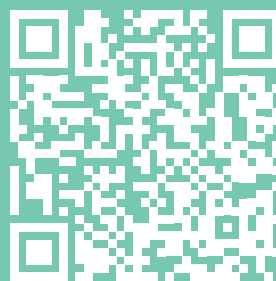


New Digital Frontier

CEE Voices on the Metaverse



Visegrad Insight's foresight
on future policy directions
in the EU in the context
of democratic security
and common EU values



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Executive summary

The metaverse is the next stage in the development of the Internet, and it will reshape how we work, learn and spend our free time. For now, however, awareness of its benefits, opportunities and threats is very low, which increases the risk of us being passive recipients rather than driven agents of the upcoming revolution. This pessimistic scenario need not materialise as the metaverse brings opportunities to Central and Eastern Europe (CEE) that can help foster equality, strengthen democratic security and boost economic growth.

Tapping into this potential can be achieved by using the tools of the metaverse to leverage limited and shrinking resources, especially human resources. This is of paramount importance for the ageing populations of CEE countries. With the metaverse, we can provide quality education and jobs in underprivileged regions, preventing depopulation. At the same time, healthcare professionals can better coordinate their efforts in monitoring and diagnosing dispersed or rural populations. Moreover, citizens have the means to maintain social interactions and take part in various activities that are not currently available. All of these developments are especially important for our demographically ageing communities.

At the moment, we are not ready to leverage these opportunities. People dabbling in the metaverse are mostly isolated, creating islands of excellence and failing to create a proper ecosystem. Such an ecosystem is needed in order to present challenges and opportunities, provide expertise and raise awareness of the public and politicians alike. Only then can countries – preferably whole regions – create a unified strategy towards the metaverse.

Such a strategy is necessary to efficiently utilise the CEE region's limited resources and avoid over-competition, nurturing a more focused specialisation instead. Moreover, such a coalition would be more than capable of initiating and influencing the regulation process at the EU level. This is needed to prevent the all too common over-regulation in Europe and to focus on creating necessary standards that would foster the development and expansion of the metaverse, including identification, digital ownership, performing business activities and working through the metaverse.

What Is the Metaverse?

The metaverse is a new and emerging concept; while its definition is still in flux, we understand it as a technology that encompasses:

1. cyberspaces – virtual spaces that exist independently of users and, even in their absence, contain various digital objects and provide the ability to manipulate and interact with them;
2. avatars – digital representations of users that are the medium of interaction within the cyberspace;
3. access through the Internet – the metaverse is the next level of development of the Internet and, as such, a part of it. Therefore, it should not be confused with applications available on-site only, despite using a similar interface. However, we have to keep in mind that many stand-alone applications might and do evolve into a part of the metaverse;
4. interoperability – the ability to seamlessly move between cyberspaces using the same avatar along with any owned digital objects.

While the first three elements have already been implemented in various products, the fourth functions only within centralised platforms like Roblox¹ or Fortnite, sometimes called sub-metaverses. Therefore, the metaverse is fragmented and lacks the versatility and platform independence of technologies such as the World Wide Web. The full potential of the metaverse lies in linking various existing cyberspaces, which can be achieved gradually through technological revisions. For example, creating a single avatar that is operable on several major platforms and can be a standard for future projects lies well within the grasp of current technology. Interoperability is required to create a digital economy

¹ Roblox is an environment consisting of cyberspaces that can be visited and edited by users. It provides a unified environment that allows for seamless transfer between cyberspaces within Roblox. The platform is mostly used for gaming.

that will further incentivise investments, leading to a virtuous circle of innovation.

The metaverse cyberspaces may be digital twins of a portion of existing real space (a building or a city) or be completely different from what we know (a fantasy world). The first approach also allows the integration of cyberspace and real space, which involves overlaying cyberspace on real space. This gives rise to augmented reality and two-way interactions where changes in the real world influence cyberspace and vice versa (for example, one can control appliances in their home when entering cyberspace that incorporates a duplicate or twin of their home).²

The concept of the metaverse is also closely connected with other technologies:

- *an interface that allows for better immersion in cyberspace*

The metaverse is mostly and rightfully associated with virtual reality (VR) technology, mostly VR headsets. These are subject to constant innovation to make them less inconvenient to wear and use by limiting weight and occurrences of motion sickness. The goal is also to provide more mobility while avoiding collisions with real objects while the user is in the metaverse. One way of achieving this is by integrating augmented reality (AR) technologies that allow VR users to see real objects while immersed in virtual reality before a collision occurs. These solutions are getting better quickly yet still require substantial innovation while keeping prices affordable.

