

THE INTERACTION BETWEEN THE “GREEN” AND “DIGITAL” ECONOMY

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Abstract

The research focuses on the interaction between information technologies and the „green” economy. In the 21st century information technologies contribute to the advancement of the „green” economy. Key innovations are made through the use of IT in the context of their sustainable development. Sustainability is the quality of an anthropogenic activity carried out without exhausting available resources, without destroying the environment, and without compromising the possibilities to meet the needs of the next generation. The methods and materials used in the paper are the following: graphical analysis, methods and techniques for formalizing and systematizing information, static and dynamic methods. At the same time, the authors studied a series of 5 significant indicators over a period of time: the population growth; the impact of industrialization; the effects of pollution; the demand for food; trends of depletion of natural resources, in order to study the impact of information technologies on the “green” economy. As result, the authors determined the interaction between the “green” (Green IT) and “digital” economy, mainly through its direct effects.

Keywords: *sustainable development, innovative society, information society, information technologies, “digital” economy, “green” economy*

1. Introduction

The time that is perpetuating now seems to be alert and lively. Obviously, surprising changes are taking place. Environmental management has acquired the status of one of the most priority and acute problems of the humanity. It is quite difficult to keep pace with economic growth and at the same time to reduce the negative impact on the environment. Today, in the modern world, innovations are not simply linked to the capabilities of digital technologies, but are also largely based on them, which makes it possible to increase the pace of economic development with minimal impact on the social and natural environment. If we look closely at the events, probably the most important event that has occurred during the last century is the use of electricity in all spheres of activity. Electricity as a physical phenomenon was widely understood throughout the nineteenth century, and it has become widely used since the beginning of the 1900s. Undoubtedly, we can say: “Without electricity the contemporary

Western civilization would rapidly and irremediably degrade” [1]. The concept of „sustainable development” means a way of using resources, a so-called „ pattern of use” that tends to respond to human needs simultaneously with the protection of the environment, so that these needs could be met not only now but also in the future. This concept was introduced by the Brundtland Commission, which thus offered the most cited definition of sustainability: “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [5]. From the perspective of the complexity and the difficulty of achieving sustainable development, it can be delineated by the unity in the dynamics of several dimensions of development: ecological, economic, technical-technological, social-human, political, cultural, legislative and spatial (national, regional and global). Nowadays, digital and “green” economies are the leading technologies of the modern era and the future. In this regard, today, the solution of the issue of the priority and interrelation of such areas as digital technologies or the “green” economy is relevant and non-alternative.

The era of knowledge and the post-industrial concept of the industrial revolution (Industry 4.0) served as an “introduction” to cyber systems in 2011. These systems, that will come together, will be a network, they will fluently interact with each other, they will be configured and they will develop new behaviors, including the direction of sustainable development. The networks will help reduce errors in the production process, interact with manufactured goods and adapt to the needs of new consumers (Industry 5.0 - 7.0). In this way, there is a need for the interaction of the innovative, informational society and the “green” economy. The synergistic notion of Industry 4.0 provides for the digitization of all physical assets and their integration into the digital ecosystem, together with the partners involved in the value chain of the “green” economy. The notion of digitizing the economy by integrating sensors into the components of products and equipment, manufacturing processes, use of cyber systems, analyzing data, requires innovative offers. Sustainable development involves a complex cohesion of the three components - economy, society and environment. The term “green economy” that started several decades ago is meant to establish a harmonious state between the components that would be satisfactory for all groups of countries - developed, in transition, in development and countries with emerging economies.

2. Level of scientific development of the problem at present and the aim of the research

Initially, in 1991, there were discussions about the characteristics of age differences depending on preferences (Americans William Strauss and Neil Howe, in researching *Generations: The History of America’s Future*, 1992). Subsequently, a theory was developed, based on the differences in the values of different generations. These differences, as well as their causes, were studied in comparison with the correlation of economy and politics with the technological development of the society. After some time, the theory began to be put into practice, as it proved to be very effective in business. Currently, this theory is frequently applied. Generation theory based on age includes three main components (X, Y and Z generations) and one additional component (baby boomers) [19]. The transformation of the economic environment, supported by intelligent, cutting-edge technologies, includes the

integration of sensors, equipment, products and IT networks into a single system throughout the life cycle chain, both within an entity and in the micro- and macroeconomic environment. The basic criteria of Industry 4.0 are the integration of the physical elements of production and information systems for the development and use of cyber systems in sustainable production. The green economy, described in the UNEP Report 2011, perceives this evolution as an improvement in the social and economic status, along with a significant reduction in the environmental risks [2].

According to the authors, the factors that impede the implementation of sustainable technologies in the modern information society are:

- the large volume of information to be collected, selected, and classified;
- the territorial gap between object surveillance and decision making;
- the difference in the hierarchical structure of subordination;
- the wide variety of domains and subdivisions that solve small parts of a major problem;
- the need to make some decisions, carry out operational control, without bureaucratic delay.

