Stephens, M., Mathana, Morrow, M. J., McBride, K., Mangina, E., et al. 2024. The Emerging "Metaverse" and Its Implications for International Business. ***AIB Insights***, 24(2). https://doi.org/10.46697/001c.118572.

Article

# The Emerging "Metaverse" and Its Implications for International Business

Melodena Stephens[1][a], Mathana[2], Monique Jeanne Morrow[3], Keegan McBride[4], Eleni Mangina[5], John C. Havens[6], Himanshu Vashishtha[7], Sumaya Al Hajeri[1]

[1] Mohammed Bin Rashid School of Government, UAE, [2] Independent Tech Ethicist, Germany, [3] The Humanized Internet, Switzerland, [4] University of Oxford, UK, [5] University College Dublin, Ireland, [6] IEEE Standards Association, [7] SixthFactor Consulting, Dubai

Keywords: metaverse, digital trade, global value chains, international business, trade-offs, digital business

https://doi.org/10.46697/001c.118572

AIB Insights

Vol. 24, Issue 2, 2024

This article presents information on the metaverse as a digital space, highlighting areas for further inquiry by international business researchers. The metaverse is an overarching virtual platform, much like the Internet, but with a few key differences. The metaverse is expected to be a massively-scaled, hyper-connected network with seamless real time 2D and 3D connection to the physical world via virtual, augmented, neural, and traditional interfaces. Early examples of the metaverse exist like digital twins, gaming, education, and social networking spaces. If the metaverse comes to maturity over the next 10-15 years, it can be a US$ 8-13 trillion economy.

## METAVERSE: A BRIEF INTRODUCTION

Some metaverse technologies (e.g., spatial computing, virtual, augmented, and mixed reality) have been tested across various industry sectors in limited settings. A few examples are hardware sellers and aggregators of experiences (Apple Vision Pro and Oculus Rift), events (Dubai World Expo and the Travis Scott concert in Fortnight), services (Ikea Place App, Mercedes-Benz C-Class virtual navigation), games (Pokémon Go), and digital twins or virtual replicas[1] (city of Singapore; Hong Kong International Airport, Rolls Royce). The metaverse can be exploited not just by digital brands but also by traditional physical brands and nations, changing how international businesses view potential opportunities. For example, Honda partnered with Darewise (Amonica Brands) to leverage its auto innovation in the virtual game space. Barbados is setting up an embassy in the metaverse to overcome the limitations of cost and staffing of physical embassies.

What is the metaverse, and is it relevant to international business? The metaverse is a virtual space where we can live, work, learn, and play by seamlessly transitioning between virtual and real worlds without losing identity and data (if so desired). The metaverse would embed parts of digital economy and trade, provided the technology adoption continues, with greater industry standardization and data integration (see Table 1).

Substantial value in the metaverse will come from exchanging virtual products, such as data in the form of digital artifacts and virtual or immersive experiences. This shift to intangible value may lead to the commodification of data (see Shih, 2018). In this way, Tesla could be perceived as a software and data product packaged in the physical shape of a car.

Several characteristics define the metaverse: seamlessness, transferability, persistence, interoperability, spatiality, and platform-agnostic technology (see Figure 1 for details of definitions and further developments that need to take place). Most existing metaverse technologies are not interoperable; i.e., they cannot be used across different systems or contexts and hence have limited applicability. This fact suggests the need for global standards comparable to those developed for the internet.

The current challenge is understanding *how* the market will evolve; we see many examples of innovations moving across industry sectors. For instance, chip manufacturer NVIDIA moved into the digital twins space; mobile manufacturers and social media companies such as Apple and Meta offer mixed reality headsets; Fortune 500 companies tied up with game developers (Honda, Disney, Netflix); and, in the future, neurotechnology may move from health to augmented reality. Hence, international businesses need to predict the path and pace of technology innovation, its scale of adoption, and the associated costs (all of which are exponential).

a Contact author: Melodena.stephensb@mbrsg.ac.ae

1 Digital twins can be either static or dynamic real-time virtual models developed of physical things like an object, factory, process, or even a city for simulation purposes or operations. The data is collected via sensors, IoT and other mechanisms.