The metaverse can also be accessed via regular computers and mobile devices using screens. Such an approach is less popular than VR because access based on screens is far more complicated to set up, and

the benefits are quite limited compared to the more immersive approaches. Therefore, screen-based interaction is usually a backup for users who cannot access their usual gear at a particular time or place or in the early stages of developing a solution.

The next stage of immersion will come via haptic technology, which imitates touch via wearable clothing. Currently, this is mainly limited to gloves, but it can be extended to other pieces of clothing.

The ultimate goal is a computer-brain interface that can stimulate all senses; however, this remains beyond the realm of possibility for now.

Another set of technologies allows the metaverse to manifest itself in the real world. Best-known applications overlay the metaverse objects in real space via AR glasses. In such an approach, the metaverse is only visible to people using dedicated hardware. More general integration is to be achieved via holographic technology³ to provide realistic interaction of cyberspace with real space for everybody, even without wearable hardware. The results have been mixed so far⁴.

- *Artificial intelligence*

While AI is a topic by itself, it is interlinked with the metaverse. AI will help populate the metaverse with engaging, innovative and interactive content while decreasing the cost of creating cyberspaces. AI will allow the creation of life-like worlds with designed atmospheres or recreate certain conditions. This way, it will be possible to achieve the experience of total immersion in specific settings without the need to create custom sceneries and train authors. AI already powers many technologies available in the metaverse, including enhancing ergonomics like eye tracking, digitalisation of objects and others.

² Virtual reality VR – cyberspace that is a separate universe and has nothing to do with the real world. Augmented reality AR – cyberspace that is overlaid on reality. It adds information or context to help you move around real space, e.g. providing translation of signs, directions, etc. Mixed reality MR – cyberspace that not only is overlaid over reality but also interacts with it so that actions in one have effects on the other. All of these constitute extended reality ER.

³ A holograph is a three-dimensional picture that can be projected in space.

⁴ <https://www.techradar.com/opinion/if-you-facetime-me-with-apples-new-vision-pro-headset-ill-end-our-friendship>

— *Blockchain*

Blockchain⁵ technology is set to be the backbone of the metaverse economy. Its application as an in-metaverse ledger⁶ enabling cryptocurrency transactions is important but secondary. The non-fungible tokens (NFTs) that are also a product of blockchain represent unique items in the digital world and can be linked to rights to a portion of space (analogue of real estate), digital items, designs, etc., that can then be traded. This can create conditions of scarcity in the metaverse that are necessary to create an economy and reward successful creators and artists.

— *Internet of Things (IoT)*

Various hardware elements connected to the Internet can be integrated into the metaverse and represented there. These include but are not limited to cameras, sensors, GPS tracking devices, mobile devices and more. Their application may include creating live replicas of physical spaces that can interact with them via cyberspace.

⁵ Blockchain is a method of storing data. It has several properties that made it popular in the Internet. In particular it allows for a trusted ledger without central authority. Blockchain gave also rise to cryptocurrencies.

⁶ Blockchain allows to record transactions and data concerning ownership creating electronic, secure and trusted ledger if implemented correctly.

Metaverse

– State Of Play

The metaverse is in its infancy, comparable to television in the 1920s. Although some applications exist, we are still determining the paths their development will take and how the metaverse will reshape our reality. Awareness of the metaverse is also quite limited among the general public. However, the metaverse is coming whether we are prepared for it or not. We can still shape its development, but the metaverse will shape us instead if we fail to act now.

The adoption of the metaverse has been much slower than anticipated. Several factors have caused this, such as the cost of hardware or lacking infrastructure and broadband. Moreover, the metaverse requires unique features and applications **native to the metaverse** to accelerate adoption significantly. But so far, most metaverse applications are based on replicating reality and real activities with virtual substitutes. In such instances, the metaverse is inferior in experience and often cumbersome in execution compared to the real thing. That is why the metaverse is more often used when other factors are at play: for example, if cost, time of travel and other considerations outweigh the inconveniences and shortcomings of the metaverse.

Nevertheless, the metaverse will be preferred to the real world for certain activities, and its adoption will increase rapidly. A good example of this is the growing popularity of VR gaming; the metaverse provides an experience not available elsewhere, and it is native to this space. Some AR applications are popular for the same reason, like Google Maps' Live View option that overlays directions onto surroundings – a feat hard to imagine being performed in any other way. Also, immersive education allows students to experience environments or activities that are not available in a regular setting, like experiencing historical events, other planets or dissecting the human body.