The first processes of automation of environmental protection started in the 1990s of the twentieth century. The first IT programs were based on SAP EHSM (Environmental Health and Safety Management), SAP EC, Industrial Security, and Microsoft Dynamics AX, Oracle.

The first use of the term “green” and “digital” economy belongs to the American art historian Paul Fussell. In his book, “A Guide Through the American Status System“, the author identifies (Generation X -1963 - 1983, Generation Y - 1983-2003, Generation Z - after 2003). Obviously, the visions and interpretations of values are different describing the morals of modern society. Paul Fussell represents persons who are alienated from the society, rejecting the status it offers (without identification with their own generation) [17]. In 1991, writer Douglas Coupland took over the title of the novel, extending Fussell’s portrait to the whole generation [16, pp. 40-41; 17]. The book, conceived as a story, presents the memories of three strangers of approximately the same age, united in their desire to distance themselves from society, in order to better understand their purpose. The phrase had been used previously, but with a different meaning. Thus, in the United Kingdom of the 1960s, the authors Charles Hamblett and Jane Deverson gathered a number of interviews with young members of the Mod subcultures in the book entitled “Generation X” (1965). Those interviewed were under the age of 25, and were therefore born in the 1940s [17]. Nicholas Negroponte, Don Tapscott and others dealt with the emergence of the research, development stages, pros and cons of the “digital economy” [16]. David Pierce, Edward Barbier, Enil Markandia and N.V. Pakhomova, V.I. Samarukh, A.K. Tulokhonov, T.A. Akimov [16, pp. 40-41] are the leading scientists in the study of the “green economy”.

The aim of the research is to study the impact of information technologies on the “green” economy, focusing on the most efficient use of resources.

3. Applied methods and materials

In order to study the influence of IT and the information society on the “green” economy, the following aspects were considered: specialized literature, reports of the international

organizations, different scientific papers and statistical database. At the same time, the authors analyzed five significant indicators over a period of time, such as: the population growth; the impact of the 4.0 revolution; the effects of pollution; the demand for food; the incidence of diminution and degradation of natural resources, which highlights the characteristic of the state of the green economy, as well as the direction of the application of the innovative potential, including in the IT sphere, aiming at the sustainable future. The main methods of research used were: analysis, comparison, induction, deduction, forecasting, graphical extrapolation, methods and techniques of formalization and systematization of information, static and dynamic method, used in the GMES Global supervision of environment and security program [8], named after the mathematician Nikolai Copernicus (2008), which uses satellites to monitor the state of the soil, aquatic spaces, atmospheric phenomena with an effect on human health.

4. Results and discussion

The authors' research shows that information technologies have achieved remarkable development in the USA. Hardware and software have been developed by the Silicon Valley Toxics Coalition (CTCD), which include the Earth pollution data. The satellite sensors offer us the possibilities of administration, manipulation, investigation and provision of the information with spatial reference in order to solve the complex problems of planning, forecasting and management, to obtain clear images, related to the environmental changes, natural disasters, fires in tropical forests (Brazil, 2019) and in Russian forests, floods (recently in Spain), the ozone layer, the location of renewable energy areas, and the "green" economy. It is worth mentioning the joint project of UNESCO and ESA (European Space Agency), Wildlife Fund (WWF), which unites 22 member countries, on saving objects from the list of the World Cultural Heritage in three centers - Noordwijk (Netherlands), Darmstadt (Germany) and Frascati (Italy). Unique opportunities for comprehensive information monitoring and operation are a true tool capable of providing data for making the right decisions. The ability to process huge spatial information is tailored to ICT systems and generations Z, as reported by Forbes [11; 23].

People from generation Z are looking forward and are of interest (Table 1). On the contrary, the older people are not interested in providing ideas and innovations [21].

Table 1. The Specificity of Generation Z [17]

Characteristics	Past generations	Generation Z
Access to the Internet and information	A privilege	A fundamental right
Influence	Bought	Won
Intellectual property / patents	Value creators	Breaking patterns and barriers
Failures	Avoided	Accepted with opening
Plays	The do not bring value	Essential pillar to increase engagement
Uncertainty	Adaptive behavior	Anticipatory and proactive behaviour
Withdrawal from professional life	An objective	A travelling
Connectivity	A luxury ("I")	A fundamental need (from "me" to "us")

Harvard Business Review reports that the average age of entrepreneurs and founders with startups, valued at over 1 billion USD, is 20-24 and 30-34 years old - about 75% of staff [3; 25; 27].

The industrial performances of the last decades are the pillars of the great success in technology, computerization, medicine, education and daily life. Information and innovation associations (e-trade, e-government, e-medicine, e-learning, e-banking) and other similar applications in the sphere of IT and ICT are the driving forces of economic development, which may change the state of affairs. It is noteworthy that, at the moment, only developed countries benefit from the most technological discoveries. According to the authors, it is equally notable that the lives of 80% of the population of countries in transition and developing countries will be changed for the better with the help information and communication technologies [16, pp. 40-41].

