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# Foreword

Emerging technologies and us!

Manuela Epure, Editor-in-chief

*As another year starts, the world is no longer the same, rapid and dramatic changes are occurring, so we must adapt to our new environment, in the most efficient ways possible. The people who fail to do so seem to end up excluded, leading me to believe that new technologies, now more than ever, are driving our everyday lives.*

*I wonder how my ability to use the computer and computer-related facilities will decline if I shut down my all ICT devices for one day, let alone an entire week or even a month. Have you ever done it? I, for one, haven't tried simply because I am really afraid that the rapid pace of progress will overcome my capacity to learn and use these devices. Nowadays, it is clear that my core objective should be to increase my own capacity to learn continuously and to be in a symbiotic connection with the world of new technologies surrounding us.*

*Recently, World Economic Forum published a very interesting report "Top 10 Emerging Technologies of 2015"[1], in March 2015. I just read it and I couldn't take my eyes off it. Bernard Meyerson – Chief Innovation Officer at IBM Corporation argues that: "technology is perhaps the greatest agent of change in the modern world." He is confident that technological breakthroughs promise innovative solutions to the most pressing global challenges of our time.*

*For the record, in 2015 a major progress will be registered in zero emission cars that run on hydrogen. These vehicles are equipped with fuel cells able to generate electricity directly using hydrogen or natural gas. The market price of such a vehicle will be approximately 70,000 USD, and that reminds me that new technologies are not for everyone. Economists are optimistic that more cars will be produced and sold, and the price will more likely go down significantly in the next couple of years. Therefore, mass-market fuel-cell vehicles are an attractive prospect, because they will offer a viable alternative to the today's diesel and petrol-powered vehicles.*

[1] Top 10 Emerging Technologies of 2015- Global Agenda Councils , World Economic Forum's Meta-Council on Emerging Technologies, March 2015

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*Next generation robotics is coming to life. Human imagination has long foreseen a world where robots take over all manner of human tasks. Advances in robotics technology are making human-machine collaboration an everyday reality. Robots are becoming more connected due to the cloud-computing revolution. Human–robots interaction has raised a number of ethical and philosophical debates. Nevertheless, the supremacy of humans cannot be undermined, despite the fact that robots' capability to learn is no longer a fantasy.*

*Another trend of 2015 in technologies is related to the recyclable thermosetting plastics – a new kind of plastic to cut landfill waste. Last year, critical advances were made in this area, with the publication of a landmark paper in the SCIENCE journal, announcing the discovery of a new class of thermosetting polymers that are recyclable. The new structures are rigid, tough, and resistant to heat, with the same potential applications as their unrecyclable forerunners.*

*Precise genetic-engineering techniques will replace conventional engineering that has long caused controversy. New techniques allow us to directly "edit" the genetic code of plants in order to make them, for example, more nutritious or better able to cope with a changing climate. These innovations will be particularly beneficial to small farmers in developing countries. As such, genetic engineering will become less controversial when people get to see their effectiveness translated in income boosting and the improvement of the diet of millions.*

*Additive manufacturing is the future of making things, from printable organs to intelligent clothes. 3D products are no longer a fantasy, printing human cells is now possible with numerous application in medicine and 4D printing will make possible the existence of a new generation of products that can alter themselves in response to environmental changes.*

*The emergent artificial intelligence is the science by means of which the computer does the things that people can do. Over the past recent years, the artificial intelligence has advanced significantly and today, for example, self–driving cars are no longer a futurist dream.*

*Another trend includes distributed manufacturing – the factory of the future is online and on our doorsteps. The main idea of distributed manufacturing is to replace as much as possible the material supply chain with digital information Distributed manufacturing will encourage broader diversity in objects that are today standardized.*

*"Sense and avoid" drones – flying robots which check power lines or deliver emergency aid – is one of the emerged trends in technologies in 2015. The next step in drone technology is to develop machines that can fly themselves, interacting with local environment and being able to sense and*

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*to respond to detected changes. A lot of applications can be developed based on this technology, from checking classical systems in place, accessing places where humans cannot reach, to reacting in case of medical emergency situations … and this is only the beginning.*

*Neuromorphic technology – refers to computer chips that mimic the human brain. Today's supercomputers are not even close to the sophistication of the human brain. The essence of computer functioning is linear movement of data backwards and forwards, between memory chips and central processor with a relevant high speed. The human brain, on the other hand, is fully interconnected and the brain cells are in multidimensional interconnection, too. If a certain task requires it, the connections between neurons are rapidly changed and the action emerges as a result of rapid evaluation of the situation. More and more, technology is tackling biological systems in a mimetic approach, and such is the case of neuromorphic technology.*

*Finally, experts listed digital genome as one of the emerging technologies of 2015 – today's specialists are working to make possible to sequence and digitize the human genome in minutes at a very low cost. The result is supposed to be delivered on your computer or on a USB stick. This is a promising revolution in providing personalized and effective healthcare.*

*This is the short journey I have invited to accompany me on, a starting point for deeper reflection on the future. How is the near future going to look like? How will it be for us to adjust ourselves to the new environment? Should we be satisfied with the new rapid technological development or should we be afraid of it?*

*Nevertheless, the "picture" offered above is, broadly speaking, the reality of 2015 and of the years to come. Enjoy dreaming about it!*