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TECHNOLOGY DEVELOPMENT AND CREATIVE DESTRUCTION: CHALLENGES FOR DIGITAL TRANSFORMATION OF THE ENTREPRENEURSHIP, WORK AND EDUCATION

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Abstract

Purpose. Digital transformation varies in different countries. Therefore, the aim of this paper is to specifically analyze how these changes have occurred in large and small countries and to point out differences in the impact of new technologies on digital entrepreneurship, work modalities and education and to examine the connection between creative destruction, new technologies and digital entrepreneurship.

Design/methodology/approach. By systematically reviewing and analyzing a variety of scientific literature, the results of the latest research and indicators that indicate the development of this dynamic field, we perform a comparative analysis between small and large countries and identify differences and similarities between them. We selected Baltic countries in our study because they are exemplary barometers for innovation and digital entrepreneurship development. In addition, we selected three other countries because of their similarities - Slovenia, North Macedonia and Cyprus. All three countries are relatively small in terms of population and economic size, which allows them to be agile and quickly adopt innovative solutions. In this regard, we also considered China and Japan as two large countries that are at the forefront of innovation and digital entrepreneurship. We compared them from several different angles in order to highlight their specificities. We put all the specificities and comparable results of small and large countries in the context of creative destruction, artificial intelligence, new work modalities, and new knowledge, in order to

point out their interdependence.

Findings. Collaboration between the public and private sectors is a common strategy in both small and large countries to drive innovation and support digital entrepreneurship. Both small and large countries emphasize education and skills development, particularly in STEM fields, to create a skilled workforce that can drive innovation. In addition, both types of countries recognize the importance of digital transformation and invest in digital infrastructure, technologies, and skills to stay competitive in the global innovation landscape. At last, whatever the technological future holds it will be defined by continuous adaptation, perpetual innovation, and the search for new potential. Departing from these observations, this study seeks to add the global perspective to the already lively debate on possible changes that may result in the labour markets as a consequence of the recent advent of generative AI.Small countries are struggling to build a robust AI ecosystem amid the prevailing global dominance of the United States and China. Our findings also highlight the potentially different growth dynamics among countries with lower GDP levels and different levels of digital skills. Policymakers should act to mitigate these risks. A drastic shift towards rapid improvements in productivity growth and investment in education and skills development will reduce these disparities.

Research implications. The specificity of this research is that there are no similar considerations in the literature. Mostly they are concerned with pointing out the differences between rich and poor countries, but not taking into account economies of scale and wealth of resources. Therefore, we think that this study will give a new perspective on this important and current issue. The findings emphasize the significance of AI which penetrates every sphere of human life. In line with this, it is imperative for policy makers to formulate roadmap to see the opportunities and identify its likely threats. In addition, ethical considerations are vital for creating AI systems that benefit society while minimizing harm. Policymakers should act to mitigate these risks. A drastic shift towards rapid improvements in productivity growth and investment in education and skills development will reduce these disparities.

Keywords: Schumpeter's creative destruction theory, Artificial intelligence, digital transformation, digital entrepreneurship, digital entrepreneurship Index (DEI), creative destruction, innovation, workforce

JEL Classification: 031; O33; 038

1. Introduction

There are notable differences between small and large countries in terms of technological development and creative destruction. Small countries often have limited resources,

which can constrain their ability to invest in research and development (R&D). They may rely more on importing technology from larger countries. Often have more flexible and adaptive regulatory environments, which can facilitate the process of creative destruction. May experience more rapid and visible effects of creative destruction due to their smaller economies. However, creative destruction occurs on a larger scale, with more firms entering and existing the market. Accordingly, digital transformation varies in different countries. For these reasons, the aim of this paper is to specifically analyze how these changes have occurred in large and small countries and to point out differences in the impact of new technologies on digital entrepreneurship, work modalities and education. Namely, the aim of this paper is to show that digital transformation is driven by the evolution of artificial intelligence and digital technology. It also aims to examine the connection between creative destruction, new technologies and digital entrepreneurship.

2. Theoretical Review

Schumpeterian theory (1942) of creative destruction suggests that technological innovation is the driving force behind economic growth. Many economists argue that creative destruction is essential for long-term economic growth. It encourages businesses to innovate and adapt, driving productivity gains and overall prosperity (Garcia-Macia, Hsieh, Klenow, 2017). Namely,new technologies disrupt existing markets and business models, leading to the replacement of old industries with new ones, ultimately fostering economic progress (Kopp, 2023).The application of new technologies often leads to creative destruction. Namely, creative disruption and technological lag can be significant challenges in the digital era for many countries regardless of their size. Creative disruption refers to the innovative changes and transformations that occur when new technologies and business models disrupt existing industries and markets. While this can lead to growth and innovation, it can also create economic and social disparities. Technological lag occurs when some countries or regions struggle to adopt new digital technologies and adapt them to the existing business environment (Radović-Marković, et.al. 2025). The reasons can be multiple. This can be due to factors such as inadequate infrastructure, limited access to education and training, or regulatory barriers. To address these challenges, countries need to invest in digital infrastructure, promote digital literacy and skills development, and create enabling regulatory environments. Bridging technological gaps and fostering creative disruption can help countries thrive in the digital era, while minimizing potential negative consequences.

In today's time of great challenges for entrepreneurs, it is especially important to manage knowledge and adapt it to the business environment, which is a key aspect of business sustainability in the context of digital transformation (Radović-Marković, et.al. 2022).Current research illustrates the importance of digitalization in higher education that a lot of effort is being devoted into furthering the work methods and communication among students

and professors, aimed at bettering the quality of this kind of studying (Radović-Marković, 2023; Radović-Marković, et.al., 2021; Radović-Marković, 2023a). In this context, managers, creative leaders, can use a wide range of new, technologically supported options in formulating their strategies. They are increasingly using it in business to meet changes, not just react to them.

Based on strategic documents related to the development of education until 2030, the development of digital skills in higher education is promoted (OECD, 2025). On the other hand, the demand for labor in the labor market is characterized as competitive, dynamic, risky, complex and interdisciplinary. Therefore, it is necessary for higher education to enable individuals to organize their acquaintance with such an environment and prepare them with the relevant skills, knowledge, ethics and attributes to succeed in it. Our research conducted in Western Balkans showed that digital skills are becoming an important prerequisite for employment, but a significant portion of the population still lacks the skills needed to function in a digital business circumstance (Radović-Marković and Djukanović, 2022). Accordingly, digital technologies should transform the retraining landscape by making learning more accessible, personalized, and adaptable to the needs of individuals and industries, promoting a lifelong learning mindset (Radović-Marković, 2025).

