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INTEGRATION OF AUTOMATION IN THE CITY OF THE FUTURE

The quality of life was significantly improved in the last century mainly as regards the access to services. However, the heavy industrialization and the increasing population in the urban areas has been a big challenge for administrators, architects and urban planners.

The purpose of the thesis is to present the concept of the future city based on automation of all spheres of life of ordinary citizens.

The tasks are to analyze modern technologies and the results of their implementation in our lives, and on the basis of the data obtained, select technologies that are most effective for their further use in the smart city.

A smart city is an urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently. This information includes data collected from citizens, devices, and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, water supply networks, waste management, law enforcement, information systems, schools, libraries, hospitals, and other community services.

This is not the only advantage of smart cities. Analysts of ABI Research have analyzed the possibilities of cost savings as an accelerator for the development of intelligent urban technologies [2, p.36]. Automation, artificial intelligence and the introduction of the Internet of things will not only substantially reduce the costs of infrastructure maintenance, but will also help to cope with the growing inflow of people into mega-cities around the world.

The European Union has a permanent strategy for achieving "smart" urban growth for its metropolitan city-regions. There are some examples of cities actively pursuing a smart city strategy.

The world's first solar road has been opened in France. The Normandy village now has a 1 kilometer stretch of solar pavement, producing enough power to illuminate the street lights of the village. The road was built by Colas, a large Anglo-French construction company. Colas has apparently been working on its own solar road tech, called Wattway, for at least five years. The panels can provide electricity for street lights, street furniture road signs and buildings. The manufacturers say, four meters of a solarized road can power one household and one kilometer can produce electricity for a town of 5 000 people.

In 2014, a solar-powered cycle path was opened in Krommenie in the Netherlands. In its first year it produced about 3,000 kilowatt-hours (kWh) of electricity – enough to power an average family home for a year.

Now in Netherlands Dutch officials has unveiled plans to build the world's first 3D-printed bridge across an Amsterdam canal, a technique that could become standard on future construction sites. 3D printing meant fewer scarce resources were needed and there was significantly less waste [5, p.1].

Robots occupy the most part in modern medicine. The robot Star is among the novelties. In a recent set of experiments, STAR's inventors showed that it makes more precise cuts than expert surgeons, and damages less of the surrounding flesh. The researchers presented their results at the recent robotics conference IROS 2017. Coauthor Axel Krieger says the next step is to train STAR to deal with tumors that have complex 3D shapes, which will require new cameras for visual tracking and more sophisticated surgical planning software.

They did not stop there. Well-known companies are trying to create a robot that will be the most similar to a person, because they are sure that the next step of the evolution is Homo Technicus. They believe that in the near future a person will have some improvements, such as sensors to augment or improve our five senses, eyes implant to overlay information in our vision, ear implant to adjust external sounds and augment hearing with information, brain implant to telepathically communicate with the digital world, military/defense weapons.

The Hong Kong company Hanson Robotics has very much succeeded in this business by creating a humanoid robot named Sofia Sophia, that was activated on April 19, 2015. The robot, modeled after actress Audrey Hepburn, is known for her (its) human-like appearance and behavior compared to previous robotic variants. According to the manufacturer, David Hanson, Sophia uses artificial intelligence, visual data processing and facial recognition. Sophia also imitates human gestures, she is able to display more than 62 facial expressions and is able to answer certain questions and to make simple conversations on predefined topics (e.g. on the weather). This robot has already visited few times the UN in confidences, and different shows, and it has given several interviews. Moreover, in October 2017, the robot became a Saudi Arabian citizen, the first robot received citizenship of any country.

In order not to embarrass the newly-made citizen living among people, the state of Saudi Arabia began the construction of a new high-tech city NEOM in the Arabian desert, on the Red Sea coast. Since the city will be built from scratch, it will immediately apply all the innovations that you can imagine now. It is assumed that in NEOM will live much more robots than people. The city will focus on industries including energy and water, biotechnology, food, advanced manufacturing and tourism, according to officials. Marc Reibert of Boston Dynamics emphasized that the success of the project will depend on creating the right culture of innovation that will allow for building this technological city of the future, where all services and processes will be entirely automated, food will be grown in the desert, drones will fly in the skies, and there will be a full-scale e-government.

Also, statement by the Saudi Arabia State Investment Fund says that in Neome "all services and processes will be automated to 100%" - this should make it "the most efficient city in the world."

Indeed, today the smart city domain is being characterized by an emerging market that provides novel solutions for creation of the most comfortable, ecologic and energy-efficient city.

Automation is actively developing in all spheres of our lives. In the modern world, this is not limited to the creation of faster or safer machines for industry. In fact, now

automation involves the creation of more sophisticated and intelligent systems that can improve the quality of our lives, extend it and use the latest technology in the field of entertainment making it a little fun. Many developers have a lot of tasks and ideas, which makes automation relevant for a long time.

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THE DEGREE OF MANAGEMENT FORECAST CREDIBILITY. THE BUTTERFLY EFFECT

The butterfly effect is the idea that small things can have non-linear impacts on a complex system. The concept is imagined with a butterfly flapping its wings and causing a typhoon. Of course, a single act like the butterfly flapping its wings cannot