

The IM (Possible) Transition Towards the Digital Economy in Bulgaria

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“Quality is like water – doesn’t stand unadulterated” F. Idriz

And speed is the most irreplaceable quality as Aristotle said: **“Well begun - is half done.”**

Abstract

Undoubtedly, the business has been fast moving to the next technological generation of Industry 5.0 based on accession of digital and social instruments in techniques across all business processes and activities. Thus, the next business winners already have been accepted not just digitalization but virtualization and socialization of the business.

Taking into account current and future state of the Bulgarian companies, they are called to digitalized for keeping their role at the existing value chains. But, are they look to be prepared for such transition from digital production (Industry 3.5) to digital company (Industry 4.0).

The paper examines how far to digital companies are Bulgarian ones. The structure of the paper is: 1. The future of world economy and 2030th business development; 2. Limitation of Bulgarian economy for 2030 running backward of the European one; 3. Guidelines that helps Bulgarian companies

to move fast for their digitalization and socialization.

Keywords: digital economy, Industry 2030, Industry 4.0

JEL: D04, O14, O44

Introduction

The particular focus in the Bulgarian economic development has been the establishment of a competitive economy for the last more than twenty years. Despite the huge amount of money “poured” into the economy via different schemes and mechanisms of the Operational programme *Innovations and Competitiveness* (in the different variations of the programme from 2007 until now), the Bulgarian economy cannot yet be described as strongly developed or competitive.

At the same time, the world economy, including the European one, competes in the field of internet and digital technologies. New supply chains are being established, the majority of which surpass Bulgaria. Even the development of different “industrial zones” is not capable of solving the main issues which the Bulgarian economy faces at the beginning of the 3rd decade of the 21st century.

Additionally, the COVID 19 crisis has driven up the development of internet and digital technologies, and has ensured a

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lasting transformation of the international supply chains.

The paper considers the tendencies in the development of the world economy and brings to the forefront the yet unsolved tasks of the transition towards digital economy in Bulgaria. The main recommendations are towards the national level of economic management and scientific organizations, as well as universities, which we consider to be in the basis of solving this problem.

1. Development of the world economy 2030

In the last two or three years, except the 2020 COVID health, social and economic crisis, there are three leading tendencies which drive the world economy:

A. The development of the online community and the fast transition from Industry 3.0 to Industry 5.0

Without going into details about the transition from a conventional industrial

society (towards the end of the 20th century) towards the modern digital society (present), we should say that the development of technology, including sharing information via internet and cloud services, led to an unprecedented change in the world economy. The world has never been so close (on one click away). Nevertheless, the main industrial principles (which led to the third industrial revolution) - specialization, cooperation and combination - take on a whole new meaning. The main tools through which these principles are displayed in the digital world are based on: artificial intelligence (AI), smart advertisements, smart programmes and applications, virtual working spaces. Along with them, the combination of the digital society and the digital communications leads to making first steps in the “collective business intelligence”, artificial business networking, digital (self) consciousness (table 1)