There are many companies that are using AI in the current world. According to a report by Fast Company, some of the most innovative companies in AI include OpenAI, DeepMind, Nvidia, Builder.ai, Voxel, and others (Ufberg, 2023). IMARC Group has made a list of the top 17 artificial intelligence companies in the world, including Amazon Web Services Inc., Apple Inc., Baidu, Cisco Systems Inc., Facebook Inc., General Electric Company, Google LLC (Alphabet Inc.), International Business Machines, Intel Corporation, Micron Technology Inc., Microsoft Corporation, Nvidia Corporation, Oracle Corporation, Rockwell Automation Inc., Samsung Electronics Co. and many other. These technologies have the potential to revolutionize various industries, creating both opportunities and challenges. Adaptation, regulation, and ethical considerations will play a key role in how creative destruction unfolds in the coming years.

The future of the process of creative destruction is likely to continue to be shaped by new technologies such as artificial intelligence, automation, blockchain, and biotechnology. At the first place, artificial intelligence (AI) is significantly transforming the world today, resulting in major changes in the economy, labor market, education, and social dynamics (Gupta, 2024). Artificial Intelligence (AI) has the potential to make a significant impact on the economy and society.AI can increase the efficiency with which things are done, vastly improve the decision-making process by analyzing large amounts of data, and spawn the creation of new products and services, markets, and industries, thereby boosting consumer demand and generating new revenue streams. According to a report by PriceWaterhouseCoopers, AI technologies could increase global GDP by $15.7 trillion, a full 14%, by 2030 (West and Allen, 2018). According to a report by the McKinsey Global Institute (2018), leading countries could capture an additional 20 to 25% in net economic benefits compared with today, while developing countries may capture only about 5 to 15% .

3. Creative Distruction and Economic Growth

The recent empirical evidence supporting the Schumpeterian view that the process of creative destruction is a major phenomenon at the core of economic growth in market economies (Caballero, 2008). Namely, according to Caballero (2008), Creative destruction involves the continuous replacement of old products, processes, and business models with new and more efficient ones and contributes to GDP growth. Real GDP growth for the Asia region fell markedly at the beginning of the COVID-19 pandemic (Fig 1).

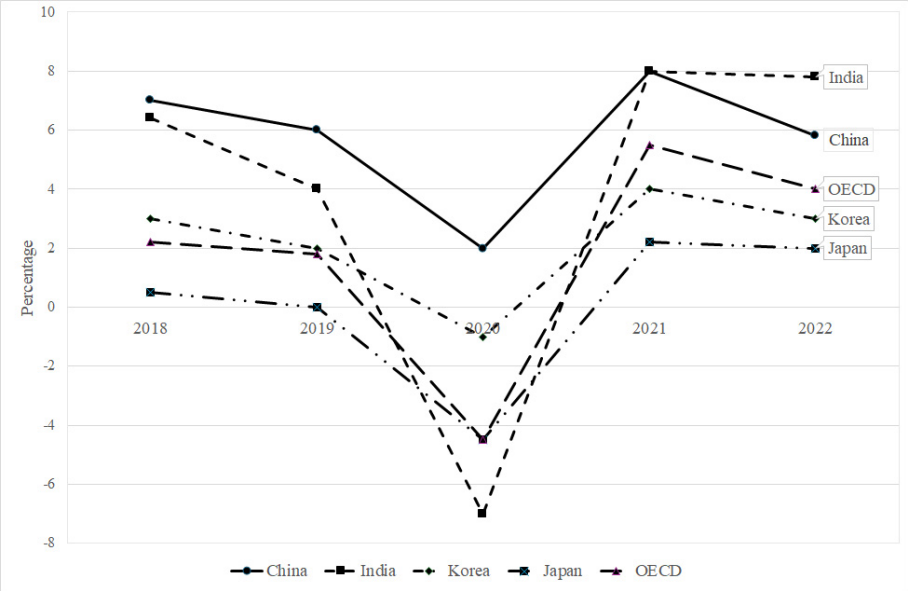

Fig.1 Countries experienced a decline in GDP growth with the outbreak of the COVID-19 pandemic (Note: e = estimate; f = forecast).

Source: Preparing according to World Bank (2021), World Development Indicators

According to a report by Boston Consulting Group (BCG), Bangladesh has been experiencing an average annual GDP growth of 6.4% between 2016 and 2021, outpacing Asian peers such as India, Indonesia, and the Philippines, and performing significantly better than the global average of 2.9% (Munir, et. al.,2023). The country's GDP per capita was ~$2,800 in 2022, which is already higher than India's (Munir, et. al.,2023). This report also highlights that Bangladesh has a large domestic consumer market, a rapidly expanding middle and affluent class, and an impressive digital adoption rate, which are driving the country's growth (Radović Marković, 2025).

We can note that China's GDP per capita growth rate in 2022 is projected to be significantly lower, while Japan's is projected to be slightly lower than in 2017, just before the

outbreak of the COVID-19 pandemic. At the same time, in Bangladesh, GDP growth per capita is higher in 2022 than in 2017 (Fig. 2.).

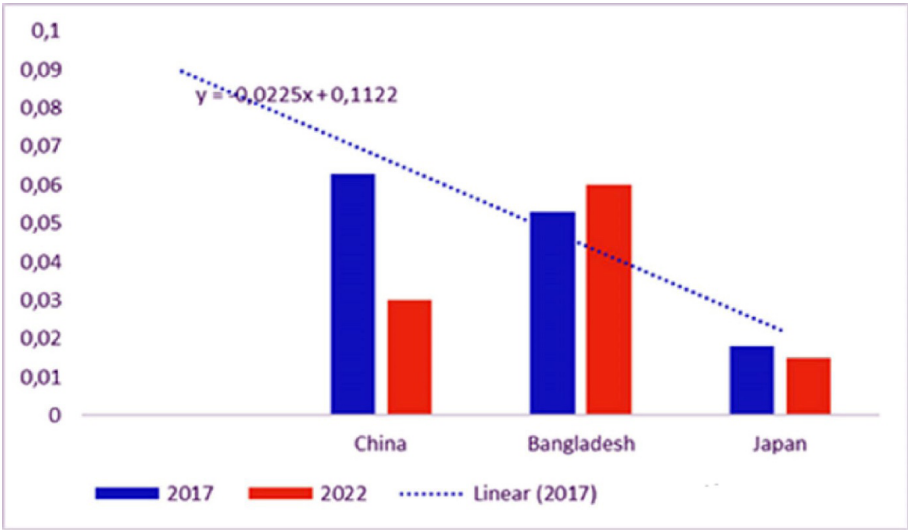

Fig.2. GDP per capita growth (annual %) - China, Bangladesh, Japan in 2022.
Source:Author acording to data of Statista , 2023.

