Artificial intelligence (AI) is a multidimensional phenomenon based primarily on the collection and processing of information that forms the basis of decision-making processes. Its key is the ability of machines to display human skills such as reasoning, learning, planning, and creativity.

Artificial intelligence is increasingly used in various tools in the social sphere, particularly both in and for business. These tools can take various forms, including software such as virtual assistants, image analysis, internet search engines, or speech and face recognition systems; and the so-called “embodied” AI such as robots, autonomous cars, drones, or the Internet of Things. Of course, these tools are used not only strictly by business but also more broadly by public authorities (courts or public administration) in social life in an ancillary function addressed to entities active in the area of the economy.

From the perspective of local and regional public authorities, the AI approach focuses on excellence and trust, aimed at enhancing research and industrial capacity on the one hand and ensuring fundamental rights on the other. In the latter perspective, ethical aspects related to the use of AI are important, especially the reference to values that should determine the ratio of reaching and using AI in various areas of social life, including business.

Given its huge potential, AI is a concern of regional authorities, as demonstrated by the European Parliament resolution of 12 February 2019 on a comprehensive European industrial policy in the field of AI and robotics (2018/2088 (INI)). The European Union is also working on its first package of rules to respond to the opportunities and potential threats of AI, focusing on building trust in AI, including the impact of AI on citizens, society, and the economy, while ensuring a friendly developmental environment for European scientists, designers, and companies. This proposed package of rules focuses on three main areas aimed at fighting innovation, ethical standards, and trust in technology. The aim of the legal solutions is to protect citizens, while encouraging innovation by providing a legal framework for enterprises.

Recognizing the importance of AI for business and its environment, and the challenges for the legal system, we decided that AI will be the leading topic in the articles published in the first issue of the journal “Law and Business,” thus inaugurating its presence on the academic platform for the exchange of ideas and views.


The Consortium “Economic Security of Poland” is a platform for the permanent exchange of knowledge and experience, and for mutual cooperation between people of science and economy. We would like to invite scientists to present the results of their research in our journal to be analyzed and discussed within the Consortium. On the one hand, this will allow participants of the Consortium to get to know and have contact with scientists around the world, and, on the other hand, it will allow participation in the creation and integration of key knowledge resources, their assimilation, transfer, and more effective use in the development of building the knowledge-based economy.

In the search for normative and ethical principles on which the application of AI should proceed in business and its environment, we should listen to the voice of business representatives, their diagnosis of problems and expectations towards AI, and the regulation of this phenomenon, which creeps into all spheres of society.
As part of the implementation of artificial intelligence projects, Grupa Azoty “Pulawy” SA has carried out a project entitled “Development and implementation of an advanced process control system (APC) for ammonia production plants,” co-financed under the INNOCHEM sectoral program run by the National Center for Research and Development. As part of that R&D project, process instrumentation and control equipment in one ammonia production line was retrofitted according to the guidelines provided by subcontractors selected in a bidding procedure, namely the company Honeywell Sp. z o.o. (system supplier) and the Institute of Automation and Applied Computer Science of the Warsaw University of Technology, which provided substantive support for the company in this project. New valves and measuring systems were installed and the control system was improved. Next, a mathematical model of the ammonia production process was created, and the APC system was subjected to optimization and verification during operation in real conditions. In order to set the calculation algorithms, the responses of the plant to the changes made in the control system were collected. A research team of employees dedicated to the project was deeply involved in this work.

The visible effect of the APC system implementation is better process stability represented by stabilization of the parameters and reduction of the existing limitations in the operation of the ammonia production plant. This has enabled entering the optimal area of plant control, which was physically impossible before the implementation. The economic effects of the project are reduction of natural gas consumption ratio per ton of ammonia and improvement of the heat balance in the plant. As a result, it was possible to reduce the production costs and the carbon footprint of ammonia production by more than 20 kg CO$_2$/t ammonia. Therefore, positive effects were obtained that justify the investment in this type of system in the remaining production lines of the ammonia plant. It is estimated that, as a result of full implementation, it will be possible to reduce carbon dioxide emissions by over 20 thousand tons per year.

Another interesting development is a artificial intelligence project conducted jointly with the start-up company AppsBow, namely a pilot implementation of a training simulator for the staff of the Ammonia Storage Plant. This project is being carried out as part of the ScaleUp acceleration program organized by the Krakow Technology Park, aimed at young companies/startups within the Industry 4.0 area as part of a countrywide initiative of the Polish Agency for Enterprise Development.

The pilot implementation of this system enables a detailed transfer of a real plant to the virtual environment. The software built under the project resembles the latest games. It can train plant operating staff in emergency situations as well as existing routine procedures in a virtual workplace environment. The trainee performs training scenarios in the virtual world, thanks to the use of virtual glasses with controllers. Therefore, it is possible to perform initial OHS/workplace exercises for a simulated valve leak or unloading a tanker containing a hazardous material, which is ammonia. An interesting option is the ability to train a scenario with adverse weather conditions, e.g., a large rainstorm or thick fog, when the orientation on the ground is difficult and performing routine actions requires more time.