Perhaps contravening many common assumptions, the general public's wide-scale adoption of the metaverse in gaming is limiting the spread of other applications. Gamers and other potential users do not constitute perfectly overlapping sets, while gaming is the only storefront widely available to users. Therefore, other applications struggle to secure a position in a game-dominated marketplace. This also makes monetisation of the metaverse solutions much harder, limiting private investments. New storefronts start to appear like Meta Quest for Business but are still limited in reach.

The public sentiment after the COVID-19 pandemic is also a factor; people are hungry for physical contact after digital tools were forced upon them for human interactions, limiting the uptake of metaverse solutions. All these combined factors – limited funding, long-term perspective for profits and wavering public sentiment – are slowing the development of the metaverse.

However, this sluggish uptake of the metaverse masks the significant challenges awaiting us when it will eventually dominate the Internet. Due to limited participation, we are currently not observing many problems with bot activity, espionage, cyberbullying, fraud and other problems plaguing the digital world. This is due to the fact that small societies are much easier to self-govern and curb these problems. When widespread adoption occurs, all the well-known problems from the Internet and social media platforms will be amplified, and new issues specific to the metaverse will also arise. It is essential to introduce safeguards and rules of conduct while it is still possible. The time to act is now.

Metaverse – Opportunities For the CEE Region

CEE is quite a remarkable region. It managed to successfully emerge from the communist block and integrate itself with the West both economically and institutionally. It is one of few cases in the world where the transition to democracy was successful. At the same time, the region enjoyed tremendous and unparalleled economic growth, surpassing some Western European countries.

A large pool of highly educated specialists combined with ingenuity and innovativeness led to significant achievements in many sectors, including modern industries. CEE is where Skype, The Witcher, Cyberpunk 2077, Warmate drones, Billon, Prezi, Beatsaber and many more call home. Today, the metaverse opens another set of circumstances that CEE has started to pursue since the interface plays into many of the region's strengths while offering opportunities to address many of its problems.

Economic impact

The metaverse is also a huge economic opportunity for CEE countries.

CEE is facing a shortage of skilled workforce due to an ageing society. The role of the metaverse in increasing workforce participation is manifold as it decreases various obstacles people face trying to acquire a job. It opens opportunities for groups traditionally excluded from the labour market, like people with disabilities and other home-bound people. This is especially important for older people because they represent a valuable source of experience often lost while retiring.

The metaverse can extend the working period to benefit the economy and retirees in the face of falling pension replacement rates. One may fear that older

people will be unable to adapt to such technology, but experiments with VR technology in nursing homes show this is not the case.⁷ Last but not least, the metaverse may provide an elastic approach to working hours for groups that find such features important, including parents of small children as well as caregivers of older adults and people with varying levels of ability.

It is also worth noting that the metaverse will allow local companies to tap into a talent pool outside the region, increasing CEE's competitiveness. Virtual workspaces paired with AI may help alleviate many communication problems, e.g., by lowering language barriers. Still, there are more opportunities available.

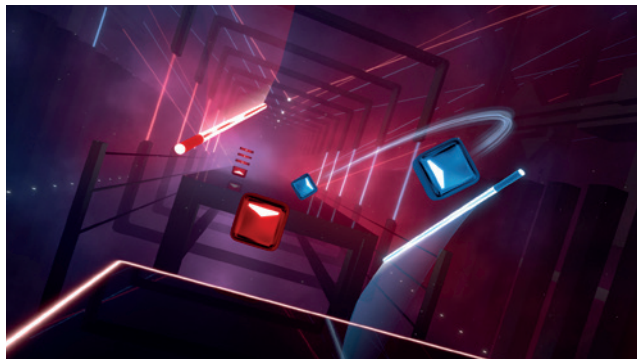
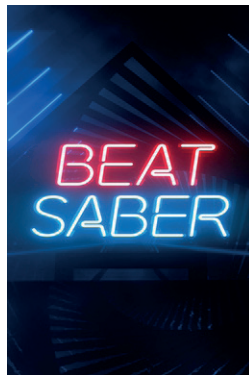
The appeal of the metaverse for companies from the CEE region is that it allows them to compete with everyone on nearly equal footing, especially now in its early days. Like many IT-based businesses, it is easily scalable and has global reach without investing

in large production capabilities and distribution channels. The e-goods market is especially interesting as creativity can be quickly scaled to any degree desirable. The CEE companies used these advantages before, resulting in successes such as Skype or Prezi. Large IT services sectors, along with a sizable freelance market, are resources that can be utilised to leverage this opportunity. The metaverse is an unknown territory ready to be explored and utilised with a significant first-entrant advantage.