Among the Baltic countries, Lithuania (Eurostat,2023) experienced the greatest growth in GDP per capita in 2022. Both Estonia and Latvia were well below Lithuania in this respect. the greatest growth in GDP per capita over the last five years. (Fig.3).

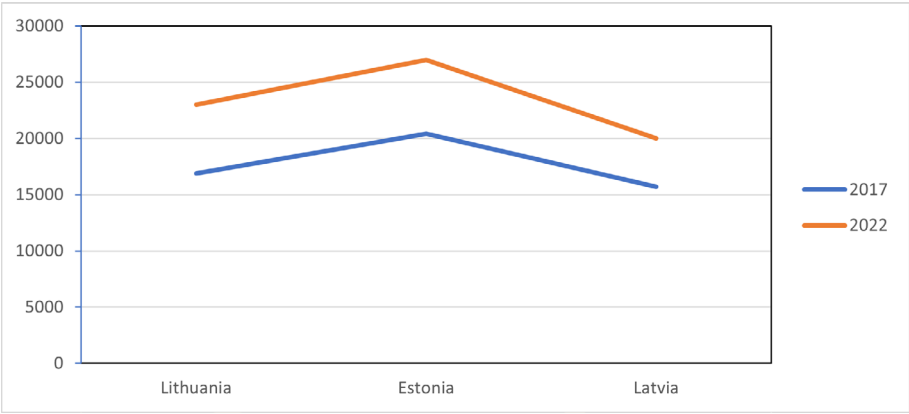

Fig.3. GDP per capita in the Baltic Countries , 2017-2022 ($ US)
Source:Author acording to data of Wold Bank , 2024.

Lithuania with a GDP of $53.4B ranked the 83rd largest economy in the world, while Estonia ranked 102nd with $30.7B. Lithuania's impressive GDP per capita growth because the country has implemented significant economic reforms, including tax reforms and improvements in the business environment, which have attracted foreign investments and boosted economic growth.In addition, the country has a well-diversified economy with strong sectors in manufacturing, services, and technology. This diversification has helped Lithuania weather economic fluctuations better than some of its neighbors.In this context, In addition, Lithuania has continued to increase its GDP per capita growth rate, i.e. from 2023 to 2024 by 5.09 percent (Georank, 2025).

It is important to note at the end of this part of the research that Lithuania, like other Baltic countries, has invested heavily in new technologies and artificial intelligence, which we will discuss in more detail below.

4. The Effects of Artificial Intelligence in Lithuania and other Small Countries

When it comes to the development of AI technologies, both factors—country size and wealth—can play significant roles, but they do so in different ways. The approach of national AI strategies differentiates these countries in several aspects, including scientific research, education, talent development, and ethics. To address their different needs and opportunities, countries have taken very different approaches. For example, China has outlined its plan for global dominance, which it has backed with massive investments. China aims to lead the world in artificial intelligence technology by 2030.

Current debates on Artificial Intelligence (AI) and jobs in most cases are focused on two opposing viewpoints: the optimists, who view new technology as the means to relieve workers from the most arduous tasks and replace manual work with more creative jobs, and the pessimists, who think that new jobs will increase the risk of mass unemployment. Departing from these observations, this study seeks to add the global perspective to the already lively debate on possible changes that may result in the labour markets as a consequence of the recent advent of generative AI.Small countries are struggling to build a robust AI ecosystem amid the prevailing global dominance of the United States and China. Namely, the United States and China lead in total private investment in artificial intelligence and the number of newly funded AI companies over the last decade (NetBase Quid, 2022).

Countries as small as Lithuania and as large as China have created or are working to create formal national AI frameworks that tackle the important questions AI raises for society, the economy and government. The Lithuanian government published the Lithuanian Artificial Intelligence Strategy in April 2019 with the main intention of expanding and modernizing the existing AI ecosystem in Lithuania and securing the future of artificial intelligence development. This strategy was updated in 2023, (EC-OECD 2025). In addition,

national artificial intelligence (AI) strategies provide more than 60 countries with a framework for developing and deploying AI technologies. (Vats et al.,2022). The Lithuanian AI strategy emphasizes the importance of AI education at all levels. This includes reforms to the primary and secondary education system to teach AI basics, as well as the introduction of AI-related courses in higher education. The strategy also highlights the need for lifelong learning opportunities and vocational training programs in AI.

Some Lithuanian AI companies and startups have gained international recognition (Lithuania, 2019). For example, Neurotechnology, a company established in the 1990s, is known for developing world-class biometric solutions and algorithms. Another company, Pixevia, created the first autonomous shop in Europe that operates without cash registers and cashiers.It is also necessary to add that Lithuania is actively developing its AI ecosystem, but it is not among the top-ranked countries in the AI Index. In other words, analyzing the most granted patents in AI per 100,000 inhabitants for the year 2022 (latest data), South Korea dominates with the 10.3, but Lithuania also found itself on that list as the fifteenth country in rank with 0.28. It is the only small country to make the list among those selected in this study, i.e. Estonia, Latvia, North Macedonia, Slovenia, Albania, Montenegro, Cyprus and Malta. In this context, Lithuania's efforts in AI development and investment are positioning the country as a promising player in the global AI landscape, (Invest Lithuania, 2020).

Recent research shows that small country policies that address the risks associated with the development and implementation of AI can also create a dynamic AI ecosystem that encourages experimentation and rapid adoption of the technology. In essence, both distinctions are important. However, it's also crucial to recognize that smaller or less wealthy countries can still make significant contributions to AI development through targeted investments, international collaborations, and by focusing on niche areas where they have a comparative advantage.

5. The Effects of Artificial Intelligence (Ai) on The Economy In China, Japan and Bangladesh

Among the ten leading countries in the world in the use of artificial intelligence (AI), Asian countries have a large share (Table 1). China and Japan stand out in particular, and India also occupies a high place. For the purposes of this research, the example of China and Japan was considered in particular.

