

Challenges in technology, society and policy - how they influence Cadastre and Land Management

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Key words: Cadastre, Land Administration, GIS

SUMMARY

During the last years there has been many, rapid changes in the world, including political, societal, natural and technological issues. Technology reform in the field of instruments, sensors (e.g. UAV, GNSS, LIDAR, In-door positioning) has led to a big amount of data to be processed, faster processing of them and reduction of reaction time. New technologies in database transactions (e.g. blockchain) could revolutionize not only Land Administration, but any procedures in the life of the citizens.

Beside the technology the political environment has also changed. From the open mind policy, global political actors has changed to a more closed line, and sometimes reversed their roles. New economic and political conflict zones have arisen, which led to a migration level, which has never seen.

This alteration in political meaning has a great impact on society as well. People does not feel safe themselves and their assets as before, but they need this security. But in contrast with this lock-in and fear the internet and social media connects people all around world, and they are able to share their experiences and ideas. So the people are opened to each other as never before, but they need more security, this is contradiction.

Do these issues have an impact on Land Management? The paper shares the ideas of the author on Cadastre, Land management, and the whole Surveyor Profession as well.

SUMMARY (optional summary in one other language in addition to English, e.g. your own language)

Type the summary in the second language here ...

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1. INTRODUCTION

After the economic crisis in 2008 something has changed in our world. New political, economic concepts have arisen together with new politicians. Unfortunately new conflict zones started up and the openness of the world was getting more-closed.

It is an interest situation, because the fast technological developments all over the world should affect a more-open economy and society as well. Technological reform in the field of instruments, which are used for positioning, has a huge impact not only in the professional field, but the whole society. FIG initiative on Spatially Enabled Society shows the importance of this issue (FIG, 2012).

This paper deals with the above issues and tries to share some ideas and possible solutions on them.

2. OPENNESS VERSUS CLOSENESS

Technological developments strongly influences our world into the direction of openness. Internet, Social media, Meta-platforms are all opening the world for everyone and everywhere. Fast transport, information exchange and others are also increasing this openness among countries, societies and individuals. Everyone can be informed of anything. It is very important, that not only the rich, developed countries' citizens are coming in for this information, data sharing, but the poorer side of the world as well, thanks for the advanced communication technology. All in all technological developments strengthens globalism.

But after the global economic crisis in 2008., new economic and political concepts have arisen, which affect into the opposite direction than globalism. The countries became more-closed, national interests were increased against the global needs. As it was mentioned by Mr. Nick Wilkinson:

„Accelerated globalism kindles nationalist emotions, which are not compatible with the laws of liberal market economy. Political leaders are not able to resolve this contradiction.”¹

And the citizens, the people, both in the developed and developing side of the world, are staying under this double pressure. They like to come in for the benefits of the globalism, but are living

¹ Interview with Mr. Nick Wilkinson, Former DA-Notice D-Notice Secretary UK, in the newspaper Magyar Nemzet, Budapest, Hungary, on 13th September 2017. Translated from Hungarian by the author

in a more-closed political, societal environment. But what a citizen needs? Safety and peace, which are not really achievable in such a situation.

3. TECHNOLOGICAL CHALLENGES

Checking the trends, which influence Land Administration in our days, the following could be found (Figure 1.):

