

Dr Marta Rekawek – Pachwicewicz, Judge at Bialystok Regional Court, Poland and Editor-in Chief
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Legal and technological aspects of the implementation of proposed EU law on Artificial Intelligence in the land registry systems

The topic of artificial intelligence (AI) is currently one of the most discussed when it comes to setting trends and directions for countries in Europe. Undoubtedly, this process was accelerated by the Covid pandemic of 2020 - 2022, as it drew attention to the rapid development of digital instruments and their impact on everyday life, not only in the private, but also in the public sphere, which undoubtedly includes state activities in the sphere of land registers.

Similarly, the European Union could not remain indifferent in this sphere either, hence already in 2017 European Council pointed to the need to be "aware that new trends require an urgent response", which includes "issues such as artificial intelligence (...) while ensuring a high level of data protection, digital rights and ethical standards" (*European Council, Extraordinary European Council (1 and 2 October 2020) - Conclusions, EUCO 13/20, 2020, p. 6*). The next steps followed this approach and finally on 21 April 2021 European Commission tabled a proposal containing a draft Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (**Artificial Intelligence Act**) and amending certain legislative acts of the Union. Also not to be overlooked is the **Digital Services Act and Digital Marketplaces Act (DSA and DMA) package**, in force since autumn 2022, which aims to create a secure digital space in which users' fundamental rights are protected and to create a level playing field for entrepreneurs¹. However, as always, the modernisation efforts to harmonise and standardise both the phenomenon and the process of its implementation itself, preceded projects that were already in operation much earlier and were being implemented in some European countries.

Due to the subject of my presentation, I will, of course, present some examples of the application of artificial intelligence solutions by EU countries in the field of land registers, surveying and cartography, before moving on to the presentation of the very concept of artificial intelligence and its features, as well as the specific solutions adopted in the draft Act and examples of those solutions to which Member States should pay attention in the context of land

¹ <https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package>

registers. The presentation will include also pointing to the conclusions of the conference organised by the Polish Ministry of Justice on '*Ius silico - artificial intelligence at the service of justice*', held in Warsaw in April 2023. Finally, some questions that will be put to you as Contact Points, for your consideration and response **by 18 June 2023**. Their analysis and the conclusions based on it will allow a short study to be sent to the ELRA Board for possible publication.

The first example to support AI with land registry data is the work of the **German Fraunhofer Institute for Computer Graphics Research IGD** in Rostock (state of Mecklenburg-Vorpommern) in cooperation with the Ministry of Infrastructure and Digital Transformation (MID) of Saxony-Anhalt ², which is developing a **self-learning algorithm** to more efficiently and quickly identify suitable plots of land in existing towns for development and thus use far fewer plots of land in existing towns for development and thus use much less virgin land for local residential development. Since 2005 the Ministry has been collecting data on parcels of land with development of potential using information from geodata and land registry systems, which have been combined with aerial photographs and remote sensing satellite data. These inputs are checked against specific criteria, and any promising land is then verified by physical inspection. It is essential that planners can identify parcels of unused land within existing developments, areas where density can be increased, and developable sites and unused buildings, in order to develop land in a way that takes into account economic, demographic and ecological needs - with the least possible use of space, especially **virgin land that should serve future generations**. Unfortunately, **this is very time- and labour-intensive, so it was decided to use Artificial Intelligence**. The Fraunhofer IGD development team intends to make this process more efficient by combining geo-information, computer vision and an artificial neural network. A prototype self-learning algorithm is already in use and proving to be effective. It can independently identify plots of land with development potential using semantic segmentation. The algorithm assigns a class to each pixel of a given satellite image and compares it with the zoning maps. It is constantly acquiring new information and fine-tuning its parameters and results - currently providing an accuracy of 86 per cent. This significantly reduces the need for site visits, saving planners time and money. Once identified, relevant plots

² Artificial intelligence speeds up identification of suitable land for development, <https://www.igd.fraunhofer.de/en/media-center/customer-magazine/artificial-intelligence-accelerates-identification-of-suitable-land-for-housing.html>

can then be filtered according to further parameters related to urban development goals: for example, which plots are close to streets, major motorways or railway stations.