Table 1. Top 10 Global AI Leaders (data as of 2023)

Rank	Country	Total Score
1	US	70.06
2	China	40.17
3	UK	27.21
4	India	25.54
5	UAE	22.72
6	France	22.54
7	South Korea	20.48
8	Germany	18.49
9	Japan	18.47
10	Singapore	18.15

Source: Global AI Vibrancy Rankings 2023, developed by Stanford University's Institute for Human-Centered AI

Also, the example of Bangladesh was taken, which is not ranked among the top ten countries, but is specific in the development of new technologies and artificial intelligence and is therefore taken for analysis. Namely, Bangladesh's approach to artificial intelligence (AI) is quite fascinating and unique for several reasons. Artificial Intelligence (AI) is a rapidly growing field in Bangladesh. This country is at the very beginning of using artificial intelligence. However, there is huge potential for using artificial intelligence Bangladesh has developed a comprehensive National Strategy for Artificial Intelligence, aiming to leverage AI for the country's digital transformation. This strategy focuses on integrating AI into various sectors to boost productivity and economic growth (Information and Communication Technology Division Government of the People's Republic of Bangladesh, 2020). According to the National Strategy for Artificial Intelligence Bangladesh report, Bangladesh is embracing AI for the digitalization of the nation. The digitization process started a decade earlier, and now AI would work as an accelerator.The report states that Bangladesh aims to transform itself into a technologically-advanced nation by 2030 and leverage ICT as a tool for sustainable development. The report also highlights that AI has a great impact on the economy as well as it offers substantial benefits.If repetitive tasks and the role of humans will be automated, this will increase GDP gain and improve labor productivity .

AI is being applied in various industries such as ride-sharing, natural language processing (NLP) for Bengali, ChatBots, booking hotels, buying air tickets, and real-time mapping, among others (Babu , 2021). According to a report by the Centre for Policy Dialogue, Bangladesh has set a developmental approach towards research and development, skilling and reskilling of AI workforce, data and digital infrastructure, ethics, data privacy, security and regulations, funding and accelerating AI start-ups, and industrialisation for AI technologies (Khatun and Nawrin, 2021).The report also highlights that AI can be used in

various domains, from farming to manufacturing, hospitality to healthcare, public services to professional services, judiciary to defence and others (Bari, 2021).

Artificial Intelligence (AI) is being used extensively in China, India, and Japan. In India, AI is being used in various sectors such as healthcare, finance, and education, among others. For instance, AI is being used to predict and prevent diseases, improve customer service, and enhance the quality of education (Pandit, 2021).China has 2,200 AI companies in the country, according to 2023 data. It has been investing heavily in artificial intelligence (AI) and aims to become the world leader in AI by 2030, (Eliott,2020). Therefore, the country is making rapid progress in AI research and local government spending on AI is estimated to be in the tens of billions of dollars.China's AI sector has seen outsized success, with Chinese companies producing the most accurate facial recognition technology (DeSmith, 2023). According to DeSmith (2023),the Chinese government is installing facial recognition equipment across entrances to many of its subway stations. Besides , China has made significant progress in various AI technologies, not only in face recognition, but also in voice recognition, intelligent robots, virtual reality, and driverless vehicles. These technologies are being widely used in fields such as education, medical care, science and technology, logistics, agriculture, and entertainment (The China accelerates AI development to build AI innovation center (The State Council the People`s Republic of China.,2024). Report conducted by Stanford University showed that China is at the forefront of AI development . It has also noted that the development of AI a national priority.The country is investing heavily in AI research and development, with the highest number of AI startups and the most significant number of AI patents in the world.The AI market size in China reached $12.9 billion by 2022 (Slotta,2023). China's approach to AI development serves as a case study for other countries, especially developing nations, on how to integrate AI and data into the economy effectively (WEF,2024).

The Japanese government has been actively promoting AI development through various initiatives. The Society 5.0 framework is a key policy that envisions a human-centered society powered by AI and other advanced technologies. This initiative aims to integrate cyberspace with physical space to create a sustainable and inclusive society (Ulma ,2024). Namely, Japan's AI ecosystem is built upon a unique combination of strategic economic positioning, market potential, world-class infrastructure, and robust government support. These factors collectively make Japan one of the most promising AI development and investment destinations. In Japan, AI and robotics are being used to solve social issues and achieve economic growth.For example, robots are being used to take on repetitive jobs in the manufacturing line, such as filling boxes or welding a car frame. Japan is also globally recognized as a leader in robotics, with companies like FANUC and SoftBank Robotics at the forefront of developing AI-powered robots for various industries (Ulma ,2024). According to Ulma (2024), despite the progress, Japan faces challenges in AI development, including data privacy and ethics, workforce issues, and regulatory landscape. In this context, although Japan has always been at the forefront of new technologies and robotization in the world, they continue to develop at a tremendous speed, finding application in both

professional and private life. Due to the shortage of labor due to its rapid aging, robots are increasingly replacing workers. So, for example, numerous robot cafes can be found in Japan. Each robot is controlled by a human. Using a phone, tablet, or even just eye-tracking technology, they can control their robots from anywhere in the world, speaking through them to communicate with customers and guide them through the cafe's floor space (Independent, 2025).

A recent study found that robots, with their improvements and potential to replace workers, will drive divergence between rich and poorer countries (Alonso,,et.al. 2020). It also notes that there is no formula for preventing divergence. Given the rapid pace of the robot revolution, poorer countries need to invest more urgently than ever in increasing overall productivity and skill levels so that their workforces are supplemented, not replaced, by robots. Such improvements are always beneficial, but the gains are stronger in the context of the artificial intelligence revolution.It is important to note that AI is not only taking over the routine back-office roles or blue-collar jobs but also threatening to pervade the cognitive domain that has traditionally been under human control for thousands of years (Bari,2021).As AI penetrates every sphere of human life, it is imperative for us to formulate roadmap to see the opportunities and identify its likely threats.In addition, ethical considerations are vital for creating AI systems that benefit society while minimizing harm. Therefore, organizations must prioritize transparency and fairness.

6. Innovation and Digital Entrepreneurship

Innovation and digital entrepreneurship are closely intertwined, creating a dynamic relationship that drives economic growth and technological progress. Namely, innovation is the foundation for digital entrepreneurship. Innovative ideas lead to new entrepreneurial ventures, which in turn drive further innovation through competition, collaboration and continuous improvement. Innovations in technology, such as artificial intelligence, blockchain and the Internet of Things (IoT), open new opportunities for entrepreneurs to develop innovative business models, products and services. For example, the emergence of cloud computing has enabled digital entrepreneurs to launch scalable online businesses without the need for significant upfront investments in physical infrastructure. By identifying market gaps and using digital tools, entrepreneurs create new solutions that can transform industries.

Innovation plays an essential role in organizational transformation. For a company to be successful in digital transformation, it must consider the development of many interconnected factors, such as business mobility, infrastructure, data security, customer service and the ability to constantly change and adapt (Radović Marković, 2025). The Global Innovation Index (GII) provides valuable insights into the innovation capabilities of various countries, and it has a significant relationship with digital entrepreneurship. Countries that rank high on the GII typically have a robust innovation ecosystem, which includes

strong research institutions, supportive government policies, and access to funding. This environment fosters digital entrepreneurship by providing the necessary resources and infrastructure for startups to thrive. High-ranking countries on the GII are often leaders in technological advancements.

Data availability and changes to the GII model framework influence in 2022 and 2024 -year comparisons of the GII rankings is presented in Fig.4.