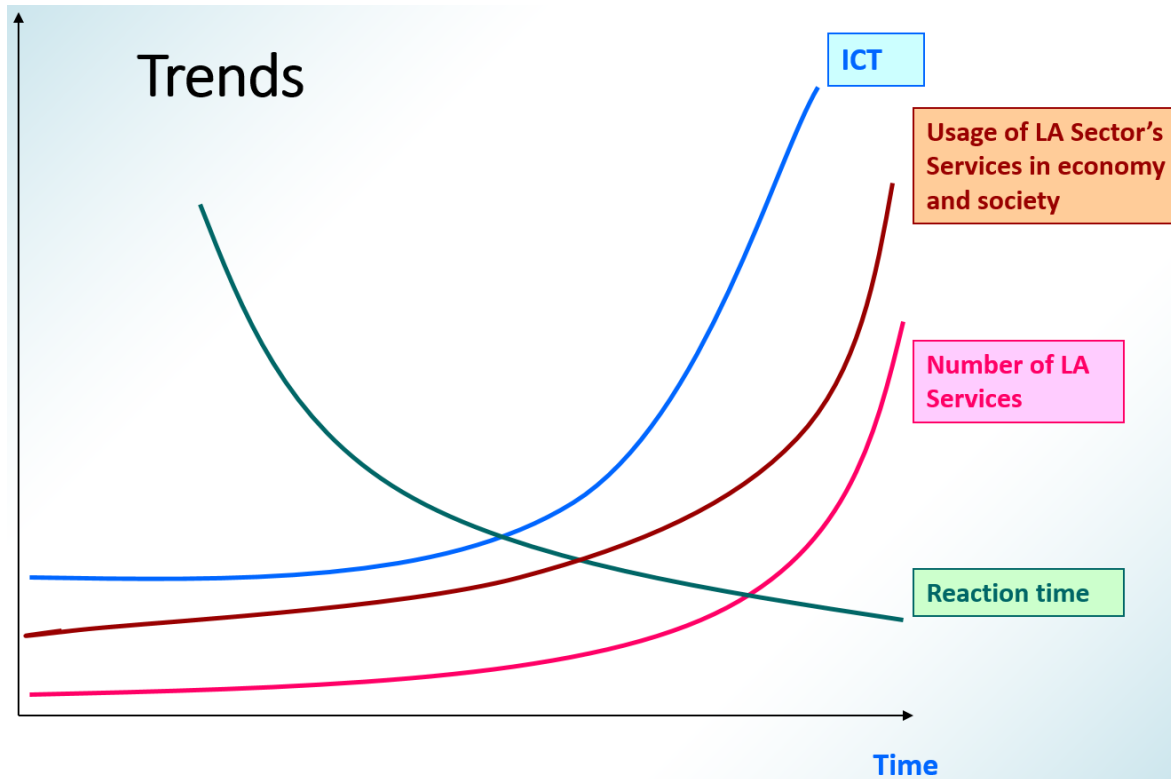


Figure 1.: Trends in Land Administration

The fast development of InfoCommunication Technology (ICT) has the strongest influence in Land Administration processes. Usage of Services in economy and society is increasing together with ICT and the number of Land Administration Services, but the Reaction time of Land Administration is getting less and less. This is one of the main challenge for Land Administration in these days.

Above only the trends were mentioned, but the continuous developments of different instruments, sensors in the field of positioning (e.g. UAVs, LIDAR, In-door positioning) become more and more important not only for the determination of location, but the monitoring of changes.

In the field of Land Administration, Land Management Remote Sensing methods and technics are generally not discussed on the level, which they should be deserved. As an example, Department of Geodesy, Remote Sensing and Land Offices of the Government Office of the Capital City Budapest, Hungary has really good results in the usage of remote sensing technics on Land Management. Own-developed solution for the mixed use of optical and radar-polymetric are successfully utilized in the monitoring of different agricultural hazards, from the effect of western corn root worm till hailstorm damages (Figure 2. and 3.).