A second example is the use of Artificial Intelligence for **natural language processing for land registry documentation in Sweden**³. The information is dated of June 2019 and comes from the UK Government Digital Service and Office of Artificial Intelligence websites. The project concerned **natural language processing (NLP) for the Swedish Land Registry (SLR), which needed to increase its efficiency when processing land registry requests**. Staff at the Swedish Land Registry received many requests from citizens for information about properties and property rights. In order to make a decision, the case referrers had to review historical information about the property, often dating back to the 50s. They spent about 48,000 hours a year on the manual translation and evaluation of handwritten original documents. The state charged citizens for the number of hours the staff spent working on their application. Unfortunately, the handwritten documents were of poor quality, making analysis difficult. To improve this, the Swedish Land Registry carried out pre-processing of the handwritten documents to improve the quality. To do this, it used a handwritten text recognition system (HTR) to extract information from the handwritten documents. Artificial Intelligence (neural network) was then used to apply word corrections and synonyms to complete sentences with words that were not captured by the HTR system. Once the text was extracted, an AI model was used to highlight key correct names included in the document, for example location, names and abstracts. The adopted model greatly improved the recognition of applicants' requests and helped focus on urgent decisions, staff time was saved.

Similarly, other advanced countries have implemented projects related to improving the operation of land registers with the experimental use of Artificial Intelligence. These include the **Netherlands**: a project to test blockchain technology for national property data to improve the flexibility and efficiency of the organisation, which aimed to explore the legal, technical and governance aspects of the technology (2018⁴). **Estonia** can also be cited as an example: the use of Blockchain technology is being used to ensure the reliability of state registers, such as the Health Care Register or the Land Register, among others⁵. Interesting fact - Estonia is seen

³ Natural language processing for land registry documentation in Sweden.

<https://www.gov.uk/government/case-studies/natural-language-processing-for-land-registry-documentation-in-sweden>

⁴ Blockchain to be tested by Dutch land registry <https://todaysconveyancer.co.uk/blockchain-tested-netherlands-land-registry/>

⁵ e-Estonia, Frequently Asked Questions: Estonian blockchain technology, 2019. - <https://perma.cc/56B2-PPYV> and Ivo Pilving, Guidance-based algorithms for automated decision-making in public administration: an

as a pioneer of the digital revolution to such an extent that the Ministry of Justice has even been forced to dispel rumours that the country is planning to recruit robot judges⁶. Interesting fact - Estonia is seen as a pioneer of the digital revolution to such an extent that the Ministry of Justice was even forced to refute rumours that the country was planning to recruit robot judges . This misunderstanding was due to a rather trivial automation pilot project launched in low-value civil cases (Section 489 2 of the Civil Procedure Code). You can read about these and many other interesting legal developments in Estonia, including planned changes to administrative procedure, in the very interesting article '*Guidance-based algorithms for automated decision-making in public administration: an Estonian perspective*' (2023), published by Ivo Pilving in CERIDAP of the University of Milano. The journal also contains many other valuable texts on the use of Artificial Intelligence in justice and public administration.

It should be emphasised that, in terms of the **application of AI in land registers, it is based on two main issues**: ensuring data consistency and ensuring data security when the data itself is made available (data openness) in favour of the solutions in the indicated examples.

Regarding the future of AI in land registries, one can talk about a direct solution on the base by implementing an advanced **chat-bot interactive with the end-user (citizen), answering questions on the content of the register (in simple words)**. Any other solution should be outside the land registry itself, while within the registry the most important task is to ensure interoperability. The big player on the ground of AI in land registries is of course ELRA with its IMOLA projects.

These bottom-up actions by Member States, examples of which are given, coincide with those of the European Commission, which prepared a **draft proposal for the adoption of the draft Artificial Intelligence Act of April 2021**. It was, of course, preceded by a series of actions, which include, among others, the "White Paper on Artificial Intelligence- A European approach of trust for excellence"⁷ published by the Commission on 19 February 2020. The Paper sets out options how to achieve the dual objective of promoting the use of artificial intelligence and addressing the risks associated with certain applications of this new technology. The Council

Estonian perspective; <https://ceridap.eu/guidance-based-algorithms-for-automated-decision-making-in-public-administration-the-estonian-perspective/?lng=en>, 2023

⁶ <https://www.just.ee/en/news/estonia-does-not-develop-ai-judge>.

⁷ European Commission 'White Paper on Artificial Intelligence. A European approach to excellence and trust', COM(2020) 65 final, 2020.

of Europe has also taken actions, and Polish solutions are also included in its database (Resource Centre on Cyberjustice and Artificial Intelligence)⁸.

According to the draft laying down harmonised rules on artificial intelligence, **Artificial intelligence (AI)** is a fast-growing group of technologies with the potential to deliver a wide variety of socio-economic benefits across all industries and areas of social activity. The project's extensive explanatory memorandum shows the history, reasons and specific objectives of this regulation. Attention should be paid to **the specific objectives**, as the construction of 85 articles of the draft is based on them. These include:

- to ensure that artificial intelligence systems placed on the Union market and in use are safe and comply with applicable fundamental rights law and Union values;
- providing legal certainty to facilitate investment and innovation in the field of artificial intelligence;
- to improve governance and effective enforcement of existing fundamental rights legislation and security requirements applicable to artificial intelligence systems;
- facilitate the development of a single market for lawful, safe and reliable applications of artificial intelligence and prevent market fragmentation.