Digital technologies play an important role in achieving a long-term sustainable balance between the technosphere and the natural environment, necessary for the upward development. The innovation company is ready for major changes. The information association and the digital economy open new opportunities, which, of course, have a positive impact on the life of the community or persons. Currently, there is no single explanation for the digital economy. In the modern world, the concept of the digital economy is identified with such terms as “information economy” (the 1970s), “knowledge economy” and “online economy” (the 1980s), “new economy” (the 1990s) or “network economy” and “internet economy” (the 2000s). The analysis of the publications on the concept of “digital economy” clearly showed that there is no single accurate interpretation and this led to the formation of our own ideas on this subject [9, pp. 115-128; 16, pp. 40-41]. Digital economy is an activity based on the development and use of digital information technology in economic, social and cultural systems. The first aspect analyzed by the author is dedicated to industrialization – environmental pollution and global production.

The main concept of the digital economy is the production of goods and services, but ongoing training and innovation are possible through the transfer and computerized processing of modern technologies in the framework of global trade and sustainable development. Thanks to the development of digital technologies, the consumer can quickly benefit from the services he needs, save money by buying goods in online stores at lower prices and can even start his/her own online business, becoming an entrepreneur without leaving home or the cafe (Teleworking) etc. We will mention that, in modern economy, microelectronics, as a key factor in the rapid and significant reduction in relative costs, ensures a safe and unlimited offer for long periods of time; it offers, independently or in combination with other factors, the potential for creating other products and values in conditions of an innovation society and global economy. Figure 1 shows the dynamics of waste transfers from industrial installations, with the exception of the waste industry. The IT application allows the monitoring of the waste path in order to optimize the “green” economy. The RFID program allows the monitoring of each waste disposal car. The use of drones in Pretoria Kenji Suzuki allows monitoring of waste, illegal waste ramps and promoting the “green” economy [28].

It can be seen that the highest values of waste shipments, especially non-hazardous waste, are recorded by such industries as energy, iron and steel, followed by the extractive industry and the food and beverage business; non-ferrous metals record the lowest values. Regarding the

harmful waste, the chemical substances, the energy supply, the iron and steel sector, the non-ferrous metals and other industries, register the highest values; the lowest values are found in the food and beverage sector.

