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The countries of the Visegrad Group (V4) and the Three Seas Initiative (3SI) operate, like other countries, under the pressure of the innovation imperative, i.e. sustained growth and improved productivity. They strive to implement more and more technologically innovative solutions in their economies[1]. In Central and Eastern Europe and the wider Three Seas region, this trend will intensify even more due to the depletion of traditional sources of growth (mainly low production and labour costs). Moreover, the rivalry between the USA and China, aggressive actions of Russia and the new model of sustainable development based on renewable energy sources (the *Fit for 55* package) promoted in the European Union mean that the pressure on this region of Europe is high and will be even greater in the near future. In such a complex environment, the Three Seas countries must balance skilfully so as not to be reduced to the role of an object in international politics. One of the ways to increase the subjectivity of the entire region is to improve cooperation by building a dense network of interconnections so that, as a whole, the Three Seas Initiative could create a coherent economic space, and not a set of poorly connected units. However, the study of *The Rise of Digital Challengers* (and reports on individual countries in the Central and Eastern Europe region) clearly indicate that digitization will

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[1] OECD: *The Innovative Imperative. Contributing to Productivity, Growth and Well-Being*, OECD Publishing: Paris 2005, p. 19, https://read.oecd.org/10.1787/9789264239814-en?format=pdf (access: 1/10/2021).

be an opportunity for the countries of this region to maintain economic growth and improve competitiveness[2]. The existence of modern intra-regional connections will be an important element limiting the risk of the emergence of a "two-speed Europe". Serious investments in transport infrastructure, including the digital sphere, are crucial because, as the authors of the report published by the Polish Economic Institute note: "without this, Western European countries will benefit most from the dynamic development of Three Seas countries"[3].

In order to catch up with the countries of Western Europe in terms of the network infrastructure development, countries of Central and Eastern Europe should undertake serious investments, and their im-

plementation will not be an easy task. It must not be forgotten that cross-border structural projects have their own specificity of implementation, as noted by the International Monetary Fund, pointing to their particular complexity, and thus – exceptional difficulty in carrying out[4]. It will be no less in the digital sphere or in the case of projects that are to additionally maintain appropriately high sustainability standards.

Strengthening the Three Seas region's potential requires setting out a framework for joint undertakings. From this perspective, V4 and 3SI are natural forums where initiatives may appear that realistically support the process of digital inclusion in this part of the continent and where Three Seas countries can set common directions for the digital agenda.

V4

The issues of modern technologies and, more broadly, digital dimension of the economy, gradually began to appear in the presidency programs of the V4 countries. Recent years have been characterized by the growing importance that politicians attach to issues related to the digital sphere. Currently, in almost every joint declaration and communiqué issued in recent years, the heads of governments of the Visegrad Group states unanimously declare their good will and willingness to cooperate in the field of new technologies and underline their fundamental importance for the next industrial revolution. Moreover, the declarations made by countries as part of the V4 definitely fit in with the main directions set by the European Commission and the European Council. When analysing the activities formulated in official documents published by the institutions of the V4 countries, it should be kept in mind that they are not binding on the signing parties, and most often no fixed budget is planned for their implementation – allocating funds for participation in them is voluntary and depends on the will of the parties-participants.

Until 2014, issues related to the digitization of the economy were only sporadically mentioned in the V4 documents, mainly in the contexts of university education, research, justice and culture. Slovakia was the first country to devote more attention to this topic in its presidency program for 2014–2015, clearly identifying the digital economy as a key element in building the competitive advantage of the V4[5] countries. This trend was maintained in the programming documents of the next presidencies – the digital agenda entered them permanently, and the importance attached to it only grew. In addition, it is worth pointing out that in the program of the Slovak presidency, issues of cyber security and information security have been distinguished and assigned a separate role. In this respect, the cooperation forum that V4 countries maintain is the European Cyber Security Platform established in 2013 by Austria and the Czech Republic. It brings together representatives of countries and members of the national Computer Security Incident Response Team.

[2] *The Rise of Digital Challengers*, 2018, https://digitalchallengers.mckinsey.com/ (access: 1/10/2021).
[3] *Building closer connections*, Warsaw August 2020, Polski Instytut Ekonomiczny, p. 24, https://pie.net.pl/wp-content/uploads/2020/08/PIE-Three-Seas.pdf (access: 1/10/2021).
[4] *Infrastructure in Central, Eastern, and Southeastern Europe: Benchmarking, Macroeconomic Impact, and Policy Issues*, IMF, 28 September 2020, p. 3, https://www.imf.org/-/media/Files/Publications/DP/2020/English/ICESEEBMIPIEA.ashx (access: 01/10/2021).
[5] *Dynamic Visegrad for Europe and Beyond — Program of the Slovak Presidency in the Visegrad Group (July 2014 – June 2015)*, https://www.visegradgroup.eu/documents/presidency-programs/20142015-slovak (access: 01/10/2021).