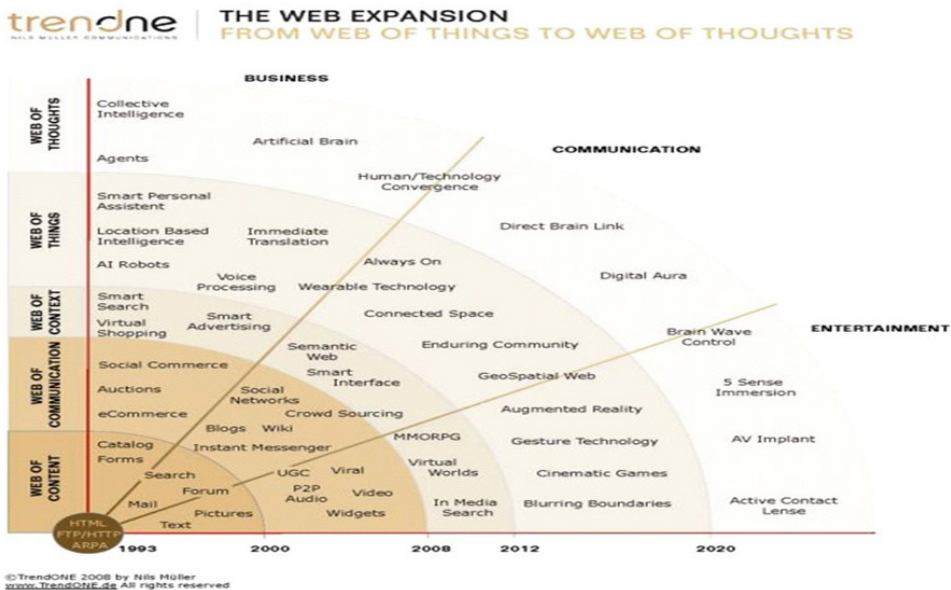


Table 1: Development of the digital technologies and their use in economy.

Source: TrendOne, <https://trendone.com/en.html>

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Taking into account the above, the presence or absence of the world digital business networks is equal to the presence/absence from the future economic life. Furthermore, it is the tools of the artificial intelligence and the collective business intelligence that pose new challenges in front of the realizations of the principles of cooperation and combination, and add the questions “Is it possible”, is it ethical for business to hide from the digital world. The answer to these questions is controversial and it is connected to solving moral dilemmas about the right to choose in some cases.

B. Development of circular and/or regenerative economy

The protection of the environment is a main challenge and an environmental protection stands in the way of the intensive economic

growth. The limitations which arise from the dilemma between cheap and ecological production cannot be solved without the adoption of suitable controlling mechanisms.

The reason is again in the transition from industrial to neo-industrial society. The typical industrial society of the 20th century creates growth through the use of unlimited natural resources. Modern climate changes bring forward not so much the scarcity of the natural resources, but of resources like water and air, which are key to the existence of society. Hence, the growth of the theory of recycling of the already used substances from the 1980s. Despite the numerous international agreements (such as the Kyoto agreement and others), the depletion of the critical for the society resources is still going strong. This leads to several restrictions which bring the traditional industrial society into obsolescence.

Table 1: Linear economy model Vs. Circular economy model

Linear Economy (LE)	Circular Economy (CE)
Excessive (over) consumption	Sustainable consumption
Unsatisfactory management of waste	Wasteless production
Depletion of resources	Optimization of resources
Ecological imbalance	Ecological balance

Source: Author's systematization

The business model which applies to the regenerative economy can be demonstrated in Table 2.

Table 2: 9R business model of the circular economy

Smarter product use and manufacture	R0 Refuse	Make a product redundant by abandoning its function or by offering the same function with a radically different product
	R1 Rethink	Make a product use more intensive (for example by sharing the product)
	R2 Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials

Extended lifespan of the materials	R3 Reuse	Reuse by another consumer of discarded product which is still in good condition and fulfils its original function
	R4 Repair	Repair and maintenance of a defective product so it can be used with its original function
	R5 Refurbish	Restore an old product and bring it up to date
	R6 Remanufacture	Use parts of the discarded product in a new product with the same function
	R7 Repurpose	Use discarded product or its parts in a new product with a different function
Useful application of materials	R8 Recycle	Process materials to obtain the same (high grade) or lower (low grade) quality
	R9 Recover	Incineration of material with energy recovery

Source: adapted from Potting et al. (2017, p.5) cited B Kirchherr et al. (2017)

Due to the challenges cited above, the impossibility of the establishment of smart products corresponds to the impossibility of the business to be an effective and important part of the world supply chains. Furthermore, the concentration of the business and the efforts to reach only effectiveness of the used resources and materials is a prerequisite for the business to participate in the first phases of the world production of services which leads to a realization of low added value and sales at low prices.

C. The development of an innovative and entrepreneurial society

The innovations and the human resources (as far as innovativeness is a characteristic of individuals) are a leading concept for the development and growth of the economy since the end of the 20th century. The method of perception of innovations and the role of the human factor in business growth has changed throughout the years.

Despite the fact that leading business organizations (including in Bulgaria) make an allowance for creating individualism and creativeness in their human resources, the main generator of innovations remains

society. It is not a coincidence that during the last 10 years there is a boom in the establishment of different communities, including a financial one, which encourages the innovative element inherent in individuals. With this in mind, numerous funds for flexible financing, funds for collective financing and a network of business patrons who are ready to share their finances, experience and skills, in order to help the development of a new and prosperous business were launched.