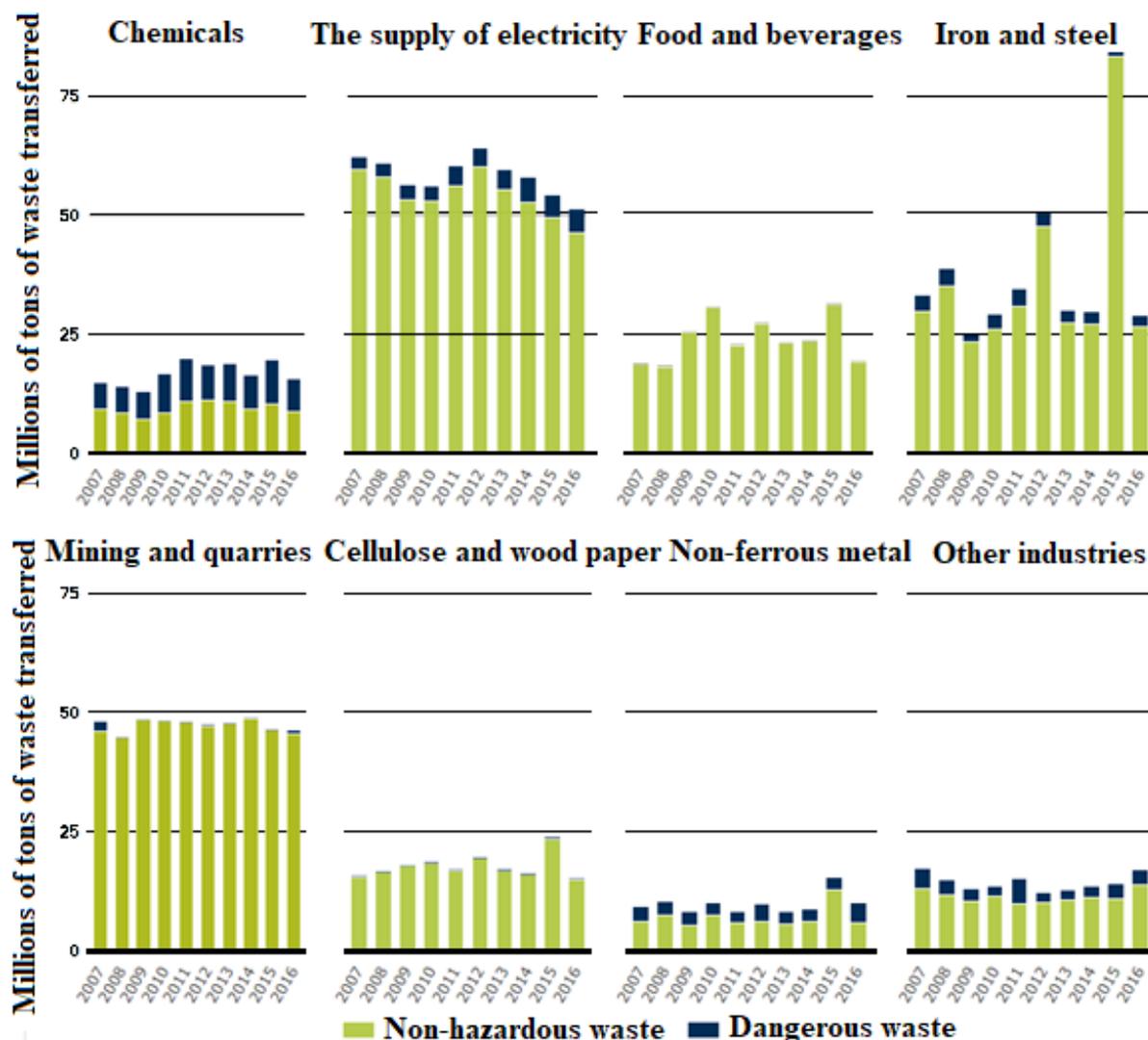


Figure 1. Transfers of Waste from Industrial Installations, with the Exception of the Recycling Industry, EEA-33 [7]

The parameters that characterize the “green” economy (degradation of natural resources) are the demand for food, the number of the population and the energetic and polluting efforts to produce food. Improving the standards of living of the population (along with the polarization of incomes) leads to the depletion of resources, reduction of renewable sources, use of new energy sources for the production and use / recycling of waste (Figure 2).

According to figure 4, in the period 1961-2000 the population grew by 98%; food production increased by 146%; the yields - by more than twice, and the arable land in use - by 8%; agricultural inputs also increased, such as: nitrogen fertilizers - 7 times; phosphate fertilizer - 3 times and irrigation water - twice. At the same time, the latest forecast shows a 71% increase in the demand for food, an increase of 127 x 10¹⁵ kcal by 2050 [4].

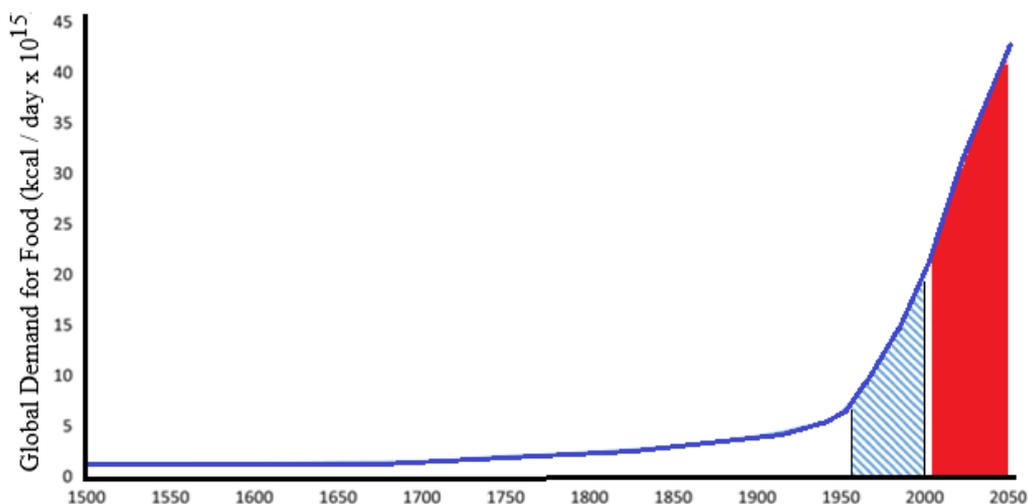


Figure 2. Global Demand for Food (kcal / day x 10¹⁵) [22]

The World Bank, in its 2016 Digital Dividend review, includes other benefits of developing the digital economy:

- increasing productivity;
- improving the competitiveness of companies;
- lower production costs;
- creating employment opportunities in the labor sphere;
- tackling poverty and social inequality.

Moreover, these are just some of the cracks in the digital economy that have a beneficial effect on our lives, providing many opportunities for the average user and, therefore, expanding the capabilities of the market itself [6, pp. 523-528]. In the information society and digital economy, particular attention should be paid to environmental issues, as they are essential for sustainable development. In the modern world, the contribution of science, innovation and new technologies is a decisive factor in the social and economic development. Due to their help, the volume of products, goods, services and their diversity are constantly growing. At the same time, a huge amount of primary resources and energy is used, which negatively affects the environment. The significance of the industrial revolution 4.0, the fifth and seventh, leads to technologies and intelligent equipment, cutting-edge technologies. The evolution of the process can be seen in Figure 3. The impact of human influence on the Earth is determined by human ingenuity and intuition, fortified by technical equipment. The development of mankind has required the creation of comfortable conditions for existence, which changes in parallel with the progress of human thinking, but frequently through the degradation of the environment.