The CEE region is also well known for its contribution to the gaming industry, and this is the area in which the metaverse is currently developing the fastest. One of the most popular VR games, Beat Saber, comes from the region. However, the major local franchises have yet to tap into this potential as we await the Witcher or Cyberpunk 2077 adventures in virtual reality. This is also a promising pool of talent

Beat Saber

Beat Saber is a game created by a team of Slovaks and released in 2018 by the Czech studio Beat Games. The gameplay revolves around slicing squares, representing musical notes, with a virtual sabre to the music's beat. The game offers multiple songs and environments in which the gameplay takes place. It is one of a handful of games considered native to VR. After its release, the game became an instant hit and the highest-rated game on Steam. It also received numerous awards in 2018 and 2019, including Best VR/AR game in The Game Awards 2019. In November 2019, the publisher Beat Games was acquired by Meta.



⁷ <https://www.washingtonpost.com/technology/2023/12/21/virtual-reality-eldercare-benefits-loneliness/>

Three Cubes

Three Cubes is a gaming project developed in Lithuania that is the next iteration of sandbox games. It is an improvement over Minecraft as it provides more involved features concerning scenario building, social aspects and enhanced interaction within the worlds created. This project is focused on educational experience with trials currently undertaken in schools in Lithuania and Poland with promising results. The application is on track to reach 30,000 active users this year.



that can be used in other applications of the metaverse, which shows the advantage of the region as an early entrant.

The metaverse may also cut the red tape and streamline many bureaucratic procedures – helping citizens, entrepreneurs and bureaucrats. Metaverse offices are just a basic application, but more are coming. Municipalities in CEE, like Riga, are already collecting data about cities in a way that allows the metaverse to recreate a digital twin. This technology enables the modelling of urban changes and the assessment of how specific investments affect cities and their landscapes. Additionally, it facilitates the creation of “memory lanes,” providing the ability to visualise cities as they were in the past and to track their development over time.

CEE, relatively speaking, is a highly industrialised region facing a shortage of qualified workforce; this problem could be mitigated with the use of an industrial metaverse as numerous applications allow for the creation of digital twins of product lines or even entire factories. In such cases, smaller teams of experts can monitor the operations and troubleshoot problems online, guiding less experienced technicians on-site. The industrial metaverse also allows for easier prototyping, stress testing and collaboration between teams.

CEE may also utilise the metaverse in many other areas to further its development. Promoting culture and tourism is the most apparent approach that could give potential travellers a taste of what they may experience upon visiting.

Fostering Equality and Sustainable Development

The CEE region faces a demographic crisis. Decades of low fertility and emigration to the West have resulted in shrinking societies. This process has just begun but will accelerate with every passing year.

The shrinking national populations are only part of the wider picture. Urbanisation fuels internal migration where metropolises entice residents away from towns and rural areas. Vibrant capitals are growing despite overall demographic trends but at the expense of smaller cities.

The falling population numbers tell but part of the story. These migrants are mainly young and active, leaving the demographic make-up of the regions and towns they leave behind far older in comparison. At the same time, urban centres struggle to accommodate all new inhabitants, which reflects the exuberant rent

and real estate prices and can lead to pathological living arrangements. At the same time, empty houses in provincial areas can be purchased at a fraction of the cost of small apartments in the city.

The reasons for internal and external migration have been the same for decades: to get access to better jobs, better education for children and better infrastructure. The metaverse is a tool that can counter these factors and slow migration or even reverse the process in certain cases.

The move towards remote work, forced by the pandemic, is now reversed. It increased employee satisfaction and, in some cases, increased productivity, though this may only be temporary. Obstacles in communication have proven to be detrimental in the long run – especially in the case of onboarding

and training new employees. While only some tasks can be effectively done online using collaborative tools like Teams or Zoom, much more can be achieved using VR representation of workspaces.

The metaverse can create authentic virtual working environments with tools unavailable elsewhere, hence the default mode of communication and interaction. Simply substituting on-site with online is not sufficient to generate increases in efficiency.⁸ In other words, the metaverse must reshape how we work to become native for at least some processes. When that happens, physical location will be a secondary matter, and the inclination to relocate internally or externally will diminish.