**Table 1. Metaverse versus Digital Economy and Digital Trade**

| Metaverse | Digital Economy | Digital Trade (OECD, 2019: 11) |
|---|---|---|
| All virtual and physical products, data, and identities will be seamlessly interconnected to create fluid movement across both the physical and virtual worlds.<br><br>Can contribute US$ 8-13 trillion by 2030[a] to the global economy. | Refers to all activities that create an economic impact via the internet (including hardware) (about 30% of global GDP by 2030 ~US$ 45 trillion). | All trade that is digitally ordered and/or digitally delivered. The size of digital trade by 2030 would be ~ US$ 4.6 trillion. |

[a] Note that this estimate is very bullish and written before the crypto crash https://www.barrons.com/articles/metaverse-web3-internet-virtual-reality-gaming-nvidia-51648744930

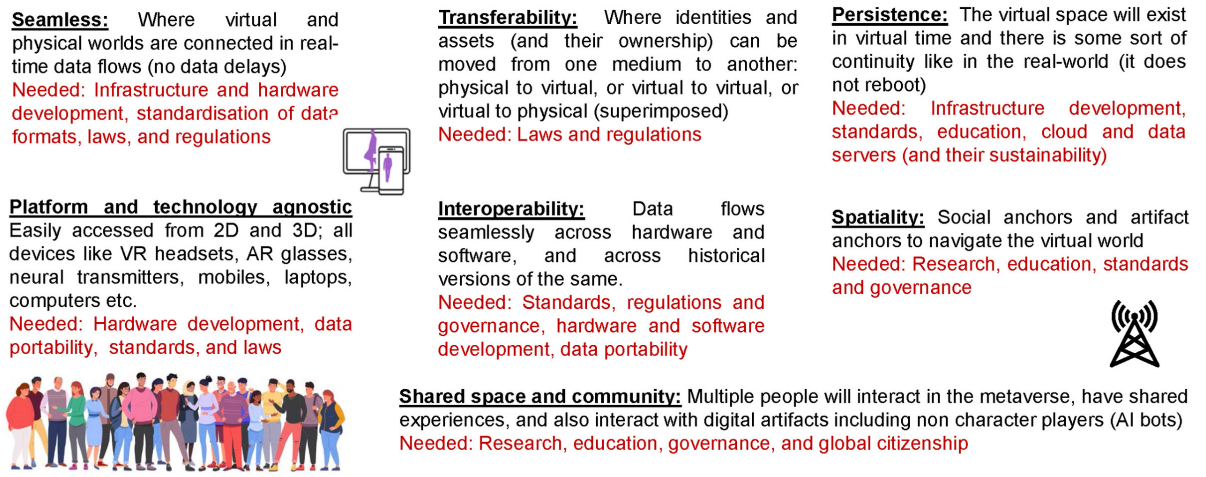



**Figure 1. Characteristics of the metaverse and opportunities for IB**

Source: Authors

## METAVERSE SCENARIOS

Experts believe the metaverse will realize its full potential in 5–15 years. Of course, that means there are three possibilities: the metaverse as a concept will be successful (by 2030), delayed, or unsuccessful (e.g., some pilot versions may exist by 2040, but the regulatory barriers will be prohibitive). What are the necessary conditions that need to be fulfilled for the metaverse to happen? In 2022, only about 150 people could concurrently exist in *3D* virtual environments (Ball, 2022) or 10,000 people (in 2D Zoom)[2]; however, by 2023, Steam reported 3,136 people in a 3D game and 33.6 million players concurrently playing in 2D by January 2024, showing how quickly technology is improving. By 2030, this number is estimated to exponentially increase to 5 billion people (Citi GPS, 2020). Though the metaverse is still limited by internet infrastructure, national laws, data, language, and standards barriers, it can present a global business opportunity due to the fact that trade and people interactions may have fewer 'borders' to cross countries.

For a successful scenario, the following conditions are needed:

1. Hardware: Headsets, neurotechnologies, wearables, IoT, computing power, and data servers need to be affordable and technologically improve. Currently, sustainability, supply chain, and geopolitical tensions associated with hardware and data are substantial. For instance, data centers are responsible for consuming three to five million gallons of water daily and

2 The virtual game world is clever – so the 1 million users in the game Fortnite, according to Mathew Ball, author of the Metaverse, are in 100,000 separate simulations.