In addition, in November 2014, Slovakia initiated the V4 Innovation Task Force[6], a platform supporting start-ups from Visegrad Group countries, bringing together representatives of state authorities co-creating public policies and influencing the functioning of start-ups. This initiative is maintained and being developed in the following years by successive presidencies.

In October 2015 in Prague, the ministers responsible for economic affairs signed a *memorandum of understanding* for regional cooperation in the area of innovation and start-ups[7]. Its key statement was the willingness to continue supporting the V4 Innovation Task Force initiative. In addition, the decision was made to continue the We4Startups project, initiated by Hungary and Slovakia, to build less official channels for the exchange of information and experiences. The aim of this initiative was also to facilitate establishing contacts between entrepreneurs from other V4 countries with their counterparts from the Silicon Valley. Judging by the current online presence of this project, it should unfortunately be recognized that it did not receive much attention[8].

The intentions of the V4 states are well illustrated by the statement of the V4 heads of governments from December 2016, which drew attention to the role of the Digital Single Market, calling on the European Commission to continue work on its implementation in a way that would guarantee all entities equal access and equal treatment[9]. The statement also stressed the role of data exchange between different IT systems within the EU and the need to ensure their interoperability.

It is also worth recalling *V4 Smart Platform*[10] project initiated during the Hungarian presidency in 2017-2018 and then developed during the next presidency into V4SP 2.0[11], which aims to improve the interoperability of services in the field of transport, mobility, tourism and mobile payments[12]. It should be emphasized that in the programming documents of subsequent presidencies, issues related to the digital economy are situated in the context of building a competitive advantage. In its presidency plan for 2017-2018, Hungary proposed the removal of barriers in the exchange of digital data, e.g. regarding geolocation[13].

March 2017 was of particular importance for digital solutions in the policy of the V4 countries, because during the Central and Eastern Europe Innovators Summit in Warsaw, the prime ministers of the member states signed a declaration on mutual cooperation in the fields of innovation and digitization[14]. Polish deputy minister of development at the time stated that the document "opens the way to innovation, for the Central European region to compete boldly with the most innovative economies in the world"[15]. It is worth emphasizing that in her speech Polish deputy minister indicated that the goal of regional cooperation is also to compete with companies from France and Germany. For this purpose, a separate financial line has been established under the Visegrad Fund. At this point, it should be noted that the resources at the Fund's disposal are EUR 8 million per year (EUR 10 million from 2022[16]). Unfortunately, these funds are just a drop in the ocean of needs.

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[6] The initiative consists of: Ministry of Finance of the Slovak Republic, Ministry of Economy of the Slovak Republic, Ministry of Foreign Affairs and Trade of Hungary, National Research, Development and Innovation Bureau,in Hungary, Ministry of Industry and Trade of the Czech Republic, Investment and Development Business Agency CzechInvest, Ministry of Economy of Poland, Polish Agency for Entrepreneurship Development – PARP and the National Research and Development Center - NCBR.

[7] *Memorandum of Understanding for Regional Cooperation in the Areas of Innovation and Startups*, 12 October 2015, https://www.visegradgroup.eu/calendar/2015/memorandum-of (access: 1/10/2021).

[8] One of the planned activities was the launch of the We4Startups profile, the aim of which would be to create a platform for contact between startups from the V4 countries. At the time of writing (October 2021), the last post posted on the profile was dated January 18, 2019, the group of followers was 543. Moreover the link redirecting to the official website redirected users to the site in Indonesian.
We4Startups, https://www.facebook.com/visegradstartups (access: 1/10/2021).

[9] *Joint Statement of the Heads of Governments of the V4Countries*, 15 December 2016, (access 1/10/2021).

[10] *2017–2018 Hungarian Presidency*, p. 25, https://www.visegradgroup.eu/documents/2017-2018-hungarian/20172018-hungarian (access: 1/10/2021).

[11] See *V4 Smart Platform 2 project*, https://v4sp.com/ (access: 1/10/2021).

[12] *V4 Smart Platform – White Paper*, August 2018, http://smartcluster.sk/wp-content/uploads/2018/08/V4SP_project_White_Paper_EN.pdf (access: 1/10/2021)

[13] *2017–2018 Hungarian Presidency*, p. 24, https://www.visegradgroup.eu/documents/2017-2018-hungarian/20172018-hungarian (access: 1/10/2021).