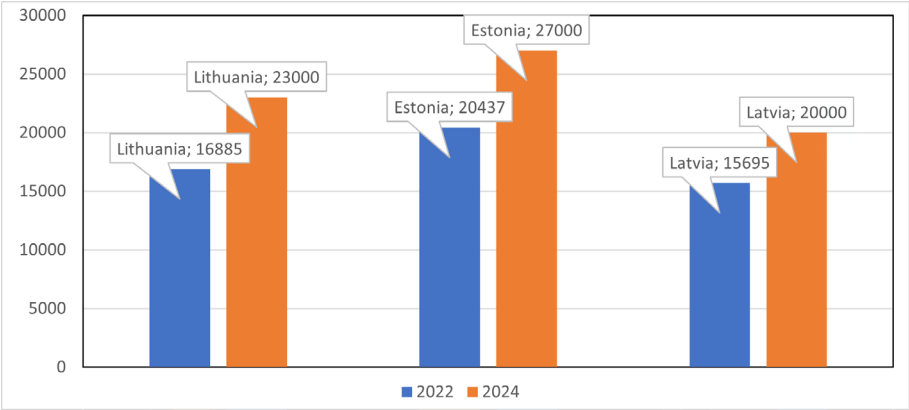

Fig.4. GII rankings, 2022-2024

Source: Global Innovation Index 2024

The Baltic countries—Estonia, Latvia, and Lithuania—can serve as barometers for innovation and digital entrepreneurship development. Macroeconomic stability provides a predictable and stable environment for businesses to operate and grow. This stability reduces uncertainty and encourages both local and foreign investments in innovative ventures. For these reasons, we will consider them separately.

Lithuania

Lithuania's position in the GII highlights its strengths and areas for improvement in fostering innovation and digital entrepreneurship. Namely, Lithuania ranks 35th in the Global Innovation Index (GII) 2024, (WIPO, 2024), while it was ranked 39th according to the GII 2022. This position is lower in 2024 than in 2021.This ranking reflects Lithuania's innovation capabilities across various dimensions, including innovation inputs and outputs. Lithuania ranks 30th in innovation inputs, which include factors such as institutions, human capital and research, infrastructure, market sophistication, and business sophistication. Lithuania performs well in areas like institutions and market sophistication, ranking 22nd and 28th, respectively in 2024 (WIPO ,2024 a).

Latvia

Latvia faces challenges in translating its investments into innovation outputs, as indicated by its lower ranking in this area. Latvia ranks 42nd in the Global Innovation Index (GII) 2024. (WIPO, 2024b). It is only ranked one position lower than it was two years ago. Latvia performs well in areas like infrastructure and creative outputs, ranking 33rd and 39th, respectively in 2024. Latvia ranks 46th in innovation outputs. This position is lower than two years ago. However, ranking 38th in innovation input last year is higher than in 2022.

Estonia

Estonia is the best ranked country among the Baltic countries. In this context, Estonia ranks 16th in the Global Innovation Index (GII) 2024, (WIPO, 2024c). Estonia performs well in areas like institutions and creative outputs, ranking 12th and 15th, respectively. Estonia ranked 14th in 2024 in innovation inputs, one place better than in 2022. According to available data (WIPO,2024d)., Estonia is ranked 16th in innovation outputs in 2024, which is six places better than in 2020. Estonia places a strong emphasis on education, particularly in STEM (science, technology, engineering, and mathematics) fields. This focus has resulted in a highly skilled workforce that contributes to the country's innovation.

We selected Baltic countries in our study because they are exemplary barometers for innovation and digital entrepreneurship development. Their successful strategies and initiatives can serve as models for other countries looking to foster similar growth. These countries have been pioneers in adopting and developing digital solutions. They have high internet penetration rates and advanced digital infrastructure, which are essential for the growth of digital entrepreneurship. This infrastructure supports the development and scaling of digital businesses. In line with this, these countries have implemented various government initiatives to support digital transformation and innovation, such as e-Estonia, which has made Estonia a leader in digital governance and services.The Baltic countries rank highly in terms of ease of doing business, with streamlined regulations and processes that make it easier for entrepreneurs to start and grow their businesses. There is a strong ecosystem for startups and innovation in the Baltic region, with numerous incubators, accelerators, and funding opportunities available to digital entrepreneurs. The relatively small size of the Baltic countries allows them to be agile and quickly adopt innovative solutions, making them ideal testing grounds for new technologies and business models.

We also selected three other countries because of their similarities. All three countries are relatively small in terms of population and economic size, which allows them to be agile and quickly adopt innovative solutions. Each country has government initiatives and policies aimed at fostering innovation and digital entrepreneurship. They provide support through grants, tax incentives, and infrastructure development. Slovenia, Cyprus, and North Macedonia have favorable business environments with streamlined regulations and

processes that make it easier for entrepreneurs to start and grow their businesses. These countries actively participate in international collaborations and partnerships to access resources, knowledge, and markets that can enhance their innovative ecosystems. All three countries emphasize education and skills development, particularly in STEM fields, to create a skilled workforce that can drive innovation.

In addition to the Baltic countries, several other small countries are included in our analysis. The broader picture is presented in Table 2.

Slovenia

Slovenia's position in the GII highlights its strengths in human capital and research, while other small European countries may excel in different areas such as digital infrastructure, market sophistication, or business sophistication. Each country has unique strengths and challenges that shape its innovative landscape. Slovenia ranks 34th in the Global Innovation Index (GII) 2024, and its performance can be compared to other small European countries to highlight differences and similarities (WIPO,2024d). For example, Slovenia and Cyprus have similar strengths, but Cyprus performs better in market sophistication. Slovenia performs well in human capital and research but lags behind Estonia in digital infrastructure and e-governance. Slovenia and Lithuania have similar rankings, but Slovenia performs better in human capital and research, while Lithuania excels in market sophistication.

Table 2. GII Rankings, (2022-2024)

Country	GII Position	GII Position
	2022	2024
Lithuania	39	35
Latvia	41	42
Estonia	18	16
Slovenia	33	34
Nort Macedonia	66	58
Cyprus	27	27
China	11	11
Japan	13	13

Source: Global Innovation Index 2024

Cyprus

Cyprus ranks 27th in the Global Innovation Index (GII) 2024 (WIPO,2024e). Cyprus has the same GII position in the two observed years. While Cyprus ranks 35th in innovation inputs, which include factors such as institutions, human capital and research, infrastructure, market sophistication, and business sophistication, this country ranks 17th in innovation outputs, which encompass knowledge and technology outputs, as well as creative outputs. Cyprus performs exceptionally well in areas like mobile app creation, cultural and creative services exports, and ICT services exports, all ranking 1st (WIPO, 2024 e).