ProfiAuto Virtual Garage



ProfiAuto is an education software developed in Poland that aims to train car mechanics. It goes over several typical scenarios in car repair that require diagnostics and proper reaction. It is used by schools in Poland and Czechia, with over 400 students participating. The developer of the project organises competitions for schools that are performed using simulations. It is developed with the assistance of major car parts producers and is an excellent example of the cooperation between businesses and schools.

⁸ https://hbr.org/2021/12/remote-work-should-be-mostly-asynchronous?utm_medium=social&utm_campaign=hbr&utm_source=facebook&tpcc=orgsocial_edit

Similarly, the widespread adoption of the metaverse in education would diminish the differences in the quality of schooling between metropolises and regions. This can be achieved in many ways. The metaverse integrated into instruction can alleviate many problems with the availability of visual aids and teaching aids of good quality. It can also allow prototyping, simulation of mechanisms and experimental learning practices – activities typically requiring expensive components and parts while removing possible dangers and allowing for easy retries. If done at scale, it could help create and deploy curriculum at a lower cost while increasing quality.

These benefits are not limited to aids but can and should be extended into instruction. There is a deficit of teachers in certain specialisations (mainly STEM), and many teachers teach classes of various types to fill the hours required by contracts. This system precludes specialisation and affects quality. Instruction through the metaverse for these subjects should diminish the gaps in the quality of education delivered in schools. Adoption should also be easy as current metaverse projects for schools like summer schools or presentations are overbooked, indicating the considerable level of demand and readiness to engage in the metaverse.

The metaverse can also create spaces for gifted kids or those interested in niche topics. Normally, they are left on their own as gifted programmes are often absent from the regions. This is another reason parents emigrate so their children can fully utilise their children's potential. And even if gifted children remain in their neighbourhoods during early education, they leave for studies – rarely returning. Using the metaverse in education may cause the brightest to stay in their localities and decrease brain drain, a significant factor hindering growth opportunities of the CEE.

Democratic security

Democratic governments aim to maintain cohesion, stability and equality in their societies. The lack of inclusion leads to isolation, radicalisation and often political instability, resulting in illiberal regimes that try to weaken democracy. This pattern has been witnessed across the Western world, especially in CEE.

Many of the conditions conducive to the rise of illiberal movements disproportionately impact the most vulnerable members of our communities. However, while our ageing societies face challenges with public policies – including but not limited to access to medicine, life-long learning and end-of-life care – the metaverse offers innovative solutions to combat these issues. Telemedicine and patient monitoring over the metaverse will be much more efficient and accurate, especially considering many patients will be home-bound.

Even more significant quality-of-life gains may arise from the social aspect of the metaverse that will allow older adults to maintain social ties with family and friends on a much more involved level than currently permitted by videoconferencing. Virtual reality allows people to participate in the same events or see the same surroundings, even for bed-bound people. This transforms mere contact into genuine interaction and shared memories. Pilot programmes in nursing homes show that older adults have little problem with adopting this technology, and the effects on mental health are very positive⁹.

All of these developments should be applied not only to older people but also to other excluded groups like the differently abled, people taking care of children, refugees and others. For this to succeed, the technologies need to focus on accessibility so that

⁹ <https://www.washingtonpost.com/technology/2023/12/21/virtual-reality-eldercare-benefits-loneliness/>

Anatomy VR

Slovak solution Anatomy VR is an innovative take on learning human anatomy. Instead of looking at pictures, users can perform a virtual autopsy and observe intricate interconnections between various body parts. What started as a student project in 2014 is now a fully fully-fledged product with immense popularity. It is used in over 180 countries and prestigious institutions like Stanford University, University of California, United States Coast Guard Academy, University of Illinois, Queen Mary University of London, Medical University of Vienna, Hannover Medical School, Victoria University Melbourne and more.

The test results of students using Anatomy VR are on average 45% higher, and over 90% of participants would like more classes enriched by VR.





Unicorn VR

Unicorn VR is a Polish company specializing in the therapy and education of children with special needs using VR. Virtual reality is used to adapt the level of stimulation to the needs of children so they feel safe and can perform other activities more efficiently. The company is expanding their VR-assisted therapies to adult therapies for depression and general education. The company is also training therapists in VR-assisted methods of helping their patients.



utilising them is not hindered by various levels of ability. Even now, VR is successfully used not only to enable but also to provide therapy and relief.

Quality of life improvements are not even the only benefit to be gained. The metaverse is a chance to increase workforce participation in CEE, which suffers from an inadequate labour market and still employs a lower proportion of its population than the West.