And this leads to a change in the understanding of the main industrial principles: specialization, cooperation and combination, which when applied to the modern tools of development and innovation are connected to the assimilation of the "sharing game". Thus, the main challenges facing the development of the innovative entrepreneurial business with growth potential can be measured.

- Among the main business goals is the assumption of an investment/business risk; market experiments; production flexibility and business adaptability.
- They are created as a result of the establishment of an attractive field of innovative business as a result of the implementation of errands from a

renowned and large-scale business model.

- They operate in an unpredictable and unstable business field, meaning at the edge of the existing market, and often overleaping it (Blue Ocean strategy).
- They do not make additional efforts to make the field more stable or to influence it.
- Their innovativeness is based on the development of a single innovative business idea.
- This business is not a smaller version of the already existing bigger companies, but rather their alternative. Quite frequently they have been described as David versus Goliath.
- Usually this business does not have the necessary resources and is ready to be part of sharing economy and it has troubles to obtain the missing finances, managerial and organizational experience and knowledge, technical and technological skills, market skills, etc.

2. The Bulgarian economy in the pursuit of the Economy 2030 goals

The state of the Bulgarian economy is visible in each of the three stated directions.

A. Digitalization of the business

Despite the fact that Bulgaria self-identifies itself as a leading country in regards to digitalization due to the presence of leading specialists in the field of informative and computer technologies, the Bulgarian business, and not only, is yet considerably far away from the implementation of the requirements of the digital society of Industry 5.0

An example is the extent of the use of different digital technologies by Bulgarian business:

Table 3: Use of digital tools by the business in Bulgaria

		Relative proportion (%)
Personal internet webpage	YES	72
	NO	28
Personal social media page	YES	36
	NO	65
2D or 3D visualization of the company and its products	YES	3
	NO	97
Business intelligence in online environment	YES	62
	NO	38

Source: Author's systematization

The data shows that although the Bulgarian business is ready to search for information in the digital world, it is not often willing to share the information with others. Furthermore, for many Bulgarian entrepreneurs, undisputed public data is treated as a company secret, which obstructs the implementation of the digital world in the modern business.

B. Circular economy and Bulgarian business

By analyzing the data about Bulgarian companies, the following can be determined:

- Only 0.46 lev from the increase of gross domestic product (GDP) are based on the change with 1 lev of the added value of sectors from the Circular economy. The coefficient of dependence is less than 1 lev, so in summarization it can be said that the Bulgarian economy is not circular enough and the added value of the circular economy sectors are not sufficient to implement a growth in GDP at the national level.

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- A main component of the sectors of the circular economy is waste recycling. It is a basic level for fulfilling the circular economy's main indicators and it is the result of activities in the separate collection of the county's waste. The commerce with recycled goods and materials has very little influence.
- A comparative analysis of the data in the EU shows that Bulgaria is at the bottom of the implementation of the criteria for circular economy in comparison with the other members of the EU.

C. Innovation and entrepreneurship in Bulgarian economy

One of the main strategic documents in the country, which dictates the possibilities of development for an intelligent and innovative

business is the Innovation Strategy for Smart Specialization (ISSS). The outlined goals of which are:

- Encouragement to share innovations and accept and spread of innovation ideas.
- Strengthening of ties between regional innovation ecosystems and national priorities.
- Making the smart specialization more responsible towards technological changes and industrial development.
- Turning the smart specialization into a source of intensive growth.

Despite the presence of a strategic orientation and the fact that there are examples of successful innovative companies in Bulgaria, the country is still recognized as having an average innovative potential (Table 4).

Table 4: Innovation index of Bulgaria

Indicator	Value	Indicator for Bulgaria	Place / 141
Research and development	0–100	35.4	51
Scientific publications	220.7	80.0	52
Patents per 1million population	4.40	31.0	44
Research costs as a % of GDP	0.8	26.0	49
Development of research institutions	0.02	4.5	55

Source: Global Competitiveness Report for 2019, WEF_TheGlobalCompetitivenessReport2019.pdf (weforum.org)

Analogous are the indicators for 2020, which place Bulgaria in the last place in regards to innovative capacity with a score of 2.9 points out of 7 and in regards to having competitive advantages - a score of 3.2 out of 7 points.