North Macedonia

North Macedonia ranks 58th in the Global Innovation Index (GII) 2024. North Macedonia's position in the GII highlights its strengths in infrastructure and business sophistication, while also indicating areas for improvement in human capital and research. Namely, it ranks highest in Infrastructure (43rd), Business Sophistication (52nd), and Knowledge and technology outputs (53rd) (WIPO,2024f). The country ranks lower in Human capital and research (77th), Institutions (75th), and Creative outputs (72nd).

Finally, it can be concluded that among all mentioned small countries, Estonia has the best ranking in the Global Innovation Index (GII) 2024, positioned at 16th. This can be explained by the fact that Estonia is renowned for its advanced digital infrastructure and e-governance initiatives, such as the e-Estonia program, which has made digital services accessible to all citizens and businesses. In addition, Estonia has a robust innovation ecosystem with strong support from the government, research institutions, and private sector. This ecosystem fosters collaboration and knowledge sharing, driving further innovation.

In this regard, we will also consider two large countries that are at the forefront of innovation and digital entrepreneurship. We have singled them out in this paper and compared them from several different angles in order to highlight their specificities. China and Japan are all experiencing growth in their digital economies. This growth is driven by increasing internet penetration, the adoption of digital technologies, and the rise of digital entrepreneurship. China excels in innovation outputs and creative industries, while Japan leads in human capital and research, and business sophistication. Both countries have unique strengths and face distinct challenges that shape their innovative landscapes. "Made in China 2025" (Pan,2025) initiative aims to transform China into a leader in high-tech industries, while "Society 5.0" initiative focuses in Japan on integrating advanced technologies into all aspects of society to address social challenges and improve quality of life (Cabinet office, 2015)."Made in China 2025" plan focuses on ten priority sectors, including new advanced information technology, automated machine tools and robotics, aerospace and aeronautical equipment, maritime equipment and high-tech shipping, modern rail transport equipment, new-energy vehicles, power equipment, agricultural equipment, new materials, and biopharma and advanced medical products. Japan's "Society 5.0" initiative is

an ambitious vision that aims to create a human-centered society by integrating advanced technologies into every aspect of life. Namely, the initiative aims to seamlessly integrate the digital and physical worlds, leveraging technologies like the Internet of Things (IoT), artificial intelligence (AI), and robotics.

China

China ranks 11th in the Global Innovation Index (GII) 2024 (WIPO,2024g). The country excels in innovative outputs, ranking 7th in this category. This position is higher than in 2022. It performs well in areas such as knowledge and technology outputs, and creative outputs. China ranks 23rd in innovation inputs, indicating room for improvement in areas like institutions and human capital. However, this position is lower than in 2022.

Japan

Japan ranks 13th in the Global Innovation Index (GII) 2024 (WIPO,2024h). The GII position for Japan is the same for 2022 and 2024.The country performs well in innovation inputs, ranking 12th. It excels in business sophistication and market sophistication. The country ranks 14th in innovation outputs, suggesting a need to better translate its investments into tangible innovation outcomes. Also, there is a need to improve the commercialization of research.

While the scale of these efforts may vary, the underlying strategies and goals are similar, reflecting a shared commitment to fostering innovation and digital entrepreneurship.

7. The Digital Entrepreneurship Index (DEI)

The Digital Entrepreneurship Index (DEI) is a composite index that measures the quality of the digital entrepreneurship ecosystem in a country . It is based on four pillars: digital infrastructure governance, digital user citizenship, digital technology entrepreneurship, and digital multisided platforms. A study conducted by the Global Entrepreneurship and Development Institute (GEDI) found a positive correlation between the DEI score and GDP per capita. According to the Asian Development Bank, Singapore has the world's best digital entrepreneurship system, followed by the United States, Sweden, Denmark, and Switzerland (Asian Development Outlook, 2020).

According to Asian Development Outlook (2020), China is positioned as 13 in the list of countries with score of 35.3 in 2021 (Table 2). However, Bangladesh ranks 96th among 113 economies in the Global Index of Digital Entrepreneurship Systems . The index is prepared by looking at the level of digitalisation in eight areas – culture and informal institutions; formal institutions, regulation, and taxation; market conditions; physical infrastructure; human capital; knowledge creation and dissemination; Finance; and networking

and support. Bangladesh is the fourth weakest among the 21 ADB member economies, with its very poor performance in three areas – culture and informal institutions, market conditions, and human capital. The overall score of the country is only 12.5 out of 100 in the index (Tbsnews, 2022). ADB Chief Economist Albert Park said, "Digital entrepreneurship helped economies stay afloat during the Covid-19 pandemic, and it can become a major engine of growth and innovation in the post-pandemic world." "For this to happen, there needs to be a supportive environment enabled by conducive policies and incentives" (Tbsnews , 2022). One of the reasons for Bangladesh's low ranking is its poor performance in the areas of culture and informal institutions, market conditions, and human capital

Statistical data in Japan also showed that the digital entrepreneurship is on the rise. In this context , a report done by the Ministry of Economy, Trade and Industry showed that the number of new businesses in Japan increased by 4.5% in 2020, with a significant portion of these being digital startups (Asian Development Outlook, 2020). The report also highlights the importance of digital transformation for small and medium-sized enterprises (SMEs) in Japan, which can help them to improve their competitiveness and resilience (Radović-Marković ,2025).

Table 3. Global Index of Digital Entrepreneurship Systems 2021 Scores

Country	**Score (0-100)**
Singapore	81.30
United States	79.70
Sweden	79.60
Denmark	78.80
Switzerland	76.90
Netherlands	75.60
Finland	73.30
Norway	69.90
Luxembourg	69.60
United Kindom	69.00
Estonia	66.90
Japan	66.10
Lithuania	55.30
China	35.30

Source:Preparing according to Asian Development Bank. Asian Development Outlook 2022 Update: Entrepreneurship in the Digital Age (September 2022)

China Digital Economy Innovation and Entrepreneurship Index (IRIEDEC), is a set of indices that evaluate the development level of the digital economy in different regions of China. The index system focuses on the innovation and entrepreneurship behavior of enterprise entities, and evaluates the development level of the digital economy in different regions of China (Dai, Wang ,Zhang, 2021).

A report by Accenture (2022) provides insights into the digital transformation of Chinese companies in 2022 . „The report shows that Chinese companies have been making progress in digital transformation over the past five years, with 17% of them.“(Accenture, 2022, p.1)

While China has a robust venture capital market, access to capital for digital startups can still be limited compared to other leading digital economies. This can hinder the growth and scalability of new digital ventures.Winning companies, making large investments in adopting digital technologies to continue business transformation, compared to just 7% in 2018 (Accenture, 2022) . The research also shows that there has been a slight increase of 1% point in the number of companies qualifying as champions since last year, however the average score measuring digital proficiency declined for the first time in five years from 54 to 52 between 2021 to 2022, out of a total achievable score of 100 (Accenture, 2022).