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Artificial Intelligence in TUW PZUW (Towarzystwo Ubezpieczeń Wzajemnych Polski Zakład Ubezpieczeń Wzajemnych)

The evolution of the insurance market will be empowered by the extensive adoption and integration of Artificial Intelligence (AI), machine learning, and big data algorithms. AI-based solutions and mechanisms can automate, simplify, and speed up many parts of the insurance processes. AI and related technologies will have an impact on all aspects of the insurance industry, from distribution to underwriting and pricing to claims. AI will reshape the insurance industry in the near future.

Insurers have traditionally used comprehensive data set to make decisions in a wide range of activity. The underwriting practice based on using prior experience to account for unknown risk details will be replaced by decision support systems aggregating more available knowledge about risk factors. The process of underwriting will be reduced to a few seconds as the majority
of underwriting will be automated and supported by a combination of information collected from internal and external sources of data and data-capture technologies, such as smart sensors, drones, AI computer vision systems analyzing thousands of images, and proprietary mathematical models. These information sources will allow insurers to make decisions regarding underwriting and pricing, enabling a proactive approach to the risk. Pricing will be available in real time based on usage and a dynamic, data-rich assessment of risk, empowering consumers to make decisions about how their preventive actions influence coverage, insurability, and pricing.

AI enables a more effective approach for a product bundle tailored to the individual client risk profile and coverage needs. TUW PZUW understands the role of AI-based cognitive risk models in the creation of competitive advantage and more profitable client portfolios in the long term. Hence we have started to build the skills and talent, embrace the emerging technologies, and create the culture and perspective needed to be successful players in the insurance industry of the future.

TUW PZUW implemented advanced algorithms that handle claims routing, thus increasing efficiency and accuracy. AI is capable of making entire insurance claim processes and supporting human adjusters. Claims for motor lines and business insurance are constantly automated, significantly reducing claims processing times. In the case of a motor accident, for example, a policyholder takes pictures of the damage, which is automatically translated into loss descriptions and estimate amounts. AI-driven verification helps identify fraudulent operations and recognize costs that are not related to the filed claim.

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The Road to Digital Transformation in PKN ORLEN

In 2020 PKN ORLEN launched a Digital Transformation Program, a corporate-wide initiative aiming at implementation of the concept of Industry 5.0. Our vision is to deploy state-of-the art technologies that would augment our employee’s capabilities by delivering more accurate and comprehensive data and hence improving the decision-making processes. The Industry 5.0 concept opposes the commonly shared view that new technologies will replace humans in completely automated and autonomous processes--a view which we deem unsubstantiated.

Under the umbrella of a Digital Transformation Program, we implement projects focusing on Artificial Intelligence/Machine Learning, Internet of Things, private 5G, agile ways of working, and may others. Moreover, we are aware that technologies cannot be implemented without honing skills of our employees. Hence, we train them in areas such as data science, advanced analytics, agility, etc.

Digitalization accelerates sustainability goals
In our forthcoming report entitled “There is no decarbonization without digitalization,” we see digital technologies as a powerful lever to achieve sustainability goals. Digitalization can reduce the global carbon emissions by as much as 35% with three functionalities:

- Tracking and analysis of data, including carbon footprint.
- Automation and optimization, especially in energy efficiency and process optimization reducing feedstock, water, and energy use.
- Prediction of process interruption, thus avoiding unplanned shortages.

PKN ORLEN perceives AI as a technology underpinning these three abovementioned goals. We see value added in using artificial intelligence algorithms, e.g., in road transport optimization. We use soft sensors – algorithmically calculated technical parameters used in production areas where placing physical sensors is impossible. We also use AI in people safety monitoring, e.g., in asphalt filling station, where computer vision confirms whether protective helmets have been placed correctly.

Legislation around AI
The greatest challenge we see in AI deployment is the speed of it. Preparation of data-- cleaning it and building algorithms on top of it--consumes much time and requires top-talent employees who have data science competencies, programming skills, and also know the business context. Implementing AI requires much effort and many months of work. At the same time, the
direction of current AI legislation at the European level is moving towards imposing more restrictions on its deployment. It has been proposed that all AI algorithms used in critical infrastructure sectors should be automatically treated as high risk and that algorithms should be audited before they are deployed. In our opinion, the reverse mechanism should be used – i.e., conformity with regulations should be declarative and end users allowed to request conformity assessment and verification by audit bodies through raised objections if needed. We find that enabling to use only the “certified” algorithms will stall the development of AI in the EU and at the same time it will cause uncontrolled migration of algorithm development centers outside the EU, in particular to the US, India, and China, and consequently will not solve the problem underlying the regulations. Moreover, easing the definition of critical infrastructure sectors needs to be done – high-risk algorithms used in the energy and petrol sector do not concern the end customer and do not cause the risk of discrimination of human rights. On the contrary, we strongly believe that EU legislation shall support implementation of AI algorithms that have substantial potential for reducing carbon emissions, as well as resources consumption such as water, energy, and materials. Therefore, such legislation shall be by all means supported especially in the oil, gas, and energy industries.

The above-presented examples of the use of AI in business already demonstrate the complexity of problems related to AI application, and thus open a wide perspective of potential cooperation between science and business to develop optimal solutions for AI’s practice.

We believe that the articles published in first issue of “Law and Business” will become a significant contribution to the global public discussion on AI.

On behalf of the Editorial Board
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Editor-in-Chief

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