**Ordered and disordered „grating”.
Different effect on polarized waves.**

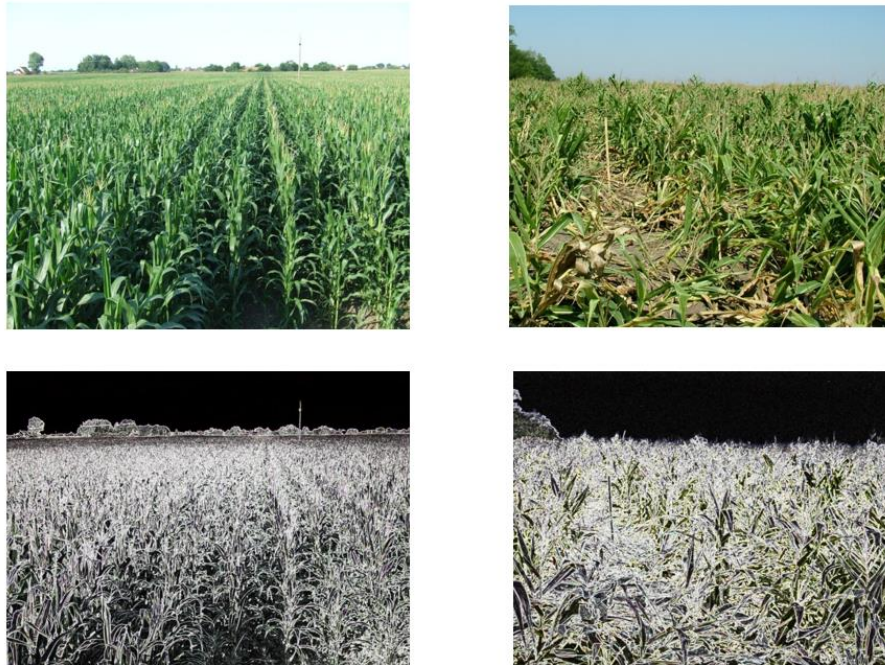
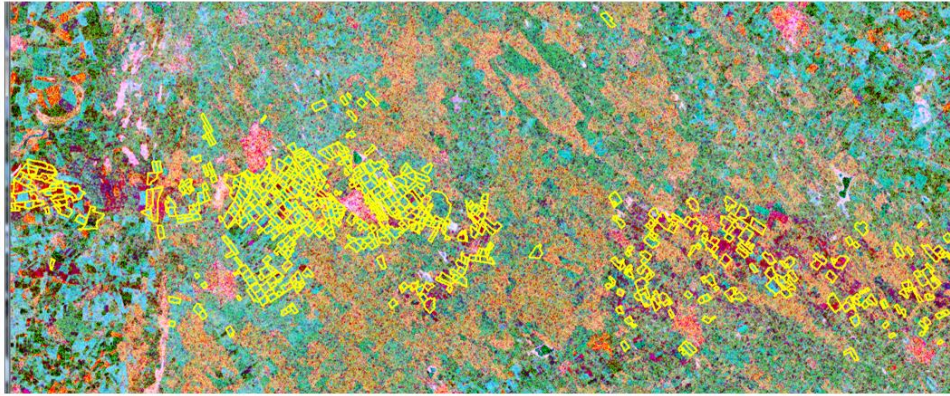


Figure 2.: Western corn root worm damages (Surek et. al. 2012)



LPIS blocks of claims of damages and damages detected by the analysis of radar satellite images are coincided well
 Analysis were carried out within 10 days after the storm
 (including satellite image purchasing)

Figure 3.: Hailstorm damages (Surek et al., 2016)

New devices introduced new definitions in our profession. Positioning replaced field measurements, smart devices arose crowdsourcing (FIG Commission 7. WG 7.3), new, multispectral sensors increased the importance of change mapping. In some cases algorithms solves positioning problems, usage of augmented reality is a reality, cadastral parcels become an intelligent object on the field etc.

This fast technological development requires new conceptual solutions such as Land Administration Domain Model ISO 19152:2012 Standard (LADM). Introduction of this standard was one of the most important result in Land Administration in the last decade. It is a conceptual model for designing Land Administration systems, an interface for exchanging information among Land Administration Systems. LADM became a common Land Administration “language” all over the world. And it a very a very important issue, that the development of LADM continues.

A real high technological (and legal) challenge is 3D Cadastre. A joint working group of FIG Commission 7. and 3. are working on this issue. 3D Cadastre is not only the extension of traditional cadaster to the third dimension. In 3D Cadastre the most important theme is the handling of 3D rights, restrictions and responsibilities (RRRs).