Sustainable evolution is mainly related to the conservation of the biosphere and natural wealth, along with the technologies and the social field. At the same time, in ordinal life, ecological issues are often not given due attention.

The progressive use of resources leads to their impoverishment and exhaustion. The second aspect analyzed is based on the tendency of exhaustion of natural wealth. Figure 3 will show the global prices of goods. The use of economic leverage can diminish conflicts and contradictions in the commodity market (Figure 4).

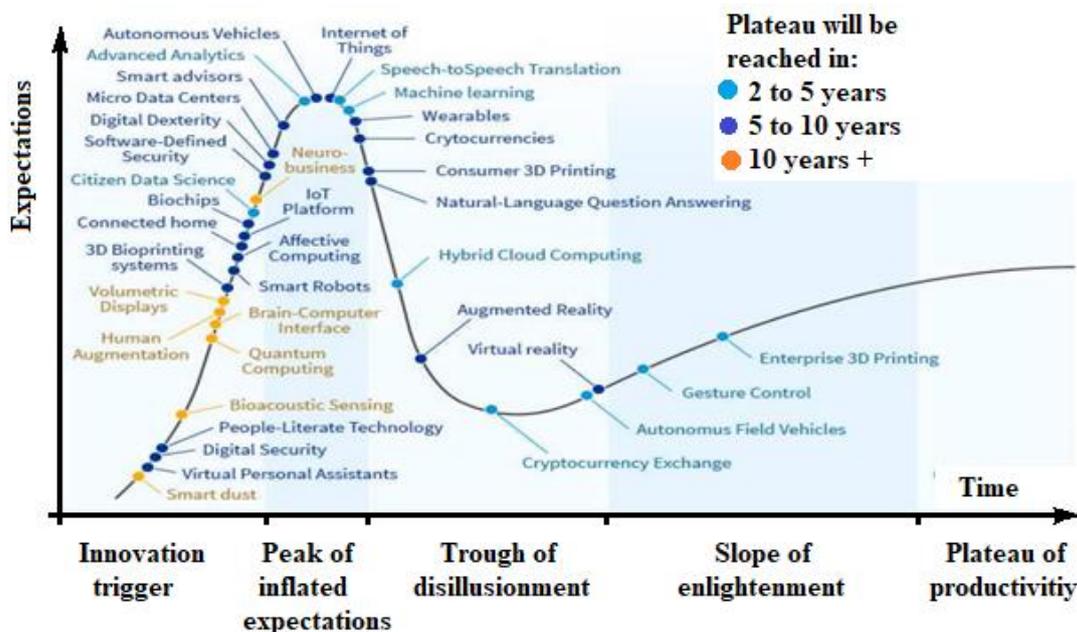


Figure 3. Evolution of New Societies and Technologies [1; 10, pp. 91-99; 17; 20]

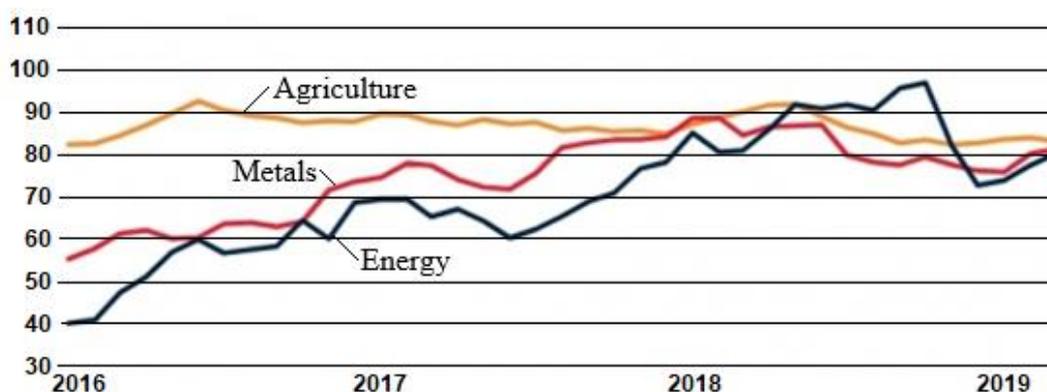


Figure 4. Global Prices of Raw Materials (agriculture, energy, metals), 2016-2019 [13]

In the first quarter of 2019, the prices for most commodities increased after the last year’s decline, and many of them recovered from the decline of Q4, 2018. Energy prices fell in 2019, with low coal and natural gas prices, while oil prices have risen slightly. Prices for non-energy sources grew in the first quarter. Most metal prices have recovered due to a decrease in the fourth quarter of 2018, due to the China’s prospect of growth and supply blockage. Prices for agricultural products increased fairly on smaller plantations in the first quarter.