The reasons behind the scores can be found in the non-implementation of the main directions of ISSS

- A significant component in ISSS is the sharing of knowledge, which is not being realized. Many of the tools for

such sharing - open science, open business, connection between business and universities, are either do not function or do not function effectively. The main scientific studies are still being conducted in the institutes of the Bulgarian Academy of Science and in some separate research universities in the country.

- Another main element is the sharing of best practices which is partially implemented via the programme for

student internships. Many universities, as well as businesses, are not open to joint educational initiatives. Very often the description of a “best practice” is being taken to mean sharing strongly guarded company secrets and in the course of education there are not available good examples from practice, which are quite many.

- The 3rd element of the system “infrastructural coherence” has not been built. The concentration on research infrastructure through The Bulgarian Academy of Science and SofiaTech Park is in the capital. This means that the businesses in other places cannot rely on an “appropriate” scientific research support. Even though the National Plan for Recovery and Resistance has to provide a mechanism for the creation of regional research centers, this “infrastructural coherence” is unlikely to happen anytime soon.

3. Guidelines for the transition from industrial to neo-industrial and digital economy

Analyzing the main omissions in achieving the priorities of the modern digital economy, two main ones can be outlined:

- There is a need for the increase of a “networking” type of work and transition towards a “sharing” economy. These networks have to lead to virtual hubs for innovations. The establishment of several elements of the modern business networking environment is recommended, such as:
 - Firstly, the research and educational systems - the universities and the research institutes of the Bulgarian Academy of Science respectively,

should share their knowledge outside the traditional publishing of books. The sharing of knowledge is connected to making a list of rights in regards to intellectual property, owned by the universities and research facilities, which can be marketed as business services.

- Secondly, applied sciences have to become more available for the public. As an example, chemistry is a main science and its application is part of everyday life, without the public realizing it. Similar examples can be given with physics, mathematics and the so called “fundamental” sciences, which are considered complicated and unusable, but are part of everyday life.
- Thirdly, shared education means encouragement of networking between teachers and researchers who work in different fields and can contribute to the popularization of science and its marketing

There is a need for the development of entrepreneurial-based education starting from primary and pre-school education, through primary and secondary education, to higher education. Although there is an introduced subject “Entrepreneurship and technology” in the primary and middle course of education, the development of entrepreneurship culture is a never ending process, which starts from basic education and continues until the end of higher education. The establishment of an appropriate entrepreneurship culture is not a zone, separated by certain entrepreneurial boundaries – this is a fee zone of the type “Open doors” which creates:

- Social skills for students who spend a lot of time working in social groups;
- A facilitated mechanism for the acquisition of transversal skills through the “sharing”

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- of physical and psychological energy with others;
- Conditions for lowering the aggression and achieving a higher degree of empathy through the acquisition of skills for problem solving and management of teams at an early age to developed people in universities;
 - Specific communication skills, which lead to encouraging collaboration and teamwork;
 - More important is that it creates an entrepreneur spirit, for which the sky is the limit, at an early age.

Conclusion

Undoubtedly one of the most important aspects associated with the Bulgarian growth and development is the adoption of preconditions for the pursuit of economic growth. Regardless of the known delay in the transition from an industrial economy to digital economy, it seems as if this transition could possibly take place by the year 2030. For this purpose, however, there are challenges that require changes in a number of strategic national documents, projects and mechanisms, which are to establish the following prerequisites for this transition.

The most important among the prerequisites that are required to “unlock” the transition towards the digital economy can be summed up as follows:

- Sharing of knowledge from universities and research centers.
- Sharing information from the business.
- Orientation of the research in the universities and research centers towards resolving applied business problems through the creation of networks of universities and research centers for education and research.
- Orientation of the priority sectors towards the primary industries and encouraging the incorporation of applied results from basic sciences like mathematics, chemistry, physics, material science etc. for the development of the industries 4.0 and 5.0.
- A very important element of the 21st century is that quality and quality implementation in a timely manner of any pre-project and project studies will lead to a guaranteed successful outcome.

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