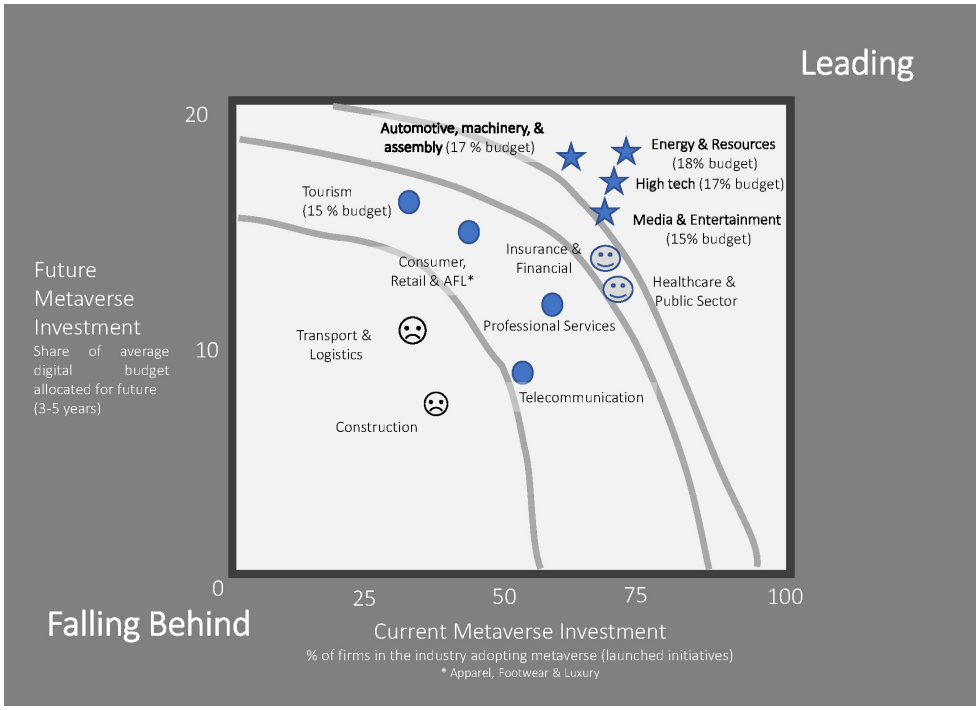



**Figure 2. Current Industries and their Metaverse Investments**

Source: Adapted from McKinsey & Company (2022)

have a carbon footprint equivalent to two to three percent of global emissions (similar to the airline industry) (e.g., Monserrate, 2022). Internet infrastructure still needs to develop so the world will be connected by 5G or 6G (6G launch expected in 2030).

2. Software: Programs, algorithms, and data need to evolve to mimic the real world with accuracy and support diverse metaverse experiences safely and reliably. Though significant advancements have been made with AI like GenAI, there are still challenges.
3. Data management and transfer: As data quality increases (videos and pictures), so do the data file sizes. Technology needs to improve to ensure quality is not lost in transmission, time lags are minimal (think of using metaverse technologies for real-time surgeries), and the increased data storage requirements can be managed. In addition, as physical lives interact more with the virtual world, there is an increased need for cybersecurity and management of its costs. It is estimated that there is one cyberattack every 11 seconds!
4. Regulatory climate: The metaverse will challenge human rights and data privacy, which may spill across borders. With increasing oversight, businesses must prepare for greater regulatory compliance costs which could inhibit innovation.

The world is increasingly multipolar. Nations seem to be falling into four camps: Increased scrutiny (EU's GDPR and AI Act, the UK's Online Safety Law), self-regulations (USA, India, UAE, etc.), collaborative approach (like China's AI Governance initiative), or no policies yet (many of the developing nations fall here). China's strategy could have a "Walmart" effect and it will be interesting to see how it plays out in the AI conflict between the USA and China. The rise of "data embassies" (e.g., India's and Bahrain's intended diplomatic immunity for data servers), nations' abilities to act as data aggregators (e.g., India's DPDT Act via DEPA Framework, which is different from the model used by the U.S. where private companies are data aggregators), and data localization policies make it a complex space for businesses operating across national borders to navigate.

Despite the uncertain regulatory terrain, many companies make early bets on the metaverse. The leading adopters have been energy and resources, automotive, machinery and assembly high-technology, media and entertainment, healthcare, and the public sector (see Figure 2). The first three have used metaverse technologies to manage their production processes. The following three industries on the list have focused on data and services.