There have been changes in the formation of national economies lately, in this case regarding the consolidation of the ecological constituent. Decreasing the cost of sensing technologies and spreading IT networks allows connecting each component included in the production process. The data gathered through such links offer the possibility to find out the provenance of the product, the method of production and the quantity of energy consumed. The information obtained gives businesses, cities and countries the opportunity to renew, form and allocate these resources more efficiently. It is suggested to consider the impact of the digital economy on the environment. Digital and green economies are today the leading technologies of the future. Considering what a digital economy represents, let us think about what a “green

economy” means, to understand which the main direction is and which the secondary one is. At the Rio + 20 State Conference, the term of “green economy” was created as an important tool for sustainable development. The concept of “green economy” is a pattern that leads to the growth of the welfare of the population, health and social justice, to a significant reduction of the dangerous impact on the environment [6, pp. 523-528]. Digital Moldova 2020 Strategy offers the right vector, the route, the direction of ensuring a consistent evolution of the information technology space.

In its most modest form, the “green economy” is seen as a low-carbon economic model that saves resources and includes the social economy. According to the classification of the Organization for Economic Cooperation and Development (OECD), “green” technologies cover the following areas: environmental management (waste management, water control, air pollution, restoring forests, land, etc.); energy generation from alternative sources (wind energy, solar energy, biofuels) and energy efficiency in buildings and lighting devices, in fact, “green” technologies comprise all sectors of the economy: energy, industry, transport, construction, agriculture, etc. They are introduced throughout the entire activity chain of companies, including production, consumption, management and production organization methods. The key area of research for “green” technologies is energy. Its “green” directions are increasing energy efficiency and developing new energy sources, especially renewable ones. The benefits of introducing “green” technologies include, primarily, improving the environment and human health, saving resources, increasing production efficiency and product competitiveness. The concept of ecological economy does not substitute the concept of sustainable development. Nowadays, it is frequently recognized that achieving sustainability depends almost entirely on the formation of a “fair” economy. According to the paradigms of the last decades, the company has obtained new wealth based on a non-ecological model of the “brown” economy. Sustainability remains the most important objective, but in order to achieve it, the world economy must become “green”.

The Republic of Moldova has implemented the priorities of the provisions of the Final Declaration of the UN Conference on Sustainable Development – “The future we want” (Rio de Janeiro, June 20-22, 2012) in the National Development Strategy “Moldova 2020” [18]. Through this, the Government of the Republic of Moldova has committed to make greater efforts to ensure a transition to the “green” economic development, which would promote the principles of sustainable development and thereby contribute to poverty reduction, through better governance, by integrating aspects related to environmental protection in all areas of the socio-economic development.

“Green” economic policies help developing countries achieve social and economic benefits (by introducing green energy technologies, improving resource efficiency, using more sustainable agricultural practices). Based on the above-mentioned aspects, it can be concluded that the expansion of the “green economy” cannot be achieved without digital IT technologies, which is a priority direction in all areas, including the environment, which can reduce and even eliminate the negative impact on the environment. The planning of an economic activity based on an automated system will contribute to the reduction of transport costs and transactions, to the redistribution of labor resources, which will ultimately have an impact on reducing environmental pollution, on the more active advancement of the “green economy”.

One of the mentioned parameters (degradation of natural resources and environment) is population growth (Figure 5). To illustrate the dynamics of population growth, we will present it with pessimistic and optimistic forecasts. The population growth creates the problem of food, waste, energy, material resources, and green spaces.