[14] *Joint Declaration of Intent of Prime Ministers of the Visegrad Group on Mutual Co-operation in Innovation and Digital Affairs*, 28 march 2017, https://www.visegradgroup.eu/calendar/selected-events-in-2017-170203/joint-declaration-of (access: 1/10/2021)

[15] *Podpisano Deklarację Warszawską*, „Puls Biznesu" 28 March 2017, https://www.pb.pl/podpisano-deklaracje-warszawska-857897 (access: 1/10/2021).

[16] The proposal to increase the budget was made in declaration issued in Cracow by the prime ministers of V4 countries in February 2021. *Declaration of the Prime Ministers of the Czech Republic, Hungary, the Republic of Poland and the Slovak Republic on the Occasion of the 30th Anniversary of the Visegrad Group*, 17 February 2020, https://www.visegradgroup.eu/calendar/2021/declaration-of-the-prime (access: 1/10/2021).

In February 2021 in Cracow, the prime ministers of four countries issued a declaration confirming the findings of 2017 and the will to deepen the mutual cooperation in the field of digital projects, creating conditions for a sustainable digital transformation in Central and Eastern Europe, and exchange of experiences between research units from this field[17]. Moreover, in line with the conclusions of the European Council from October 1, 2020, the importance of allocating at least 20% of the funds from the *Recovery and Resilience Facility* for digital transformation purposes was emphasized. The declaration indicates the key role of 5G technology in the functioning of the new digital economy. In the declaration, Poland indicated its willingness to establish an institution supporting the coordination of digital projects implemented by V4 countries. The effect of these declarations was the first meeting of the *Virtual Office for V4 Digital Projects*[18] in May 2021, which inaugurated the operation of this institution (it includes coordinators appointed directly by the prime ministers of each country)[19].

The growing importance of digital issues can be seen in the scope of the proposals contained in the plans for 2021-2022 presidency presented by Hungary. The document announces the start of discussions on new initiatives in the field of digitization and innovation, including: the Visegrad Advanced Research Project Agency, V4 Innovation Research Centre, V4 Credit Rating Agency, Common V4 Basic Research Network and a Common V4 Applied Research Network[20]. Taking into account the highly consultative nature of Visegrad Group cooperation, we will probably have to wait for the effects of these proposals, but there is no doubt that digital issues have not only entered the V4 agenda for good, but have also become its important element.

Three Seas Initiative

The official start of Three Seas Initiative was its first summit, which was held in Dubrovnik in August 2016. However as noted by the Polish Economic Institute[21], it is possible to trace its conception back to 2014, when the ideas and foundations of this concept were presented by two think tanks, the American Atlantic Council and the Polish Central Europe Energy Partners, in a report with the meaningful title: *Finishing Europe: from the North-South Corridor to energy, transport and the telecommunications union*[22]. The three areas indicated in the text of the cited publication later became crucial for the 3SI countries, which support and finance projects in the fields of energy, infrastructure and digitization. The growing importance of the digital agenda within the 3SI is best seen in the findings of successive summits. Despite a shorter history than the V4, the issues related to new technologies did not immediately become key issues for 3SI countries.

The aforementioned declaration from the summit in Dubrovnik in 2016, which launched the entire initiative, emphasized the implementation of projects of "strategic importance for countries involved in the fields of energy, transport, digital communication and economy in Central and Eastern Europe"[23]. However, there was no extra focus on the digital issue. This trend was maintained during the next summit. The second summit, which took place in Warsaw in

[17] *Visegrad Group Joint Declaration on Mutual Cooperation in Digital Projects*, Cracow, February 17, 2021, https://www.visegradgroup.eu/download.php?docID=458 (access: 1/10/2021).
[18] *Digital V4*, https://digitalv4.eu/pl/ (access: 1/10/2021).
[19] *Virtual Office for V4 Digital Projects – first meeting*, 26 May 2021, https://www.gov.pl/web/V4presidency/virtual-office-for-v4-digital-projects--first-meeting (access: 1/10/2021).
[20] *Program of the Presidency*, p. 18, https://www.visegradgroup.eu/download.php?docID=470 (access: 1/10/2021).
[21] *Building Closer Connections. The Three Seas region as an economic area*, Polski Instytut Ekonomiczny, Warsaw, August 2020, p. 8, https://pie.net.pl/wp-content/uploads/2020/08/PIE-Three-Seas.pdf (access: 1/10/2021).
[22] *Completing Europe: From the North-South Corridor to Energy, Transportation, and Telecommunications Union*, b. m. w. 2014, https://www.ceep.be/www/wp-content/uploads/2014/11/Completing-Europe_Report.pdf (access: 1/10/2021).
[23] *Wspólna deklaracja w sprawie Inicjatywy Trójmorza*, 25 August 2016, https://www.prezydent.pl/aktualnosci/wizyty-zagraniczne/art,105,wspolna-deklaracja-w-sprawie-inicjatywy-trojmorza.html (access: 1/10/2021).