Already at this point, it should be emphasised that great importance in the work of the European regulator is **placed on security and the protection of rights, compliance with the Charter of Fundamental Rights and the values of the European Union**. It is right because of the examples of concrete risks that the inappropriate use of AI has brought about. It is therefore important to have an effective system of control and supervision of its use in the public sector. The establishment of the **High-Level Expert Group on AI** in 2018, with 52 well-known experts to advise the Commission on AI, also serves this purpose.

However, a responsible approach by the Member States is important. An example is the action of the **Dutch Audit Office**, which found in 2022 that only 3 out of the 9 algorithms met all the basic requirements, while the other 6 did not and exposed the government to various risks: from inadequate control over the operation and impact of the algorithm to bias, data leaks and unauthorised access⁹. Fortunately, they did not relate to land administration systems.

⁸ <https://www.coe.int/en/web/cepej/cepej-resource-center-on-cyberjustice-and-artificial-intelligence>

⁹ Audit of 9 government algorithms found 6 fail to meet basic requirements
<https://english.rekenkamer.nl/latest/news/2022/05/18/audit-of-9-government-algorithms-finds-6-do-not-meet-basic-requirements, 2022>

Because of the above risks, the lack of uniformity and harmonisation and, as a result, the partial loss of trust between Member States, it was considered, the **EU principles of subsidiarity and proportionality** were considered to justify **the adoption of a regulation**. **The choice of this form of legislation** was justified by the need for uniform application of new provisions such as the definition of artificial intelligence, the prohibition of certain harmful practices based on artificial intelligence and the classification of certain AI systems. The application of a directive would not achieve the expected results, it is too weak as legislative instrument. The draft was consulted extensively in 2020 (over 1,500 responses), and among other things the fear of over-regulation was highlighted.

In the draft, it is important to note the **very extensive dictionary of definitions** (44 definitions), mostly of a technical nature, such as 'artificial intelligence system', 'user', 'biometric data', 'emotion recognition system', etc. It also follows from definition that „an artificial intelligence user may be, inter alia, a public authority, an agency or any other body” (Article 3(4)), **with the result that land registries, whether within public administration or the judiciary, depending on the Member State, fall within the scope of the regulation and its standards shall apply to them**. This is clarified in draft recital 37, which states explicitly that "the area in which the the application of Artificial Intelligence systems deserves special attention access to and use of certain essential private and public services and benefits necessary for people to participate fully in society or to improve their standard of living." An area that will indirectly affect the operation of land registries is the application of AI in the banking sector. **Banking is particularly sensitive, classified as a high-risk system**, as it determines access to housing. Here, AI can be used to carry out credit scoring or assess the credit ability of individuals. A badly 'trained' or 'taught' algorithm can apply discriminatory solutions to specific individuals or groups. To avoid this, the implementation of the draft regulation will impose a number of obligations on Member States and their public authorities, e.g. the use of artificial intelligence systems based on social scoring, which could lead to discrimination against certain individuals or social groups.

One of the obligations will be to raise public awareness of artificial intelligence and therefore States will, among other things, organise special information events. Such activities have already started few years ago, one actual example is **mentioned conference of Polish Ministry of Justice "Ius silico - artificial intelligence at the service of justice"**¹⁰, which will result in

¹⁰ <https://www.si-dla-sprawiedliwosci.gov.pl/>

the collection of ideas and good practices for the application of Artificial Intelligence in the judiciary through the creation of a Team composed of court employees at different levels and performing different duties. Polish government has already used such innovation's teams under the Justice Institute of MJ. **Perhaps it would be a good idea to create such a Team within the ELRN, serving to collect good practices in the area of land registers, in the represented EU countries.** This is important because most EU countries are now working intensively on this topic, including the Polish Ministry of Justice.

I therefore ask the ELRA Board to consider this proposal.

Perhaps the start of such cooperation would be to reflect and answer **simple questions** (they will be emailed to you soon):

1. Does your State have any national legislation regulating artificial intelligence in the public sector with a translation into land registers? If yes, which ones? If not, is it planned to draft such?
2. Is the draft EU Artificial Intelligence Act distributed to the staff of your institution? If yes, do they study it? If not, what could be done to improve situation?
3. Can you give examples of the use of AI in the institution you represent related to land registry regulation/management? What are the methods to secure data to fully realise the openness of the data?
4. If yes, what opportunities and risks are involved? If not, what possible solutions could be implemented in your opinion?