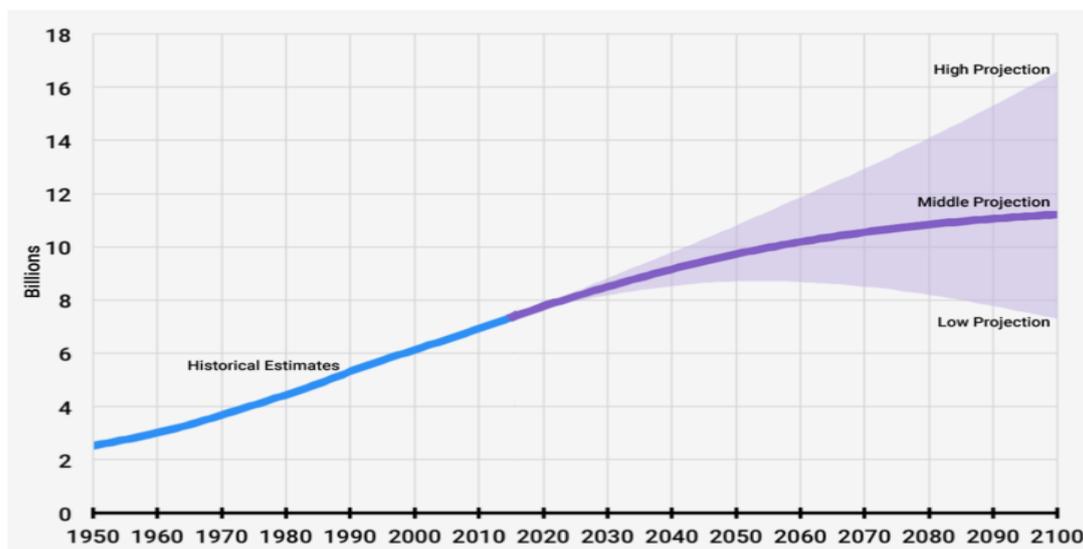


Figure 5. Projections of World Population [24]

The responsibility for society and the environment should not only be the focus of developed countries, but other states as well. We should think about how we can save energy and raw materials; find solutions on how consumers can clean the environment of the harmful effects of waste and production, how to create healthier products without pollution, etc. Successful rethinking of economic activity requires innovation and competitiveness [26]. To solve most of the environmental problems in the modern world, we need new “green” technologies, “smart” management models, improving the quality of environmental analyses, reducing waste and emissions and maximizing the reuse of resources. Large companies are increasingly considering innovative projects, integrating ecological solutions into their operations and creating products for emerging “green” markets. Today there are numerous conferences, exhibitions, forums on the modern “digital” economy, using the technologies of the “green” economy. An example of this kind could be the exhibition-forum Ecotech-2017 organized by “Deloitte” and named “Digital economy” [9, pp. 115-128].

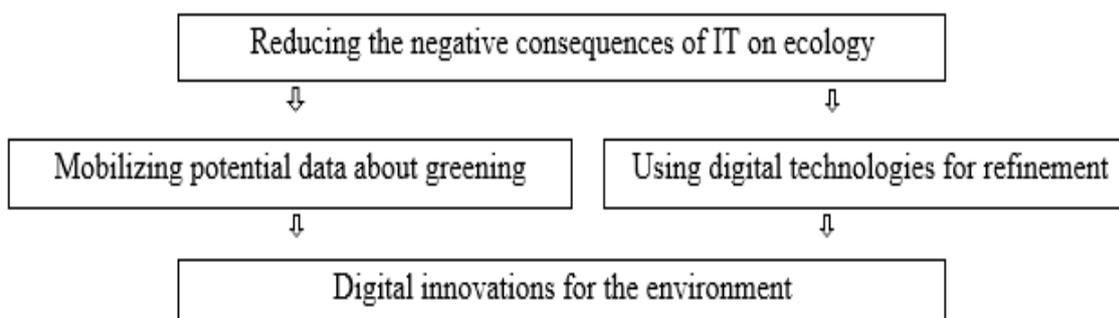


Figure 6. The Scheme of the Interaction of the Digital Economy and the “Green Economy” to Achieve Synergy [authors’ research]

The Energy and Biomass project in Moldova aims to foster the creation of a stable, consolidated, competitive and sustainable process for generating energy from alternative sources, in this case, biogas, pellets, biomass from waste and other materials. The project aims to facilitate the generation and consumption of cheap and clean energy in public structures, private households, urban and rural areas [14].

The construction of a new FIFA stadium for the 2022 FIFA World Cup has recently started in Qatar. The specific feature of this stadium is the intelligent cooling system of the building through new, efficient evaporation technologies, using a new architectural design, with minimal electricity consumption. At the end of construction, the stadium will be used by the surrounding residential areas for cooling. The construction corporation and the author of the project, Tangram Gulf, will endow the stadium with smart technologies to save traditional energy [15]. This finding is related to the cohesion of smart technologies (IT monitoring and equipment management in Qatar, a country with high temperatures). The applied technologies are designed to restore the state of the “green” economy, arguing the direction of the innovative vector for the future. The digital economy changes the human relations with the “green” economy, and with the environment. The concept of “sustainable digital economy” highlights the attitude change towards the environment and the social and economic benefit. All international organizations and developed countries have accepted synergies between the digital economy and the “green” economy. Without great alternatives, there is a strong belief that ICTs will contribute to the development of the ecological economy in three ways:

1. Reducing the direct adverse impact on industry, agriculture, distribution by using ICT, with repercussions on renewable energy, new renewable materials and technologies.
2. Improving the efficiency of ICT use for the development of the “green economy”, increasing productivity, making logistics more efficient and applying the final product. Reducing energy demand and the use of environmentally friendly materials by replacing polluting products and harmful technologies.
3. Applying measures with impact on the behavior of producers and consumers, and on social values. The field of ICT, in cooperation with other structures, is highlighted as a decisive factor in shaping the image of the environment [6, pp. 523-528]. Overcoming environmental problems nowadays, according to the authors, will be possible only with the use of the digital economy, technologies and smart installations with a synergetic effect (Figure 6).