2017, was held under the slogan: connectivity, commerciality, complementarity. In the joint declarations announced at the meeting, representatives of the 3SI states emphasized the importance of the investments in communication and energy infrastructure, environmental protection as well as research, development and digital communication[24]. Some details of activities of the Initiative, including those related to digital issues, were developed during the Three Seas summit in Bucharest in 2018. During the summit, member countries developed a list of 48 strategic projects[25], which are to increase the quality of their cooperation, clearly indicating three project categories to be developed under 3SI – transport, energy and digital. At the same time, projects improving communication on the north-south line were emphasized[26]. A total of 10 digital projects (8 multilateral and 2 national/bilateral) were submitted, unfortunately, as Bartosz Wiśniewski noted, "these projects are not accompanied by precise implementation calendars or even estimated costs"[27]. In declaration announced at the summit in Bucharest, the intention was also expressed to establish the *Three Seas Initiative Investment Fund*.

During the 2019 summit in Ljubljana, previous arrangements were maintained[28] and the process of assessing the state of progress of previously reported priority projects was initiated[29]. Unfortunately, the financing structure of some of them was described as "uncertain or even unclear"[30]. In this context, it is worth recalling Izabela Albrycht's remark that

two years after the establishment of 3SI, not one of the priority projects included a digital component[31]. Fortunately, the situation slowly began to change.

The statement published in 2020 during the Virtual Summit in Tallinn[32] retained the declaration regarding the transformation of 3SI into an organization that will be a tool for solving practical problems in the region. At the same time, all parties confirmed the importance the Three Seas Initiative Investment Fund. The summit was held under the *smart connectivity* slogan pointing to the importance of digital elements, which was expanded in the programming documents[33]. In this concept the creation and dissemination of common digital standards enabling the interoperability of systems was the most important issue. It was recognized that one cannot limit oneself to the digitization of processes, the mere fact of collecting data is also insufficient, a competitive advantage is only built from the moment when various data can be combined and analysed, and decisions can be made on this basis. In other words, wise use of data should apply to each of the priority projects implemented under the 3SI, so as to create opportunities for new business models. The document also emphasizes the meaning of environmental protection, including prosumer solutions in the energy sector. In the declaration, after subsequent summit of the Initiative in Sofia in 2021, all previous arrangements were maintained[34]. Lithuania will host the next 3SI forum in 2022.

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[24] *The Second Summit Of The 3 Seas Initiative Joint Declaration*, Warsaw 6 July 2017, http://three-seas.eu/wp-content/uploads/2018/06/WARSAW.pdf (access: 1/10/2021).

[25] *The Three Seas Initiative - Priority Interconnection Projects*, 2018, http://three-seas.eu/wp-content/uploads/2018/09/LIST-OF-PRIORITY-INTERCONNECTION-PROJECTS-2018.pdf (access: 1/10/2021).

[26] *Joint Declaration of the Third Summit of the Three Seas Initiative*, Bucharest 17–18 September 2018, p. 2, http://three-seas.eu/wp-content/uploads/2018/09/BUCHAREST-SUMMIT-JOINT-DECLARATION.pdf (access: 1/10/2021).

[27] B. Wiśniewski, *Wymiar cyfrowy Inicjatywy Trójmorza*, „Biuletyn PISM" 158 (1731), 26 November 2018, p. 1, https://pism.pl/upload/images/artykuly/legacy/files/25104.pdf (access: 1/10/2021).

[28] *Joint Declaration of the Fourth Summit of the Three Seas Initiative*, Lubljana, 5-6 June 2019 https://media.voog.com/0000/0046/4166/files/LJUBLJANAJoint%20Declaration%202019.pdf (accessed: 01/10/2021).

[29] *Priority Interconnection Projects 2019 Status Report*, Ljubljana 5-6 June 2019, https://irp-cdn.multiscreensite.com/1805a6e8/files/uploaded/Status%20Report%202019-online.pdf (access: 1/10/2021).

[30] *Priority Interconnection Projects, 2019 Status Report. The Summary*, Lubljana, 5 – 6 June 2019, p. 3, https://irp-cdn.multiscreensite.com/1805a6e8/files/uploaded/Priority%20Interconnection%20Projects%20-%202019%20Status%20Report.pdf (access: 1/10/2021).

[31] I. Albrycht, *Cyfrowa przyszłość Trójmorza jest naszą teraźniejszością*, b.m.w, 2021, https://trimarium.pl/wp-content/uploads/2021/06/Izabela-Albrycht-Cyfrowa-przyszlosc-Trojmorza2.pdf (access: 1/10/2021).

[32] *Joint Statement*, Tallin 19 October 2020, https://media.voog.com/0000/0046/4166/files/FINAL%20Three%20Seas%20Joint%20Statement.pdf (access: 1/10/2021).