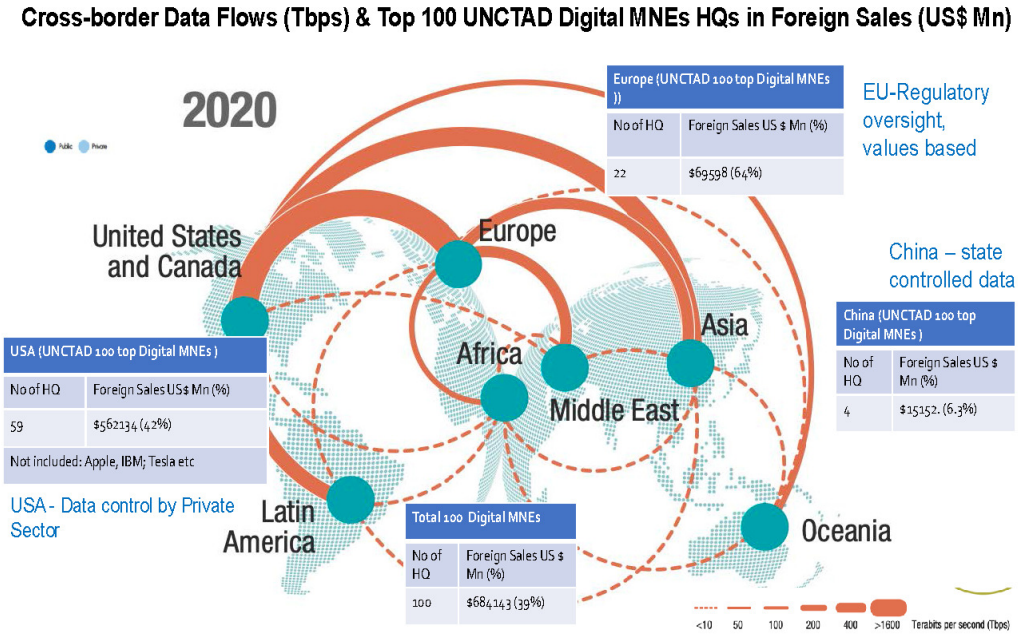
By 2025, data transfers will be worth approximately US$ 11 trillion. The industries most resistant to fully embracing metaverse opportunities have been transportation, logistics, and construction, which all need global data flows (see Figure 3A and 3B). However, data flows are tempered by sovereign control, state security, and national competitiveness, leading to increasing data localization and restrictions. The metaverse's problems are similar to those AI companies that aggregate an individual's data inputs, i.e., privacy and bias.

Other metaverse challenges are growing antitrust issues (e.g., EU, UK, and U.S.'s failed antitrust action against Microsoft regarding its US$ 75 billion acquisition of Activi-

| Policy | Data Protection Regulation | Cybersecurity Regulation | Cross-border data transfer regulation | Data protection authority governance | Data localization requirements |
|---|---|---|---|---|---|
| No of policy instruments (changes) | 938 | 386 | 197 | 73 | 36 |
| No of policy instruments (implemented) | 664 | 271 | 138 | 48 | 30 |

**Figure 3A. Global Policy Changes in Data Regulations 1 January 2020 to 18 July 2023**

Source: Compiled from Digipolicyalert.org [Accessed 18 July, 2023]




Sources: Complied from Digipolicyalert.org [Accessed 18 July, 2023]; OCED. 2019. Trade and cross-border data flows; UNCTAD. 2017. Information Economy report; Image adapted from UNCTAD 2021. Digital Economy Report

**Figure 3B. Cross-border regional data flows and MNE HQs**

sion), IP infringement concerns (e.g., deep fakes, and lawsuits such as Getty Images vs. Stable Diffusion and New York Times vs. Open AI and Microsoft), and new regulations. The evolution of the metaverse is complex, redefining the power balance between large platform-owning MNEs and nation-states. This situation is similar to the early ICT evolution, initially dominated by Japanese and European manufacturers and later overtaken by U.S. cloud computing (see Kushida, 2015). Despite the challenges, there is significant investment in metaverse technologies, which impact the way we do business, work across countries, and consume products.

## IB TOPICS

Trade in the metaverse likely means we need to rethink the impact of physical borders (which could be algorithmically decided) and understand the trade-offs and ethicality of these decisions based on privacy, sustainability, fairness, power, and future value (e.g., Casalini & González, 2019; Stephens, 2023; Van Dan Meerssche, 2022).