Lately, IT companies are increasingly interested in the “green economy”, particularly the “green energy” and other green industrial solutions. Apple is expanding its innovations in China’s energy, and Panasonic is actively working with Tesla.

5. Conclusions

Humanity, in the hope and longing for a better life, produces goods on an exponential scale, which, as a result, leads to the depletion of energy resources, the unprecedented pollution of nature and ecumene. For some time, nature was opposed to the major stream of waste, but an exponential increase in production leads to the inability of nature to regenerate waste. New strategies and policies are needed to monitor processes throughout the entire product cycle

(from projection to recycling). Taking advantage of the Industry 4.0 revolution and IT projects gives hope to improve the situation. In order to reduce harmful emissions into the environment, many companies have chosen the path of an improved production model, which has been called “advanced manufacturing”. The concept is characterized by the use of new secure materials and intelligent systems, in particular, robotics and wireless sensor networks. Exploring the synergies between the “green” and digital economies can provide a joint decision with long-term implications. Reducing the negative consequences and mobilizing the potential for greening data will lead to the compulsory use of digital innovations for the environment in any area of human activity. The problem of implementing a digital economy project requires an integrated approach. In addition, the ecology cannot remain outside this problem, since the implementation of the main economic activity depends largely on the welfare of the environment [12]. Such systems process the real-time data received from sensors (terrestrial or spatial) and interact with the production control elements. The digital economy should rise to a new level by moving to the management of real economic processes, which will greatly facilitate environmental control and will proceed from “manual control” to the automated one. Automated systems, based on IT, respond to the smallest fluctuations in environmental indicators, warning staff about possible accidents and problem situations, analyzing the efficiency of the equipment use, estimating the level of environmental pollution and the amount of waste generated. The environmental authority must ensure that all relevant information about the environmental impact of the endowment with new technology and decommissioning stages reaches the public sphere and can be accessed without restriction by any factor. The use of IT technologies will reduce greenhouse gas emissions by 15% by 2020 through the use of cyber programs (GeSI) and building smart homes. “Green” energy will be based on solar and wind energy sources. In Denmark, they have already announced that, by 2040, they will ban the use of petrol and diesel cars. Tesla Motors is making progress in this area. IT brands are recognized for maintaining their image by their involvement in the “green” economy.

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Rezumat

Prezenta cercetare este dedicată interacțiunii dintre tehnologiile informaționale și economia „ecologică”. În secolul al XXI-lea tehnologiile informaționale contribuie la dezvoltarea economiei „verzi”. Principalele inovații se fac prin utilizarea tehnologiilor informaționale în contextul dezvoltării lor durabile. Sustenabilitatea este calitatea unei activități antropice desfășurate, fără a epuiza resursele disponibile, fără a

distruge mediul și fără a compromite posibilitățile de a satisface nevoile generației următoare. Metodele și materialele utilizate în lucrare sunt următoarele: analiza grafică, metodele și tehnicile de formalizare și sistematizare a informațiilor, metoda statistică și dinamică. În același timp, autorii au studiat mai mulți indicatori semnificativi într-o perioadă de timp: creșterea populației; impactul industrializării; efectele poluării; cererea de produse alimentare; tendințele de epuizare a resurselor naturale în vederea studierii impactului tehnologiilor informaționale asupra economiei „verzi”. În sinteză, autorii au determinat interacțiunea dintre economia „verde” (Green IT) și cea „digitală” prin efectele sale directe.

Cuvinte-cheie: dezvoltare sustenabilă, societate inovațională, societate informațională, tehnologii informaționale, economie „digitală”, economie „verde”

Аннотация

Данное исследование посвящено взаимодействию информационных технологий и «зеленой» экономики. В 21 веке информационные технологии способствуют развитию «зеленой» экономики. Основные нововведения заключаются в использовании информационных технологий в контексте их устойчивого развития. Устойчивость - это качество антропогенной деятельности, осуществляемой без истощения имеющихся ресурсов, без разрушения окружающей среды и без ущерба для возможностей удовлетворения потребностей следующего поколения. Методы и материалы, используемые в работе: графический анализ, методы и приемы формализации и систематизации информации, статистический и динамический методы. В то же время авторы изучили несколько значимых показателей за определенный период времени: рост населения; влияние индустриализации; последствия загрязнения; спрос на продукты питания; тенденции истощения природных ресурсов для изучения влияния информационных технологий на «зеленую» экономику. В результате авторы определили взаимодействие между «зеленой» (Green IT) и «цифровой» экономикой, в основном через ее прямые эффекты.

Ключевые слова: устойчивое развитие, инновационное общество, информационное общество, информационные технологии, «цифровая» экономика, «зеленая» экономика

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