Finally, the metaverse can be a space to celebrate diversity. Currently, many local cultures and languages are under pressure from technology. Many worldwide applications still need the national languages of EU countries as an option (i.e., Slovenian in iOS), not to mention regional languages and dialects, which drives them into obscurity. The metaverse spaces dedicated to minorities' cultures, languages and art are a way of preserving and promoting their heritage and giving them new energy to flourish.

Call to action

1. Build Awareness

The biggest obstacle to adopting the metaverse in the CEE region is the need for more general awareness and a proper ecosystem. Exciting projects and companies are primarily islands of excellence disconnected from each other and often abandoned upon completion. This translates into a need for an appropriate communication strategy directed at the government (local, national and transnational).

Politicians need to be made aware of what the metaverse even is – not to mention its consequences. The same is true about the public, for which the metaverse is just a buzzword. For when these barriers are overcome, small public projects – like the VR exhibitions from the museum in Riga – can have a tremendous impact and begin unveiling the potential of the metaverse for participants.

Such a level of unawareness is hardly surprising as one of the observations from the round tables we held in 10 CEE capitals is that the metaverse ecosystem barely exists within CEE countries, not to mention transnationally.

There are attempts to consolidate the ecosystem, but these are only in their nascence and need help to gain momentum and influence. This places an enormous responsibility on the shoulders of several groups of stakeholders: VR start-ups, scientists developing and researching the metaverse, NGOs dealing with education and technology and last but not least, big tech. The latter's responsibility is to initiate networking and coordination of other stakeholders both on national and regional levels.

It is also essential to build confidence in local CEE actors to ensure they are treated as partners in the discussion by providing equal access to knowledge, hardware and services just as their counterparts in the West. Currently, local entities fear unequal competition from larger and better-

connected Western corporations. As such, local start-ups are hesitant to invest time, resources and credibility in promoting the idea of the metaverse. A more open and active approach by big tech would build trust and make other stakeholders more likely to own the idea of the metaverse and spread the word organically throughout CEE societies.

A coherent communication strategy can be developed only when the active ecosystem of the metaverse and VR-related entities exists. This, in turn, can create efficient lobbying and provide the necessary expertise to develop the region's systemic solutions.

Action points:

- Create nationwide metaverse networking platforms like Polish Komitet ds Metawersu that foster cooperation and networking of stakeholders
- Encourage transnational cooperation of such platforms
- Create accessible content explaining the benefits of metaverse targeted at various stakeholders
- Increase accessibility to metaverse via publicly accessible means, including libraries, museums or mobile units

2. Build Strategy

With the exception of Slovenia, all CEE countries intend to include the metaverse in their upcoming digitalisation strategy update; however, these nations are currently not looking at the metaverse from a systemic point of view. This strategic misstep is the direct result of society's and politicians' low level of awareness.

Since countries in the CEE region are fairly small and have limited capabilities and focused expertise, it is not prudent for them to compete in all areas of the metaverse. Therefore, we recommend that the countries focus on selected area(s) of application

of metaverse technology and focus on developing capabilities to specialise.

We have already seen similar approaches in the West – for instance, in Italy, we have seen an uptake of VR and AR solutions in the luxury goods market, apparel and e-commerce, with the Italian eyewear conglomerate and Ray-Ban parent Luxottica pairing up with Meta to launch a series of smart glasses back in 2021. Similarly, CEE countries should make a thorough analysis to identify sectors where their competitive advantage would be the strongest and leverage their unique capabilities and resources. Naturally, some CEE states will choose to focus on similar areas, competing within their chosen sectors – hence, international cooperation is to be promoted in the long run to leverage synergies between the countries and minimise the risk of overt competition over human and technological resources.

Ideally, the region would benefit from a more cohesive policy, one that concentrates on cooperation and the division of roles based on experience and the available talent pool in CEE nations. Such a strategy could stem from previously existing coordinated efforts and transnational collaborations like the Visegrad Group, the Three Seas Initiative or bilateral/multilateral agreements. While this would be the most exemplary approach, it is also time-consuming and faces many obstacles, so CEE countries should not wait to develop their own national strategies.

Action points:

- Identify and exploit desirable niches for specialisation by:
 - _ Finding local islands of excellence and leveraging their experience
 - _ Directing public funding into R&D in these areas
 - _ Encouraging international collaboration for knowledge transfer
 - _ Create regulatory sandboxes and incubators for startups
 - _ Encouraging cooperation between large players and SMEs

Metaverse strategy should focus on:

— *education*

Education is the crucial element on which leveraging opportunities of the metaverse depends. Using the metaverse for educational purposes needs to be far-reaching and multi-layered.