[33] *Smart Conectivity. Vision Paper*, Estonia 2020, https://media.voog.com/0000/0046/4166/files/Smart_Connectivity.pdf (access: 1/10/2021).

[34] *Joint Declaration of the Sixth Summit of the Three Seas Initiative*, Sofia 8–9 July 2021, https://3seas.eu/event/joint-declaration-of-the-sixth-summit-of-the-three-seas-initiative (access: 1/10/2021).

Three Seas Initiative digital projects

The role that digital projects play in 3SI plans is well reflected in the priority projects submitted along with development of the Initiative. When the list of the projects was announced at the 2018 Bucharest Summit, it consisted of 48 entries in three categories (transport, energy and digital). After the summit in Tallinn in 2020, the list expanded to 77 items, and in 2021 to 90 (with their total value increasing from EUR 85.5 billion in 2020 to EUR 180.9 billion in 2021)[35]. In 2021, the structure of these projects was as follows: 49% – transport, 37% – energy and 14% – digital[36]. Among 16 digital projects in 2021, 3 were reported as inactive. Some of them co-existed with transport projects (3 projects) and energy projects (in two cases). The implementation costs of a significant part of them have not yet been estimated. The budgets of those for which it was possible to indicate a specific value oscillated between EUR 2.5 and 101.4 million. It must be noted that the program with the highest estimated budget[37] was submitted and fully financed by one country (Croatia). Out of the projects implemented for a larger number of entities, it is worth mentioning: the development of a cross-border network of data centres[38] proposed by Lithuania, cross-border transport using 5G corridors for connected and automated mobility in the Baltic countries[39], development of a cross-border optical fibre network[40]; the project of infrastructure development, creation and operation of an ecosystem of supercomputers/computing clusters in the Central and Eastern Europe region[41] submitted by Hungary and the Polish digital Three Seas highway project[42]. The projects quoted above prove that countries in this region correctly defined their deficits in the state of the digital infrastructure development and opportunities related to the economic development. Nevertheless, the resources that will be needed to implement these projects are significant.

Established in May 2019 at the initiative of Poland (Bank Gospodarstwa Krajowego) and Romania (EximBank), the Three Seas Initiative Investment Fund is the main instrument for implementing priority projects. It operates as a private investment fund - projects are assessed in terms of profitability, but it is the financially committed countries that indicate the key areas of investment, with the investment having to impact at least two countries. The Fund is supposed to combine public financing from international financial institutions and private funds interested in profit. Until mid 2021, 9 out of 12 member states have invested in the Fund. Ultimately, it is to collect between EUR 3 and 5 billion and support infrastructure investments worth up to EUR 100 billion. The Fund is able to recapitalize projects with an amount ranging from EUR 50 million to EUR 250 million. However, we should be aware that the investment needs of the Three Seas region by 2030 are estimated at almost EUR 540 billion (EUR 290 billion - road infrastructure, EUR 88 billion - energy)[43], and according to SpotData calculations, the demand for investments in ICT infrastructure in the Three Seas region will amount to approx. EUR 160 billion[44]. By May 2021 the value of the Fund reached EUR 1.22 billion (including EUR 750 million

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[35] *Status Report of 2021*, b.m. and d.w., https://projects.3seas.eu/report (access: 1/10/2021).
[36] In 2020 it was as follows: transport – 51%, energy – 32% and digital – 17%. It should be noted that some belong to two categories simultaneously, and the change in relation to 2021 is due to the fact that many energy-related projects have been submitted.
[37] The National Framework Programme for the Development of Broadband Backhaul Infrastructure in Areas Lacking Sufficient Commercial Interest for Investments, ONP.
[38] *Projects Development of Cross-Border Network of Data Centres.*
[39] *5G Cross border transport corridors for connected and automated mobility (CAM) in Baltics (Via-Baltica/Rail-Baltica).*
[40] *Development of Cross-Border Optical Fibre Network.*
[41] *Development of High-Performance Computing (HPC) infrastructure, establishment and operation of HPC ecosystem in the CEE-n region.*
[42] *The 3 Seas Digital Highway.*
[43] *BGK: potrzeba 600 mld EUR na infrastrukturę w regionie Trójmorza*, 15 May 2021, https://www.pap.pl/mediaroom/874837%2Cbgk-potrzeba-600-mld-eur-na-infrastrukture-w-regionie-trojmorza.html (access: 1/10/2021).
[44] Of which expenses for the construction of infrastructure of regional importance may amount to approx. EUR 122 billion. *Perspektywy dla inwestycji infrastrukturalnych w Trójmorzu*, b.m.w. 2019, p. 31, https://spotdata.pl/research/download/73 (access: 1/10/2021).

contributed by Poland)[45]. By mid 2021 three projects were completed[46]. Their importance may be evidenced by the fact that in October 2020, the *U.S. International Development Finance Corpora-* *tion* has approved an investment of $ 300 million in the Three Seas Fund[47]. Over time, the American involvement is to be worth USD 1 billion.