### DIGITAL VS. GEOGRAPHIC BORDERS

Trade in the metaverse results in the transfer of virtual assets across MNEs, individuals, Decentralized Autonomous Organizations (DAOs),[3] government-owned platforms, and other entities. Trade could involve moving an asset in

3 Organizations are created using a distributed ledger as a contract (smart contract or a blockchain) by which members abide and pursue common goals. As of now, they do not need to conform to normal shareholder laws, as governance is assumed to be decentralized.

| What is a border in a digital space? | What are location choices? | What are network choices? |
|---|---|---|
| • Geographic-geographic (determined by national regulations, trade deals, counter-trade negotiations)<br>• Geographic-virtual (determined by infrastructure, hardware, software and data interoperability knowledge, language)<br>• Virtual-virtual (IP, hardware, software and data interoperability) | • Sourcing of hardware (make, buy or source via M&A)<br>• Sourcing of software (developing, costs, and data restrictions)<br>• Sourcing of data (privacy and regulations)<br>• Storing of data (security, data laws, sustainability, data access and confidentiality)<br>• Storing profits (form and place)<br>• State support and power in international markets<br>• IP protection<br>• Knowledge of Investor and access to capital<br>• Sourcing of customers | • Scale of customer acquisition<br>• Multiplier effect of technology acquisition<br>• Multiplier effect of market growth<br>• Scale of data storage and management<br>• Access to cybersecurity management and scalability<br>• Government policy shaping<br>• Scale of skill redundancy and backups<br>• Scale of contingency management for negative shocks |

**Figure 4. IB Decisions in the Metaverse**

Source: Authors

Minecraft (owned by Microsoft, U.S.) into FIFA Online (owned by Garena, Singapore). It could be driving a digital twin car developed and owned by the Mercedes-Benz Group AG (Germany) into Fortnite (owned by Epic Games, U.S.), parking in a space owned by a private server (belonging to an individual in Estonia), or hosted on a government server. The Barbados, South Korea, and Dubai governments are already active in this arena. This may mean extending the concept of IB, as geographic borders between countries and the virtual worlds blur and either mirror the physical world, distort it, or new virtual borders arise. Would the country of origin still be relevant for digital artifacts in these complex digital spaces?

Liability of foreignness (LoF), are the costs foreign firms incur in a new market that their local counterparts do not (Zaheer, 1995: 343). LoF may decrease when the firm is based in Vegas City, in a popular 3D virtual place like Decentraland, as opposed to London City in Second Life because of greater interoperability. In the physical world, the location base is tempered by scarcity; however, the virtual world has no scarcity issues. Yet, in 2021, a virtual property sold for US$ 2.4 million. The concept of LoF in digital worlds may not have the same characteristics or constraints as LoF in physical worlds, which needs unpacking (see Figure 4).

IB scholars will likely need to revisit the concept of liability of distance in light of digital borders. Take the LoF example of customs duties: A World Trade Organization (WTO) e-commerce moratorium issued in 1998 exempts digital products from customs duties. This is a thorny issue for nations as customs duties are often used to manage trade barriers and revenue streams. How do firms navigate the evolving future?

## GLOBAL VALUE CHAINS

Global Value Chains (GVCs) affect the scope of digital business operations (Kano, Tsang, & Yeung, 2020: 601). For example, the port of Rotterdam (Netherlands) plans to create a virtual real-time operational replica of its port or a digital twin by 2030 (Port of Rotterdam, 2024). Merck and Mercedes Benz (both German) and the cities of Singapore and Shanghai (China) also have digital twins. In the metaverse, the Port of Rotterdam could be connected to an MNE using real-time data (e.g., RFID chips, smart cities data, the internet of things, and digital twins) to plan, process, and manage supply chains worldwide at a scale not previously available. By looking at the network effect both in-country and cross-country as a form of firm-specific advantage, metaverse firms may be able to leverage user bases (see Stallkamp & Schotter, 2021) and provider bases (national or global) across their value chain. The location decisions of users and suppliers may have different implications for IB digital strategies than for physical products.