Nearly all society groups need to be educated, albeit in different ways. For the professionally active, it needs to be presented as a collaborative tool, while for older adults, it can be used to increase the quality of life.

For several reasons, however, the biggest challenge lies in the education system for young people. Firstly, educating teachers to use these technologies and providing the necessary hardware and software is a huge endeavour. Secondly, rearranging the entire system to leverage the opportunities requires planning and foresight. The tools and hardware should be introduced in the rural communities first as they have the most to gain, while schools in the metropolises will often be able to join the programmes independently. Starting the programmes in the metropolises is organisationally much easier, but this is a trap that will increase inequalities within the countries.

Thirdly, due to the nature of emerging technology, it is very hard to fix the metaverse programme on the state level as it will become obsolete before it is approved. The approach here must be flexible and conducted in partnership with external stakeholders like NGOs, start-ups, and big tech.

Finally, safety is an overarching element of education since the obvious and hidden dangers to minors must be accurately and consistently assessed. It needs to be made clear from which age entering virtual reality is safe and how much time minors and adolescents can spend safely in the metaverse. While the metaverse is a source of wonderful opportunities, it also brings many dangers unknown on the regular Internet, such as cyberstalking, privacy concerns, identity theft and theft of digital assets – the scope and extent of criminality possible in the metaverse goes far beyond what we have so far become accustomed to.

— *promoting inclusion for talent and workforce retention*

CEE is being presented with the chance to enhance its position in many sectors by embracing opportunities in technological advancements and the metaverse. If CEE nations are able to carve out niche markets, like the above example of Luxottica from Italy, it holds the potential to drive innovation in numerous industries and sectors.

However, the current resource limitations related to talent and the labour force cannot be ignored. These shortcomings have been exacerbated by brain drain to Western countries and by inadequate inclusion, training and education for various marginalised demographics. These issues are likely to worsen with the ageing of society and the inclusion of Ukrainian refugees, who have largely settled in the CEE region. Many of these refugees are women, often unable to continue working in their original professions. They now find themselves as the primary caregivers for their dependents and children, whose formative years, meant for socialisation, are now marred by the trauma of war, displacement, severed social and family ties, and disruption to education. This upheaval is likely to hinder their ability to contribute fully to the economy in the future.

As evidenced in this report, the metaverse does offer solutions to these challenges and ways to integrate those who feel displaced, overlooked or limited by their physical or economic ability. In order to take advantage of what this technology has to offer, national metaverse strategies will have to be comprehensive and span multiple policy areas with the aim of encouraging undervalued segments of the workforce, both present and future. This could be achieved by setting up training programmes, higher education courses and schemes focused on the specific needs of the country, which follow strategies for developing niche markets that echo previous and burgeoning areas of economic excellence.

These steps should be complemented by efforts to facilitate skills and career development for tech professionals – many of the specialists in VR and

AR are now concentrated in selected sectors such as gaming. CEE states should think critically about the opportunities and incentives they provide to these professionals to encourage them to apply their skills and knowledge in other domains to expand the pool of practitioners who could support the countries' strategy in the metaverse economy.

Thinking in such holistic terms about the deployment of the metaverse technology will pose a challenge to governments. Close cooperation between key actors and stakeholders in various policy areas will be crucial — hence, the development of metaverse strategies should be collaborative from the very onset and make space for different voices and perspectives to be heard, coming from policymakers but also academics, practitioners, the technology industry and domain experts.

Action points:

- Create a workforce base for the development of the industry by:
 - _ Opening dedicated majors and minors at universities covering metaverse and related technologies
 - _ Including the use of AR and VR solutions in the curriculum of secondary education
 - _ Creating and promoting training programs to upskill and direct the existing tech talent pool into VR and AR and for those already adept at it to explore new areas of application of their expertise and know-how
- Design countrywide strategies for the inclusion of metaverse in public services and programs, including:
 - _ Healthcare
 - _ By finding opportunities for improving remote healthcare
 - _ Focusing on patient monitoring and prevention
 - _ Training doctors and patients in the use of VR tools

- _ Education
 - _ Including immersive teaching in the curriculum
 - _ Enhancing remote teaching for specialised topics
 - _ Include metaverse tools and techniques in IT curriculum starting in secondary schools
- _ Workforce participation enhancement
 - _ Providing clear guidelines for remote work both within the country, EU and other countries
 - _ Creating a separate set of requirements for 100% remote work to cut red tape and remove requirements that do not correspond to remote work
- _ Diversity, Equity & Inclusion (DE&I)
 - _ Investing in segments of the metaverse dedicated to underprivileged groups, including ethnic and language minorities
 - _ Encouraging employment of people with disabilities using remote tools
 - _ Providing equal access to hardware and software via public institutions

3. Build Common Stance in the EU

It is obvious that overarching and groundlaying regulations will be decided at the EU level. While the discussions around EU regulation are usually quite protracted, the ground rules are decided quite early in the process. Therefore, the initiative lies in the hands of the countries that start the discussion. The CEE region can determine how these regulations are formulated so they can fit our local needs.