Challenges of digital cooperation

The scale of challenges faced by countries of the Three Seas region is well illustrated by the synthetic data from the *World Digital Competitiveness 2021* report, which analyses the competitiveness of 64 economies in the process of adapting to new technologies as driving forces of economic transformation. V4 countries occupied the following positions: Czech Republic (position 33), Poland (41), Hungary (45) and Slovakia (47). One of the indicators taken into account was also future readiness, which de facto measures the potential of taking advantage of the 4.0 industrial revolution. In this category V4 countries occupied the following positions: Czech Republic (position 37), Poland (39), Slovakia (46) and Hungary (61)[48]. It is clear that the distance to be made up is large, and the cooperation of the Three Seas and V4 states in the field of new technologies will be one of the most important elements in their mutual relations.

A strategic challenge, resulting indirectly from underdevelopment, is high direct mutual competition and limited potential, which is not sufficient for one country to become a leader in the field of new technologies on its own. Countries from this region that wish to strengthen their own subjectivity, will be forced, sooner than later, to make strategic choices, that will affect not only their mutual relations, but also their relations with major actors in the international arena. At the global level, the dilemmas concern the attitude of the 3SI and V4 countries to Chinese, American and European technological solutions.

Different decisions of particular states, e.g. on the strong exclusion of devices provided by Chinese entities (Romania[49]) from their telecommunications networks or a more open attitude to the Chinese technological presence (Hungary, Slovakia), will have political consequences and may negatively impact regional cooperation in the field of new technologies, e.g. cybersecurity. Nevertheless, it should be noted that the dynamics of China's cooperation with Central and Eastern Europe countries (17 + 1 format[50]) is slowing down. This slowdown results from the lack of interesting proposals from the Chinese side and the growing distance between China and some countries from this region which build their security with the help from the USA (Poland, Romania, Lithuania)[51]. At this point, it is also worth noting that V4 countries are looking for coopera-

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[45] *Cyfrowe inwestycje podstawą rozwoju Inicjatywy Trójmorza*, 10 May 2021, https://www.gov.pl/web/dyplomacja/cyfrowe-inwestycje-podstawa-rozwoju-inicjatywy-trojmorza (access: 1/10/2021).

[46] B. Daszyńska-Muzyczka mentions an investment in locomotive leasing, which concerns Poland and the countries of its immediate vicinity, a data centre in Tallinn and solar farms in the southern Three Seas. *Daszyńska-Muzyczka: Fundusz Trójmorza zgromadził już około miliarda euro*, PAP, 19 July 2021, https://www.pap.pl/aktualnosci/news%2C907215%2Cdaszynska-muzyczka-fundusz-trojmorza-zgromadzil-juz-okolo-miliarda-euro (access: 1/10/2021).

[47] *DFC Approves Over $2.1 Billion in New Investments for Global Development*, 10 December 2020, https://www.dfc.gov/media/press-releases/dfc-approves-over-21-billion-new-investments-global-development (access: 1/10/2021)

[48] *IMD World Digital Competitivness Ranking 2021*, 2021, p. 30–31, https://www.imd.org/link/5963ef400b8d4cfe8d8f79c1f4f72bf4.aspx (access: 1/10/2021).

[49] *Rumunia wykluczy Huawei i Chiny z 5G, rząd w Bukareszcie przyjął ustawę*, 16 April 2021, https://www.telepolis.pl/wiadomosci/prawo-finanse-statystyki/rumunia-wykluczy-huawei-i-chiny-z-5g-rzad-przyjal-ustawe (access: 1/10/2021).

[50] *Cooperation between China and Central and Eastern European Countries*, http://www.china-ceec.org/eng/ (access: 1/10/2021).

[51] M. Przychodniak, *Szczyt 17+1: kryzys we współpracy Chin z Europą Środkową*, „Komentarz PISM" 13/2021, 10 lutego 2021, https://pism.pl/publikacje/Szczyt_171_kryzys_we_wspolpracy_Chin_z_Europa_Srodkowa (access: 1/10/2021).

tion with technologically leading countries such as Israel[52], Japan[53] or South Korea[54], which, at least in some aspects of the development of new technologies, can be an important source of alternatives to the Chinese and American offer.

