a na upravljačke procese u Republici Srbiji, GEO2014 Konferencija, Kopaonik Srbija, 15.-16.05.2014.

**Crompvoets J, Bergt A, Rajabifard A, Williamson I:** Assessing the worldwide developments of national spatial data clearinghouses. Int. Journal of Geographical Information Science, vol.18, no.7, October-November 2004, 665-689.

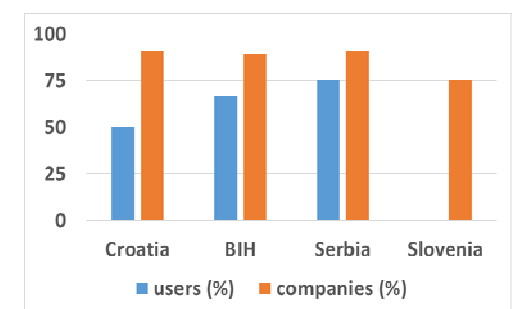
**Pietka A, Urrutia B:** How Galileo Can Help Europe, Inside GNSS, January/February 2010, 45-49.

## Results

Usage of GNSS technology is understood as standard in both target groups and is extensively used in all countries. Usage of GNSS is understood as necessity, has increased companies business volume, see picture 3, and investments in GNSS equipment have been successfully recovered (except in Slovenia), see picture 4.

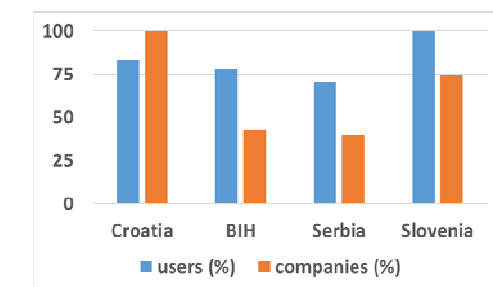


Picture 3: Increase of business volume YES in %

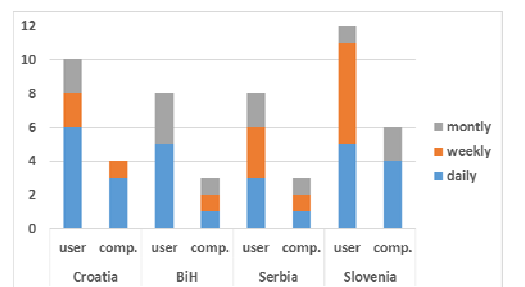


Picture 4: GNSS equipment investment return YES in %

Recognition of SDI concept is high among the questioned subjects (except in BiH), having clear understanding of benefits of SDI for companies and institutions. This is resulting in high percentage usage of internet services for providing the spatial data, see picture 5, and with high intensity (especially in Slovenia and Croatia), see picture 6. There is visible correlation between duration of INSPIRE directive implementation with number of institutions providing data (in any kind of form) via internet. While percentage in Slovenia is 100% it goes down to 50% in BiH.

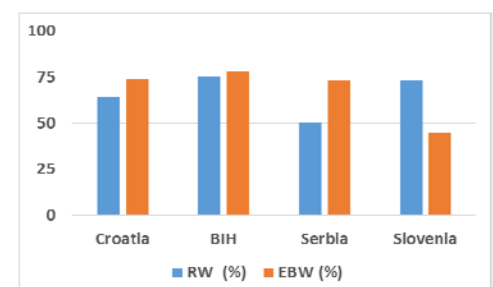


Picture 5: Internet services usage YES in %

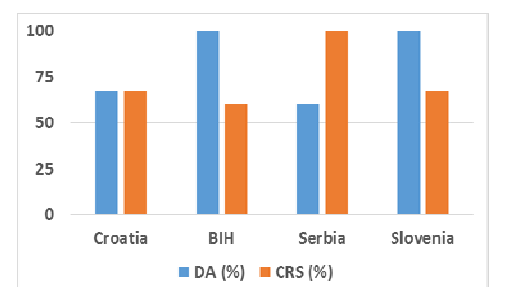


Picture 6: Frequency of internet services usage

Combining effects of implementation of SDI concept and usage of GNSS technology and looking for their synergetic effects was third part of questionnaire. It gave us view in institutional and business subject's perception of SDI/GNSS synergy. There is rather clear perception that new technologies are reducing workload (RW) for collection of same amount of data (except in Serbia) and that they are expanding business volume (EBV) (except in Slovenia), see picture 7. Similar results were gained for institutions, especially regarding reduction of data acquisition time (DA) and simplification of customer relations and sale (CRS), see picture 8.



Picture 7: Workload reduction and business volume expansion YES/NO in %



Picture 8: Data acquisition time reduction and customer relation improvement YES/NO in %

## Conclusions

Having in mind that research sample was limited the results of this research is showing that both SDI concept and GNSS technology are well presented in all four countries. Subjects in both target groups have recognized benefits from SDI and GNSS. It is also clear from replies that synergy of SDI and GNSS is additionally increasing potential of companies and expanding their field of activity, even in tough economical time. For institutions data acquisition and customer relations have improved as well as other indicators. Carried out research is therefore clearly indicating positive synergetic effect of SDI/GNSS implementation in both, business and public sector.