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WIRTSCHAFTSTHEORIE, MAKRO- UND REGIONALWIRTSCHAFT

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DIGITAL TRANSFORMATION OF THE ECONOMY: TRENDS AND FORECASTS¹

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Digital transformation has become one of the main factors determining the development of modern economies. Since the beginning of the computer revolution, which began in the middle of the 20th century, the world has experienced a series of technological changes that have directly affected various aspects of economic life. Thanks to the rapid growth of computing power, the increase in the number of Internet users and the development of new technologies, countries have been able not only to increase their economic efficiency but also to create new opportunities for the development of social sectors. This process is interdependent: technology stimulates economic growth, and the economy, in turn, provides opportunities for further innovation. In this context, it is important to examine the main trends of digital transformation and their impact on global economic development to understand what changes are expected in the coming decades.

To identify current trends in the digital transformation of the economy, let's analyse the following indicators. The first one is the computing power of computers, which is measured in the number of transistors on a processor chip [1]. This indicator is an identifier of productivity. Its larger number allows you to perform more complex calculations and process more data. The second indicator is the number of Internet users, which shows not only the prevalence of communication tools but also characterises the level of digital development in the country [2]. A

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larger number of Internet users is characteristic of economically developed and developing countries, which also confirms the level of well-being of the population and the creation of new opportunities to improve the social level. To compare digital transformations, the GDP per capita indicator was chosen, which shows the economic development of countries, their well-being, and social development [3]. This indicator is sensitive to digital transformations, as it also considers the development trends of the IT sector in countries.

The data were selected as averaged over every 10 years, starting from the 1970s and ending in the 2020s. The results are presented in Figure 1, where you can see a completely positive trend for the growth of computer productivity, Internet users and GDP per capita. To forecast them, the graph also contains trend lines showing the 5 following periods. The number of processors and Internet users is growing exponentially. At the same time, the growth in the number of users is especially noticeable after the 1990s, when the Internet began to gain popularity. High values of the coefficients of the determination indicate the high quality of their trend models, which indicates sufficiently high-quality forecasts that confirm the growth of digital transformations over the next 50 years. The red line shows the linear growth of global GDP per capita from the 1970s to the 2020s, which indicates its stable but less rapid growth compared to technological indicators.

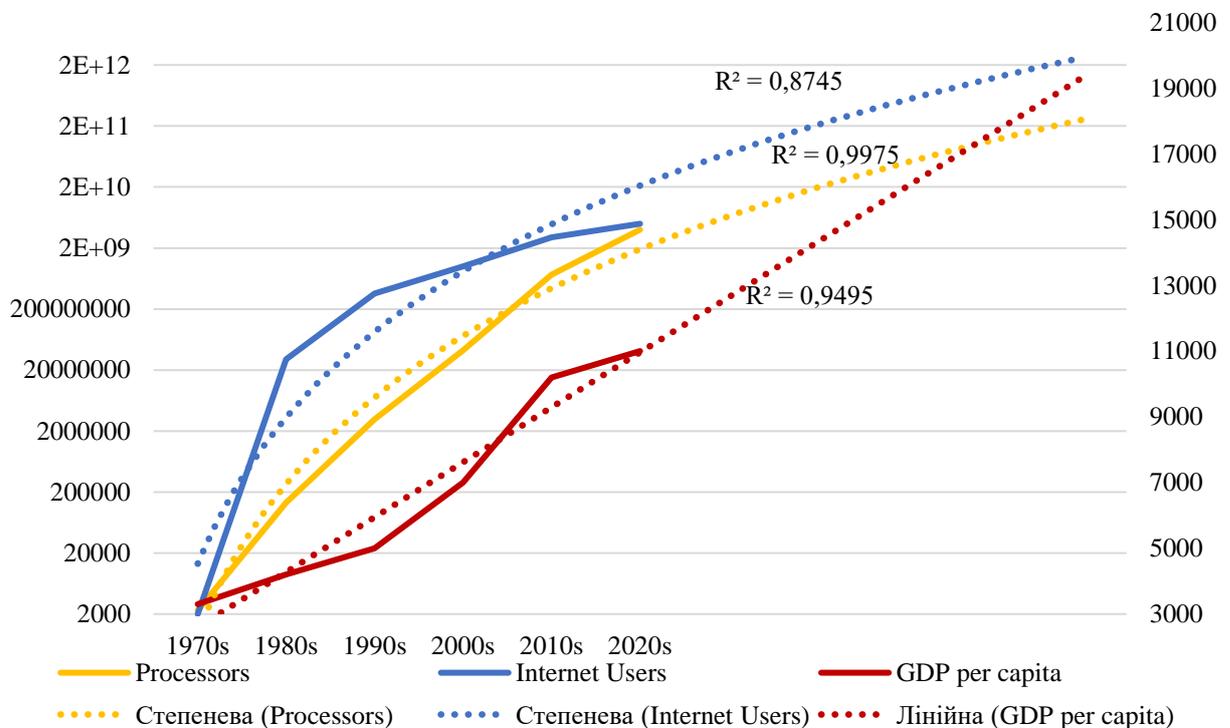


Fig. 1. Trends and forecasts of digital and economic transformations

Data was calculated based on [1-3]

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The results of Figure 1 allow us to conclude that over the past 50 years, there has been rapid technological growth, which is characteristic of global technological revolutions. The market is rapidly becoming saturated, which also affects the economy. Over time, the pace of technological development may slow down, and they will not create the corresponding effects for economic growth.

To confirm this result, pairwise correlation coefficients were calculated, the results of which are presented in Table 1. They confirm the presence of a very strong relationship between computer performance and Internet users, between GDP per capita and Internet users, as well as a strong one between computer power and GDP per capita. This indicates that technology can be a driver of powerful economic development, which in turn can stimulate a technological breakthrough.

Table 1

Value of correlation coefficients between pairs of indicators

Indicators	Processors	Internet Users	GDP per capita
Processors	1	-	-
Internet Users	0,915066222	1	-
GDP per capita	0,756371108	0,950467354	1

Data was calculated based on [1-3]

Thus, over the past 50 years, there has been a rapid growth of digital transformations, and this is most clearly reflected in indicators such as the number of processors and Internet users, which are showing exponential growth. Together with the steady growth of GDP per capita, this indicates that technology not only improves computer performance and access to information technologies but can also stimulate economic development, increasing the population's well-being and creating new growth opportunities.

In the future, however, the pace of technological growth may slow down due to the achievement of certain physical and economic limits to the development of modern technologies. For example, reaching the limits of chip miniaturization may decrease the growth rate of computer processing power. It means that new sources of innovation will need to be found to stimulate economic growth, such as artificial intelligence, quantum technologies, or improvements in Internet infrastructure.

Prospects also include the growth of digital technologies in areas such as automation, blockchain, and augmented reality, which can transform manufacturing processes, reduce costs, and foster the creation of new economic sectors. In such an environment, countries that invest in digital infrastructure and technology will have a chance to remain leaders in the global economy. Overall,

while technological progress is the main driver of economic development today, over time it will be important to promote more equitable development of technologies and ensure their accessibility to different countries and segments of the population, which will be the key to sustainable growth in the future.

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