At the regional level, it must not be forgotten that not all 3SI member countries have the same unequivocally positive approach to this initiative. The distanced position of Czech Republic and Slovakia, which seem to prefer multilateral cooperation within the V4[55], is noteworthy. The central question in this context is whether V4 and 3SI countries are able to: compete without stiff competition (the example of the Turów mine[56] shows that there are areas in which it is difficult). There are many cooperation areas, and adopting a strategy that complements each other's specialization, in the fields of specific technological niches and human resources may be an opportunity. It would mean a complementary potential building, in order to develop digital cooperation based on the strengths of individual countries - using e.g. Estonian solutions in the e-governance area, Slovenian blockchain implementations, Lithuanian fintech experience combined with artificial intelligence projects developed in Romania[57]. Moreover there are areas in the digital sector, where there are no significant differences, e.g. the need to develop a global minimum digital tax model[58]. The finance Ministers of V4 countries agree on this matter.

The Three Seas project is in line with many US interests[59], which is why it is judged with great distrust by politicians of the so-called "Old Union", as evidenced by the gradual involvement in the 3SI summits of representatives of Germany[60] and the EU[61], who want to control its activities. In addition, the upcoming digital transformation should serve the interests of Three Seas member states, which may run counter to the interests of developed technology companies from the West of the continent. An example illustrating these tensions can be the Gaia-X initiative launched in 2019, which aims to lay the foundations for the European data cloud. However, concerns are raised by the fact that the main entities that make it up are 11 companies from Germany and 11 companies from France[62]. Although the Polish entity joined this initiative in June 2021[63], the government in Warsaw decided to build its own national cloud infrastructure (National Cloud[64]) based on close cooperation with American entities.

Moreover, projects loosening and modifying the competition rules on the EU market may contribute to the strengthening of the role of large Western companies, which in the context of global competition with China and the US may be perceived as a favourable phenomenon, but from the point of view of Three Seas countries may mean the consolidation of development disproportions[65]. In this context it is worth recalling the *Manifesto on the*

[52] See Ł. Ogrodnik, M. Wojnarowicz, *Szczyt V4 + Izrael w Budapeszcie*, 42/2017, https://pism.pl/publikacje/Szczyt_V4__Izrael_w_Budapeszcie (access: 1/10/2021)

[53] See V. Jóźwiak, *Perspektywy współpracy V4 i Japonii*, „Biuletyn PISM" no 121, 23 June 2021, https://pism.pl/publikacje/Perspektywy_wspolpracy_V4_i_Japonii (access: 1/10/2021).

[54] W. Przybylski, *Dlaczego Korea Płd. inwestuje w V4? Chodzi o USA i Chiny*, „Res Publica Nowa" 8 February 2021, https://publica.pl/teksty/dlaczego-korea-pld-inwestuje-w-v4-chodzi-o-usa-i-chiny-68319.html (access: 1/10/2021).

[55] See P. Bajda, *Stanowisko Czech i Słowacji wobec Inicjatywy Trójmorza – od inaugurującego szczytu w Dubrowniku po spotkanie w Lublanie*, „Sprawy Międzynarodowe" 2020 t. 73, no 2, pp. 91–108, http://czasopisma.isppan.waw.pl/index.php/sm/article/view/992/794 (access: 1/10/2021).

[56] *Polsko-czeski spór o Turów*, 17 December 2020, https://ec.europa.eu/poland/news/201217_poland_czechia_pl (access: 1/10/2021).

[57] *Digitalization in Central and Eastern Europe: Building regional cooperation*, Atlantic Council, 2020, p. 14, 16–18, https://www.atlanticcouncil.org/wp-content/uploads/2020/10/Digitalization-in-Central-and-Eastern-Europe.pdf (access: 1/10/2021).

[58] *Joint Declaration Of V4 Finance Ministers On The Cooperation In The Financial Area*, 4 September, p. 1, 2020, https://www.visegradgroup.eu/download.php?docID=456 (access: 1/10/2021); *Joint Declaration of V4 Finance Ministers on the Taxation of Digital Economy*, 5 October 2018, https://www.visegradgroup.eu/calendar/2018/joint-declaration-of-v4 (access: 1/10/2021).

[59] *The Three Seas Initiative*, Congressional Reseach Service, 26 April 2021, pp. 1–3, https://sgp.fas.org/crs/row/IF11547.pdf (access: 1/10/2021).

[60] T. Żornaczuk, *Niemcy wobec Inicjatywy Trójmorza*, „Biuletyn PISM" 120 (1868) 22 August 2019, https://pism.pl/upload/images/artykuly/794e21aa-cf9a-4849-b8c0-b352701382b5//1570910929759.pdf (access: 1/10/2021).

[61] A. Balcer, *Polska i Trójmorze po Trumpie: szansa na nowe otwarcie?*, February 2021, p. 6, https://www.batory.org.pl/wp-content/uploads/2021/02/Polska-i-Trojmorze_Komentarz.pdf (access: 1/10/2021).

