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ARTIFICIAL INTELLIGENCE IN PREVENTION, EARLY DETECTION AND TREATMENT OF CANCER

Over the years, people have achieved a lot in the development and improvement of computer technology. One of the industries in which the proper use of such technologies can save lives is medicine.

Artificial intelligence is a technology of creation intelligent machines and especially computer systems that are capable of simulating human intelligence processes. These processes contain learning (obtaining and using already gained information), reasoning and as the result reaching definite or approximate conclusions, and self-correction. Specific applications of AI include a lot of generally useful examples, as well as those that can be used in healthcare. These applications can make a huge change in prevention, early detection and treatment of a wide range of diseases, as well as uncontrolled growth of abnormal cells, better known as cancer.

Statistics of American Society of Clinical Oncology says, that today all clinical decisions are based mostly on 3% of patients who participated in clinical trials (considering that US is a country with a strong cancer control program). It means a huge amount of information collected from other patients, who did not take part in clinical trials is simply not used. In this case, where data can make a big difference, it's invaluable loss.

To change the situation Regina Barzilay, a professor at the Massachusetts Institute of Technology, impacted by her own experience as a breast cancer survivor, decided to structure and automate data, that was collected, and utilize this information to select treatment, personalize it, or to help reduce uncertainty about the outcomes. Together with doctors and a student they started by taking big data in the area of breast cancer pathology, which currently is not used, and translated a free-text to a database. This collection of data makes possible to automatically identify all women that had this condition in the past 5 years and use this knowledge to study the development of cancer.

Other direction that they are working on is developing computer vision programs that can scan large datasets of mammogram images and predict who is currently free of breast cancer, may be at the risk in the future. The benefit of using machines to read those kind of images is obvious. Mammograms are large images read by a human, who can only know limited amount of information, and then it's summarized to a short text. In this case a lot of data gets lost. Machines, on the other hand, are really good at reading millions of such images, comparing them, analyzing every pixel and answering questions that human cannot answer today. They can do it all faster and more accurately. Machines also can be trained to take this mammogram and say whether the patient is likely to develop cancer in the near future, is women heading towards recovery, if patient responds to medication or not and many other things.

Similar technologies have the potential and can be used in the prevention and treatment of any cancer type and also in the entire healthcare field. And it's not only about managing medical records, analyzing tests, CT scans, X-Rays, customizing treatment path but also about such things as virtual nurses that help people monitor

patient's condition and follow up with treatments, between doctors visits, things as drug creation, medication management and etc.

In Ukraine about one third of oncology patients learn their diagnosis already in the late stages of the disease and do not receive special treatment, more than 30% die without living a year after the diagnosis. About 40 thousand people die in a year because of cancer. There is no doubt that the use of AI can reduce these numbers and there are hopes that it will happen in the near future.

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QUALITY OF LIFE INDEX IN THE NETHERLANDS

The quality of life index has a purpose of subjectively assessing the life in the country using objective factors of quality of life. The quality of life index includes such factors as: health, family life, civil life, material well-being, political stability and safety, climate and geography, guarantee of work, political freedom, gender equality.

The Netherlands is one of the leading countries in welfare indicators compared to other countries by the quality of life index.

You can't buy happiness but nevertheless it is a tool for the high life level in a country. In the Netherlands average per capita income is 28783 US dollars a year. But there is a big gap between poor and rich people – 20% earn four times less.

Employment analysis of the Netherlands shows that 75% of people aged 15-64 have a paid job. Nearly 80% of men have a paid job compared to women – 70%. The working age which is set by the government is 23 years old.

Being a qualified specialist with education and ability is a very important factor for job search. 78% of men and 76% of women have successfully finished secondary school. The education system is quite competitive compared to other countries. It is characterized by openness, democracy and innovation. New approaches are applied to improve the level of education.

The average life expectancy in the Netherlands is 82 years. Women's life expectancy is 83 years and men's is 80 years. The level of air pollution is not significant to damage citizens' lungs. Also the country ensures the quality of the water. The quality of the water is important not only for people but also for watering the fields that grow tulips and water supply to farms. Analysis shows that 93% of the people are contented with quality of the water.

There is a high level of civil participation in public sphere. An example is presence of citizens to take part in political processes which is 72%.

Accommodation is inseparable part of the life quality indicator. This is a place not only for sleeping and recreation but also a place where a person can feel safe, be alone, create a family. Accommodation costs are the big part of budget. Citizens spend nearly