Building Information Modeling (BIM) is a new, real complex solution for the management of physical and functional characteristics of places, structures etc. Spatial (and sometimes legal) information are indispensable in design, construction, operating and maintenance of buildings. Therefore the importance of surveyors, spatial and land knowledge are increasing in BIM. Based on the spatial knowledge of surveyors, we surveyors have an integrating role in any BIM solution. It is interesting, that in many languages the word “engineer” is derived from engine

(motor). But in Hungarian language this word derived from "surveyor" (mérnök), which shows this integrating role of geodesist.

Financial techniques (Fintech) have just arrived in Land Administration, thanks for the wide usage of blockchain technology. Blockchain is a real challenge, since it looks like, is able to revolutionize Land Registry, and Land Administration all over the world. by the use of blockchain technology all transactions will become transparent, irreversible and publishable, which shows its importance. (van BOCHOVE et al., 2016) But an important question arises related to this characteristics, all the politicians like such a Land Administration system?

The above mentioned technological challenges strongly influences the future of Land Administration systems. The operation of systems should be faster, more reliable and highly automated, including document handling, processing and decision making. This is not only a technological challenge, but a defiance in organizational structure of Land Administrations as well, including human resource management. Since Land Administration "is the process of determining, recording and disseminating information about the relationship between people and land" (LADM, 2012), these changes also impact the society, the people. Therefore Land Administration has a great responsibility to prepare citizens for these new situation.

4. MIGRATION

This paper deals with the challenges in society, policy related to Land Administration. Migration nowadays is one of the greatest challenge in the world. Does it have any relation to Land Administration, Land Management? This issue will be discussed in the next.

Checking the reasons of migration different motives could be found (not all issues are discussed).

The first one is the crisis (war) on the land, where the migrants are living. Because of the crisis, the people do not feel safe themselves, therefore they leave their lands. In this case is better to speak about refugees than migrants.

The second reason could be the climate change, which causes also insecurity on their land. Everyone knows about the rising sea level, desertification etc. FIG Commission 7 WG 7.2 deals with these problems and its effect on Land Administration.

The third issue is an interesting problem relates to the globalism, the openness of the world. Nearly all people of the world has smart, mobile devices, which opens the world for everyone. On Internet, in social media there are many information about the living standard of the developed world, including data and images. On the poorer side of the world everyone can have access to this information by their mobile device, and who does not want to live on such a level, which is shown on these websites. They believe that they are able to receive such quality of life, or at least higher living standard than on their homeland.

Land is not only an economic, but an emotional issue as well. People like their homeland, where they were born. They know the environment, the neighbors, the living conditions etc. In normal case people do not want to leave their land, selling all their assets, and go to an unknown place, situation. Strong reason is needed to do it.

Beside the above mentioned issues of migration, the insecurity of Tenure could be reason, why people leave their home. One of the main conclusions of Hernando de Soto's famous book, *The Mystery of Capital*, is that, the assets are not able to act as capital because of the missing or lack of Land Administration in developing countries. This fact has great impact on national economies, because it slows economic and social development of the certain country, and causes losses in the income. Effective economic development does not exist without Land Administration. If people would be able to register their properties in a Land registry, which provides formal titles on their lands and guarantee them, migration from developing countries could be decreased. FIG initiative and solution on Fit-for-Purpose Land Administration provides a flexible solution for this problem (FIG Commission 7, WG 7.1).

Of course there are global actions such as Global Campaign for Security of Tenure by UN-HABITAT and other institutions, which likes to provide secure tenure for 80% of people in the world, but the author is not sure, that this fantastic goal will be reached. The developed world should invest, even country by country, more resources for the development of Land Administration systems in the developing countries, following the principles of fit-for-purpose land administration, increasing economic production and lowering migration.

5. CONCLUSION

In this paper the author liked to share his ideas about the challenges in technology, society, policy and their effect on Cadastre and Land Management in these days. Fast developments deeply change the technical environment of Land Administration systems. ICT developments has a great influence not only on technique, but the whole society as well. This affect strongly determines the future of Land Administration systems.

Migration is also a global economic, societal problem. It has many relations to the Land, to Land Administration systems. More investment by rich countries to Land Administration systems development in developing countries could lead to a more peaceful and safe world, which are the base needs of citizens.

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BIOGRAPHICAL NOTES

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