[62] K. Popławski, J. Jakóbowski, *Trójmorze jako odpowiedź Europy Środkowej na globalne i unijne wyzwania*, „Sprawy Międzynarodowe" 2020, t. 73, no. 2, p. 33, http://czasopisma.isppan.waw.pl/index.php/sm/article/view/984/790 (access: 1/10/2021).

[63] https://cloudeurope.pl/cloud-community-europe-polska-dolacza-do-programu-gaia-x-cloud-community-europe-polska-joins-gaia-x-programme/ (access: 1/10/2021).

[64] *Chmura Krajowa*, https://chmurakrajowa.pl/RegionGoogleCloud/ (access: 1/10/2021).

[65] K. Popławski, J. Jakóbowski, op. cit., pp. 31–34.

development of the Digital Single Market[66], published in September 2021 by CEE Digital Coalition - a coalition formed in 2020 the, associating 14 organizations from the digital industry from 11 Three Seas states. This document highlights the fact that the new regulations may adversely affect the competitiveness of technology companies from Central Europe and the entire EU. The different specificity of business models within the digital industry and threats related to the promotion of legal solutions in the EU (incl. *Digital Service Act, Digital Market Act*), which would cover the entire industry, not taking into account its diversity.

In this part of the continent investments in the ICT sector were implemented to a much lesser extent by private entities, therefore the natural catalyst for change here are the actions and incentives from the public sector. Cooperation in the field of digital projects faces many obstacles or is linked with many challenges that arise from structural constraints in specific countries - the structure of their economies and low research expenditure, both on state and private levels. One cannot ignore the fact that the Three Seas region lacks influential native IT companies (with a range and resources significant in Europe). Moreover, in 2019 the V4 countries allocated

1.44% of GDP to research and development, with the EU average of 2.2% of GDP[67]. In addition, the lack of capital interested in investing in new technologies is a serious limitation - out of EUR 7.7 billion from venture capital funds collected in the EU in 2018, only EUR 124 million were allocated to V4 countries (of which 70 million to Hungary and only 4 million to Slovakia)[68]. For these reasons, initiatives undertaken by Visegrad Fund and the Three Seas Fund may be an important element supporting the cooperation in the field of innovative digital projects, but the funds allocated to their support would have to be significantly increased.

However, in the near future, it is not only the infrastructure that will be a challenge, but also the human factor. In this context the starting point for V4 countries in the field of digitization is well reflected in the words of the authors of the report *Our Future: Visegrad 2025*: "the hardware layer of digitization is more advanced than the software and skills aspects"[69]. Only 3-4% of graduates are IT and technical graduates[70], which, combined with the strong phenomenon of "brain drain" will be a serious barrier to the dynamic development of digital projects in the Three Seas region.

Two final questions

The coming years will be crucial for the cooperation that will develop between the Three Seas states in the field of new technologies. One must remember two questions that can serve as a kind of "cognitive filter" that helps to focus attention on processes significant from the perspective of the future of Three Seas states and their role in the European Union. First of all, an answer should be sought to the question of how and in what areas the countries

forming V4 and 3SI will build technological independence - will the national, regional or European perspective be the starting point? Secondly, what will be the role of this region and the states that make it up in the EU's struggle for digital sovereignty[71] - how companies from this region will compete with entities from the western part of the continent and what will be the share of entities from outside the Old Continent?

[66] *Towards the digital – CEE's vision*, 29 September 2021, https://cyfrowapolska.org/wp-content/uploads/2021/09/CEE-Manifesto2.pdf (access: 1/10/2021).

[67] *Grupa Wyszehradzka – 30 lat transformacji, integracji i rozwoju*, Polski Instytut Ekonomiczny, Warsaw, February 2020, s. 6, https://pie.net.pl/wp-content/uploads/2021/02/PIE-Raport-Grupa-Wyszehradzka.pdf (access: 1/10/2021).

[68] S. Szabo, *Transition to Industry 4.0 in the Visegrad Countries*, "Economic Brief" 052, Luxembourg 2020, p. 10, https://ec.europa.eu/info/publications/economic-and-financial-affairs-publications_en (access: 1/10/2021).

[69] G. Dall, D. Bartha, D. Bartha, B. Feledy et al., *Our Future: Visegrad 2025*, Visegrad/Insight 2021, p. 10, https://visegradinsight.eu/app/uploads/2021/10/Our-Future-final.pdf (access: 1/10/2021).

[70] S. Szabo, op. cit., p. 5.

71 See Tambiama Madiega, *Digital sovereignty for Europe*, European Parliamentary Research Service, July 2020, https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651992/EPRS_BRI(2020)651992_EN.pdf (access: 1/10/2021).

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