In particular, it is vital to avoid overregulation that limits innovation, an issue that has sadly led to the fact that none of the big tech companies are in the EU. On the other hand, there is a collective understanding

that we must preserve those values held dear by Europeans, such as privacy, safety and democracy. Both of these goals are at odds and require careful consideration. The approach used for AI – application-based regulations – is appropriate and can be used as a rough guide.

The transformation towards the metaverse is also quite challenging when applied systemically and requires proper infrastructure funding (computing power, broadband access, 5G) and hardware. A CEE coalition can influence the allotment of funds for such purposes, especially for underprivileged regions.

While overregulation is a looming danger, the metaverse could use some common standards. There is very little common ground between various projects, so interoperability is limited. Setting standards of protocols and blockchain interfaces, among others, might foster the growth of the metaverse as companies would be sure that further changes and regulations would not make their solutions obsolete.

- *standards*

The success of the metaverse depends on developing a set of standards that can then be used to create a coherent and interoperable ecosystem. Below, we list some of the areas where common EU standards need to be established in order to unlock the potential of metaverse technology in Europe by providing the necessary frameworks while allowing for technological development and innovation. CEE states can become vocal actors in the EU arena in advocating for the creation of these important standards, acknowledging the need for them in their metaverse strategies and pushing to have a say on how they are shaped and established:

- *digital identity*

We must enable one to verify their identity in a trusted manner so that activities in the metaverse are binding and persons' actions are not disconnected from their actual persona, especially if their actions cause real consequences. This area also covers bot and anonymous

activity, which is a crucial issue regarding the security and general hygiene of the metaverse. These regulations cannot preclude the right to anonymity of users.

- *conducting business working over the Internet*

Current regulations concerning setting up businesses and conducting business in the metaverse are severely lacking. In such a situation, the development of the metaverse is stalled as companies have fears concerning compliance. The same is true about working remotely, especially from outside of the EU. These concerns need to be addressed if opportunities concerning employment and deterring depopulation are to be fulfilled.

- *digital ownership*

The regulations concerning ownership of digital assets, including cryptocurrencies and NFTs, must be addressed to ensure that metaverse transactions are secure and enforceable. Common protocols would also be useful for transferring assets between sub-metaverses.

- *open data*

The success of the metaverse depends on access to data. EU countries should adopt a unified method of data gathering and translation for the metaverse.

About the project

Visegrad Insight is the main Central European platform for debate and analysis that generates future policy directions for Europe and transatlantic partners. It was established in 2012 by the Res Publica Foundation – an independent think tank in Warsaw. Visegrad Insight is dedicated to fostering democratic security in Central and Eastern Europe. With a network of fellows and partners over Visegrad countries, Visegrad Insight gathers expertise in the region in areas such as politics, security, economy and technology, the rule of law or information sovereignty. Our expertise is utilised to create regular articles on visegradinsight.eu and podcasts on major streaming platforms. We are currently engaged in various projects, including a strategic foresight on #EUvalues, with quarterly briefs on democratic security, financed with European means, transatlantic cooperation with National Endowment for Democracy, as well as projects with partners in Visegrad countries and beyond.

Meta builds technologies that bring the world closer together by helping people connect, find communities and grow businesses. Since 2021, Meta has been on a mission to support creators and developers all over the world to help bring the metaverse to life and establish policies and principles to guide our approach to innovation.

Visegrad Insight and Meta (CEE Office in Warsaw) partnered to run a multi-pronged initiative to analyse the economic potential of the metaverse, identify strategies for CEE countries to leverage this new digital frontier effectively, and explore the implications for societal and digital human rights advancements and foster knowledge sharing between policy influencers and decision-makers in the field. To do this, in autumn 2023, the project partners visited 10 CEE capitals: Bratislava, Bukarest, Ljubljana, Prague, Riga, Sofia, Tallinn, Vilnius, Warsaw, and Zagreb. This report is an effort based on those encounters.

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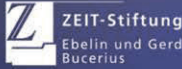
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