According to a report by the European Center for Digital Competitiveness, China has made significant strides in digital competitiveness over the past three years, ranking second among the G20 countries (WEF, 2021). The report analyzed the digital competitiveness of 140 countries and provided a global ranking that compared them within their regions. The ranking revealed strong dynamics regarding the two global digital superpowers: China gained significantly in digital competitiveness, while the US lost out over the same time period, mainly driven by the ecosystem dimension in the ranking (WEF,2021) .

8. Education That Meets The Demands Of The Workplace In The Digital Economy

Schumpeter's theory of creative destruction to explain economic development provides an economic basis for explaining growth in the digital economy. Accordingly, entrepreneurship and new knowledge are the main driving forces in the digital economy. The destructive elements of Schumpeter's philosophy cannot be ignored in the short and medium term. First of all, it can be noted that there is a lag between the introduction of new ways of doing things and the displacement of the workforce from the old economy to the digital one. Namely, creative destruction does not immediately reduce the pain of job loss. In this context, the rapid integration of artificial intelligence across sectors is automating tasks, leading to increased productivity, but also impacting worker layoffs. Successfully adapting to digital transformation requires organizations to implement new work models and develop strategies for upskilling and reskilling their workforce. This is especially true when workers lack formal education or skills that would allow them to easily transition to the new economy. In this context, it is necessary to develop a new form of education that will respond to the new demands of the digital economy. Competency-based education or personalized learning (CBE) is considered a new and developing field of higher education in the social sciences (Radović Marković, et.al.2021). CBE has become particularly

popular during COVID-19 and has continued to be of interest to scholars since then. Competency-based education can ensure a smooth transition from school to the workplace. Accordingly, there is an opinion that the future of work cannot be imagined without competency-based education. Our research has shown that the demands on the labor market are characterized as competitive, dynamic, risky, complex and interdisciplinary Radović Marković, et.al.2021. Therefore, it is necessary for higher education to enable individuals to better understand such an environment and prepare them with the relevant skills, knowledge, ethics and attributes to succeed in it.

We can conclude that employers need to be convinced that graduates have not only theoretical knowledge, but also the competence to apply theories in real situations. Since trained workers are much more flexible than other workers. Namely, this type of education allows for greater flexibility and adaptability to a rapidly changing work environment. Consequently, universities will need to expand and revise their curricula if they want to educate students for the digital future. Through competency-based programs, students can earn their degree and gain business skills. The future looks promising for CBE because it is based on the needs of a rapidly changing society.

9. Conclussion

Digital technologies have been a catalyst for creative destruction across industries. Through creative destruction, digital technologies fundamentally alter existing routines and the structures of organizations in the conditions in which they operate, forcing them to rapidly adapt to the resulting changes. These technological changes provide the context necessary to understand today's technological transformation. How these modern technologies will transform industries and institutions, or serve to create new industries and institutions, remains to be seen. The implications of the relationship between these ubiquitous new forms of digital transformation and the accompanying new business models, business strategies, innovations, and capabilities are being worked out at the global, national, corporate, and local levels. Whatever the technological future holds, it will be defined by constant adaptation, relentless innovation, and the search for new opportunities and responses to the challenges that digital transformation brings. This study concluded that digital entrepreneurship is advancing on the principles of creative destruction, using technology to innovate and disrupt existing markets. This brings with it the need to change the forms of work and the emergence of new non-standard employment arrangements, which also require new skills and knowledge. For these reasons, there is a need for a new form of education based on creativity and competencies.The paper shows that this new cycle of innovation not only drives economic growth, but also encourages the creation of a dynamic and competitive business environment. This indicates a close connection between creative destruction, technology and digital entrepreneurship, in both small and large countries, indicating their different capabilities to respond to new challenges. However, both types

of countries recognize the importance of digital transformation and invest in digital infrastructure, technologies, and skills to stay competitive in the global innovation landscape. At last, whatever the technological future holds it will be defined by continual adaptation, perpetual innovation, and the search for new potential.

References

1. Accenture (2022). Accenture China digital transformation index 2022. Available at: Accenture China Digital Transformation Index 2022 |.
2. Alonso, C., Kothari, S., Rehman,S. (2020). How Artificial Intelligence Could Widen the Gap Between Rich and Poor Nations.Available at: How Artificial Intelligence Could Widen the Gap Between Rich and Poor Nations
3. Asian Development Outlook, (September 2020). Entrepreneurship in the Digital Age.
4. Babu, K.. (2021). Artificial Intelligence, Its Applications in Different Sectors and Challenges: Bangladesh Context. In: Montasari, R., Jahankhani, H. (eds) Artificial Intelligence in Cyber Security: Impact and Implications. Advanced Sciences and Technologies for Security Applications. Springer, Cham. https://doi.org/10.1007/978-3-030-88040-8_4
5. Bari , M.A.,(2021). Bangladesh in the age of Artificial Intelligence . Available at:Bangladesh in the age of Artificial Intelligence | The Daily Star [accessed March 05 2024].
6. Dai, R., Wang,A., Chen, B., Zhang, X. (2021). "Index of Regional Innovation and Entrepreneurship in Digital Economy in China (IRIEDEC)", https://doi.org/10.18170/DVN/EYCVSP, Peking University Open Research Data Platform, V4
7. DeSmith, C. (2023). Why China has edge on AI, what ancient emperors tell us about Xi Jinping. Available at: Why China has an edge on artificial intelligence — Harvard Gazette [accessed April 06, 2024].
8. EC-OECD (2025), STIP Compass: Lithuanian Artificial Intelligence Strategy: A Vision of the Future. Available at: Lithuanian Artificial Intelligence Strategy: A Vision of the Future STIP Compass
9. Eurostat , (2024).GDP per capita, consumption per capita and price level indices. Available at: GDP per capita, consumption per capita and price level indices - Statistics Explained
10. Garcia-Macia, D., Hsieh,C., Klenow, P. (2017). Does Creative Destruction Really Drive Economic Growth? Available at: Does Creative Destruction Really Drive Economic Growth? | NBER [accessed April 16, 2024].
11. Georank (2025). Estonia vs Lithuania: Economic Indicators Comparison. Available at: Estonia vs Lithuania Economies: 61 Stats Compared
12. Gupta, C. (2024). Top 10 countries leading in artificial intelligence (AI): Where does India rank in the list? Avaiable at: [8]. Georank (2024)Top 10 countries leading in artificial intelligence (AI): India's rank revealed
13. Independent, (2025). How a robot cafe in Tokyo aims to empower – not replace – human workers. Available at: How a robot cafe in Tokyo aims to empower – not replace – human workers | The Independent
14. Information and Communication Technology Division Government of the People's Republic of Bangladesh, (2020). National Strategy for Artificial Intelligence Bangladesh. Available at: National Strategy for Artificial Intellgence - Bangladesh .pdf