In terms of pricing decisions, in virtual entertainment spaces, micro-transactions are 85% of all transactions (L'Atelier BNP Paribas, 2024). The metaverse is thus likely to accelerate the growth of micro-multinationals and SMEs that operate globally, primarily with digital technologies. The methods of making money via microtransactions, barter (exchange of virtual products and currencies), or appreciation of virtual assets is a future research area. It is estimated that barter (a type of countertrade) is 30-40% of global transactions (Uyan, 2017). In terms of nonmarket strategies, MNEs are asking for data and are promising FDI or IP as barter (e.g., the strategic partnerships/acquisitions of LLMs by Microsoft – Open AI in the USA, Mistral in France and G42 in UAE). Individuals already trade data, copyrights, and identities for free services. However, a

growing focus is on taxing online platform marketplaces, thus increasing business costs. Currently, the Global Tax Agreement does not consider microtransactions or barter and the associated value appreciation in virtual marketplaces. These developments can affect IB strategy.

## CONCLUSION

The metaverse (whether it succeeds or fails) provides both research and teaching opportunities. The above discussions align with calls by scholars such as Alcácer, Cantwell and Piscitello (2016) and Meyer et al. (2023). The concept of international trade may need to be extended to the metaverse - across virtual boundaries, though these boundaries may not align with physical geographic borders. (e.g., an avatar skin being traded from one virtual world, called Dubai, to another virtual world the same name as Dubai, without physically being based in Dubai). The metaverse is a constantly evolving digital space, and qualitative studies may provide the granular data needed to understand the challenges of firms trading across both geographic and virtual borders. We hope this paper will start a rich debate on digital spaces such as the metaverse, reinforced by the AIB's newly-formed Digital Globalization Special Interest Group.

## ACKNOWLEDGEMENTS

This paper is possible because of the patient mentorship and thought-provoking comments of the anonymous reviewers and the Editors. Our journey began at the Miami AIB Annual Conference at the AIB Insights paper development workshop. Special thanks especially to the Editor, Prof. Elizabeth Rose who has pushed us to unpack the metaverse and link it to IB. A special shout out to the IEEE community that are unravelling AI ethics and building standards for the same.

## ABOUT THE AUTHORS

**Melodena Stephens** has three decades of international senior management experience. Her areas of research and consultancy are strategy, foresight, innovation (agile governance, policy, and market development), nation branding, and crisis management. Her latest book is "AI Enabled Business: A Smart Decision Kit." Melodena is the founder and board member of the Academy of International Business – Middle East North Africa Chapter (AIBMENA). Her committee work includes the Council of Europe, Agile Nations, The Digital Economist, and several IEEE SA committees on AI ethics.

**Mathana** is a Berlin-based tech ethicist researcher and philosopher. Their area of interest is creating a sustainable vision of the future by developing human-centric approaches to emerging technology. As co-chair for the IEEE's Global Initiative for Ethical Extended Reality, Mathana helped lead one of the world's largest ethics-focused AR/VR initiatives. Mathana has sat on a number of technical standards working groups across the AI and robotics domains.

**Monique Jeanne Morrow** has 25+ years of experience as a global technology leader. Her focus is on extensions of Distributed Ledger Technology and other emerging components of Blockchain technologies. She worked in AMD, Ascom Hasler, Swisscom, and Cisco. Monique is an Independent Director on the Hedera Hashgraph Board of Directors. Other committees work includes IEEE Ethics in Action, Co-Chair of GSMA- DLT group, and WEF Data Policy Council. She is one of the top 100 Women in Cybersecurity in Europe.

**Keegan McBride** is a Lecturer in AI, Government, and Policy, and the Course Director of the Social Science of the Internet MSc program at the Oxford Internet Institute. He conducts research on how new and emerging disruptive technologies are transforming our understanding of the state, government, and power. He has a particular interest in the digitalization of the public sector, global digital infrastructure, digital innovation, and U.S.–China digital competition.

**Eleni Mangina** is Professor at the School of Computer Science. Her lab operates at the intersection between applied Artificial Intelligence (VR/AR; Data Analytics; UAVs; Information Systems) and a interdisciplinary applications (i.e. Energy Sector and Educational Systems with XR). She has won multiple grants: like H2020 projects, HORIZON Europe and Erasmus+KA2. Eleni has 200+ peer-reviewed articles. She is a senior member of IEEE, Executive Editor for the publications of the IEEE Global Initiative on XR Ethics and Chair of IEEE P7016.1 standards.