15. Invest Lithuania, (2020). Lithuania – a global leader in artificial intelligence. Is it possible?. Avaiable at: Lithuania: A Global Leader in Artificial Intelligence – Is It Possible? | Invest Lithuania
16. Khtun, F. & Nawrin, N., 2021. "Artificial Intelligence and Its Impact on Information Technology (IT) Service Sector in Bangladesh," CPD Report 17, Centre for Policy Dialogue (CPD). [accessed April 03, 2024].
17. Kopp, C. (2023). Creative Destruction: Out With the Old, in With the New. Available at: Creative Destruction: Out with the Old, in With the New (investopedia.com) [accessed February 06, 2025].
18. Lithuania (2019). Lithuanian Artificial Intelligence Strategy: a vision for the future. Ministry of Economy and Innovation. https://eimin.lrv.lt/uploads/eimin/documents/files/DI_strategija_ENG(1).pdf
19. McKinsey Global Institute (2018). Notes from the ai frontier modeling the impact of ai on the world economy. Available at: MGI-Notes-from-the-AI-frontier-Modeling-the-impact-of-AI-on-the-world-economy-September-2018.ashx (mck-insey.com) [accessed April 02 2024].
20. NetBase Quid (2022) The 2023 AI index report reveals key industry trends. https://netbasequid.com/blog/2023-ai-index-report/
21. OECD (2025).Future of Education and Skills 2030/2040. Available at: Future of Education and Skills 2030/2040 | OECD
22. Pandit, H. (2021) .Using artificial intelligence: Bangladesh has a long way to go. Available at: Using artificial intelligence: Bangladesh has a long way to go | The Business Standard (tbsnews.net) [accessed March 07 2024].
23. Radovič-Marković, M. (2025). Globalization and Entrepreneurship: Case from China, Japan and Bangladesh , Routledge.
24. Radović Marković , M., Salamzadeh , A., & Vujičić , S. (2022). Resilient, smart and green cities: theoretical aproach. *Journal of Entrepreneurship and Business Re-silience*, *5*(1), 41–47. Retrieved from https://jebr.fimek.edu.rs/index.php/jebr/article/view/9
25. Radović Marković, M.,& Đukanović, B.,Marković, D., Dragojević, A., (2021). Entrepreneurship and Work in the Gig Economy -The Case of the Western Balkans, Routledge, London, United Kingdom, ISBN 9780367725778
26. Radović Marković, M. (2023). Digitalization, Workforce Transformation and Education in the Global Economy , Eliva , Moldova
27. Radović-Marković, M.,(2023 a).Digitalization and New Skills in the Workplace, *IPSI Bgd Transactions on Advanced Research,* 19 (1), pp. 37-41. Link : http://ipsitransactions.org/journals/papers/tar/2023jan/p6.pdf
28. Radović Marković, M., & Đukanović, B., (2022). Macroeconomics of Western Balkans in the Context of the Global Work and Business Environment, Charlotte, US: Information Age Publishing (IAP), Inc., United States
29. Schumpeter, J.A. (1942) Capitalism, Socialism and Democracy. Vol. 36, Harper & Row, New York, 132-145.
30. Slotta, D. (2023). Artificial intelligence in China - statistics & facts. Available at: Artificial intelligence in China - statistics & facts | Statista [accessed March 05 2024].
31. Tbsnews (2022). Digital entrepreneurship system: Bangladesh 96th among 113 economies.

Available at: Digital entrepreneurship system: Bangladesh 96th among 113 economies | The Business Standard (tbsnews.net) [accessed February 8, 2025].
32. The China accelerates AI development to build AI innovation center (2024). The State Council the People`s Republic of China. Available at: China accelerates AI development to build AI innovation center
33. Ufberg, M. (2023). The 10 most innovative companies in artificial intelligence of 2023. Available at: The 10 most innovative companies in artificial intelligence of 2023 (fastcompany.com) [accessed March 28, 2024].
34. Ulma, (2024). The State of Artificial Intelligence in Japan in 2024: A Complete Guide. Available at: The State of Artificial Intelligence in Japan in 2024: A Complete Guide
35. Vats A, Natarajan N et al (2022) G20. AI: national strategies, global ambitions. Observer Research Foundation and Observer Research Foundation America, Washington
36. WEF, (2024). China's approach to data and AI is changing. Here's what that means. Available at: China's approach to data and AI is changing. Here's how | World Economic Forum
37. WEF (2021). These countries rank highest for digital competitiveness. Available at: These countries rank highest for digital competitiveness | World Economic Forum (weforum.org) [accessed March 28 2024].
38. West, D. and Allen, J. (2018). How artificial intelligence is transforming the world. Available at: How artificial intelligence is transforming the world | Brookings [accessed December 28, 2024].
39. WIPO, (2024). Lithuania ranking in the Global Innovation Index 2024. Available at: Lithuania Ranking in the Global Innovation Index 2024.
40. WIPO ,(2024a). Overview of Lithuania's rankings in the seven areas of the GII in 2024. Available at: Lithuania Ranking in the Global Innovation Index 2024.
41. WIPI, (2024b). Latvia ranking in the Global Innovation Index 2024. Available at: Latvia Ranking in the Global Innovation Index 2024.
42. WIPO, (2024c). Estonia ranking in the Global Innovation Index 2024. Available at: Estonia Ranking in the Global Innovation Index 2024.
43. WIPO, (2024 d). Slovenia ranking in the Global Innovation Index 2024. Avaiable at: Slovenia Ranking in the Global Innovation Index 2024.
44. WIPO, (2024e). Cyprus ranking in the Global Innovation Index 2024. Avaiable at: Cyprus Ranking in the Global Innovation Index 2024.
45. WIPO,(2024f). Overview of North Macedonia's rankings in the seven areas of the GII in 2024.Available at: North Macedonia Ranking in the Global Innovation Index 2024.
46. WIPO, (2024g). China ranking in the Global Innovation Index 2024. Available at: China Ranking in the Global Innovation Index 2024.
47. WIPO, (2024h). Japan ranking in the Global Innovation Index 2024.Available at: Japan Ranking in the Global Innovation Index 2024.
48. Wold Bank , (2024). GDP per capita (current US$). Available at: GDP per capita (current US$) | Data