**John C. Havens** is the Director of the IEEE Planet Positive 2030 program, and recently led IEEE's largest body of work on AI Ethics resulting in the compendium document, Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems, that inspired the IEEE 7000 Standards Series. His books: Heartificial Intelligence: Embracing our Humanity to Maximize Machines and Hacking Happiness: Why Your Personal Data Counts and How Tracking It Can Change the World.

**Himanshu Vashishtha** is fascinated with the human mind and the choices it makes. He is a market researcher with 30 years' experience in shaping marketing strategy for global brands. Post his last role as head of Nielsen for their Middle East and Africa businesses, he set up SixthFactor Consulting, to provide clients with clarity and predictability about consumer behavior to help improve their profitability by improving their probability of success.

**Sumaya Al Hajeri** led the Governance and Data section at the Minister's Office of AI, Digital Economy, and Remote Work Application. Previously, she was Head of Space Policies and Regulations at the UAE Space Agency. She contributed to the UAE's participation in the UN Committee on

the Peaceful Uses of Outer Space (COPUOS) and the UN Office of Outer Space Affairs, and helped establish the Federal law No (12) of 2019 for the UAE Space Sector, among other strategies and policies.

Submitted: November 09, 2022 EDT, Accepted: May 21, 2024 EDT

# REFERENCES


Alcácer, J., Cantwell, J., & Piscitello, L. 2016. Internationalization in the information age: A new era for places, firms, and international business networks? ***Journal of International Business Studies***, 47(5): 499–512.

Ball, M. 2022. ***The metaverse and how it will revolutionize everything***. Liveright Publishing. https://doi.org/10.15358/9783800669400.

Casalini, F., & González, J. 2019. ***Trade and cross-border data flows***. OECD Trade Policy Papers: OECD. https://doi.org/10.1787/b2023a47-en.

Citi GPS. 2020. ***Metaverse and money: Decrypting the future***. https://ir.citi.com/gps/x5%2BFQJT3BoHXVu9MsqVRoMdiws3RhL4yhF6Fr8us8oHaOe1W9smOy1%2B8aaAgT3SPuQVtwC5B2%2Fc%3D.

Kano, L., Tsang, E. W., & Yeung, H. W. C. 2020. Global value chains: A review of the multi-disciplinary literature. ***Journal of International Business Studies***, 51: 577–622.

Kushida, K. E. 2015. The politics of commoditization in global ICT industries: A political economy explanation of the rise of Apple, Google, and industry disruptors. ***Journal of Industry Competitiveness and Trade***, 15: 49–67.

L'Atelier BNP Paribas. 2024. ***The virtual economy***. https://atelier.net/virtual-economy/.

McKinsey & Company. 2022. ***Value Creation in the metaverse: The real business of the virtual. world***. https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/value-creation-in-the-metaverse.

Meyer, K. E., Li, J., Brouthers, K. D., & Jean, R. 2023. International business in the digital age: Global strategies in a world of national institutions. ***Journal of International Business Studies***, 54: 577–598.

Monserrate, S. G. 2022. ***The cloud is material: On the environmental impacts of computation and data storage***. MIT Case Studies in Social and Ethical Responsibilities of Computing. https://doi.org/10.21428/2c646de5.031d4553.

OECD. 2019. ***Handbook on measuring digital trade***. https://www.oecd.org/sdd/its/Handbook-on-Measuring-Digital-Trade-Version-1.pdf.

Port of Rotterdam. 2024. ***The Digital Port***. https://www.portofrotterdam.com/en/to-do-port/futureland/the-digital-port.

Shih, W. 2018. Why high-tech commoditization is increasing. ***MIT Sloan***.

Stallkamp, M., & Schotter, A. P. 2021. Platforms without borders? The international strategies of digital platform firms. ***Global Strategy Journal***, 11(1): 58–80.

Stephens, M. 2023. Metaverse and trade-offs. ***California Management Review***. https://cmr.berkeley.edu/2023/01/metaverse-and-trade-offs/.

Uyan, O. 2017. Barter as an alternative trading and financing tool and its importance for businesses in times of economic crisis. ***Journal of Economics Finance and Accounting***, 4(3): 282–295.

Van Dan Meerssche, D. 2022. Virtual borders: International Law and the elusive inequalities of algorithmic association. ***European Journal of International Law***, 33(1): 171–204.

Zaheer, S. 1995. Overcoming the liability of foreignness. ***Academy of Management Journal***, 38(2): 341–363.