

# Governing The Metaverse

Governance Will Be Key To Driving Adoption And Development Of The Metaverse



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# Table of Contents

## Topics

1.	Summary And Introduction	01
2.	The Basics And Benefits Of The Metaverse	03
	What Is The Metaverse?	03
	Applications And Benefits	05
	The Potential	09
3.	How Effective Governance Can Improve Efficiency	11
	Interoperability	12
	Security And Safety	14
	Privacy	15
	Law	16
	Competition, Innovation, And Incentives	17
4.	Finding The Right Way Forward For Governance	19
	Standards	20
	Laws And Regulation	20
	Policies And Incentives	21
	Infrastructure	22
5.	Metaverse Adoption: The Case For Government Intervention	23

# 1. Summary And Introduction

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The Metaverse may still be ‘under construction,’ but it has the potential to make a major impact on business and society, with opportunities already for the taking. While there is no single definition of this emerging world, the Metaverse can be understood as the next iteration of the Internet or the future of computing. It is a virtual shared space, where physical reality is virtually enhanced and converges with digital reality. The possible uses and applications are almost limitless, but for the Metaverse to truly thrive, suitable governance will be critical, and the roles that social institutions and governments play need to be clearly defined.

The Metaverse has been inescapable in the media ever since Facebook rebranded itself as Meta in October 2021. Today, while independent commentators clearly recognize its huge potential to transform business and society, there are differences of opinion about the scale of its impact and the speed at which it will be realized. Offering one perspective, an Arthur D. Little (ADL) report authored by Albert Meige suggests that while the impact of the Metaverse will be profound, it could take up to a decade for its full potential to be realized.<sup>1</sup>

Yet, significant opportunities already exist and are likely to increase over the coming years in fields such as energy and utilities, healthcare, manufacturing, education, archaeology, and more, compelling businesses and governments to take a proactive approach to engaging with the Metaverse. Moreover, as it evolves, governments will need to stay keenly aware of how it will shape economic and social interaction, and how failing to keep up will result in loss of opportunities to tap into the Metaverse’s potential to impact millions of lives through public services.



But there is a caveat. Just because a new technology is available, does not mean that it will take off in the market, and herein lies the importance of governance. The existence – or lack – of robust governance, will fundamentally affect the speed and scale of Metaverse adoption. If the Metaverse is to become the future version of the Internet, as experts and observers contend<sup>2</sup>, then several important issues must be addressed relating to how this new ‘verse’ should be governed. Such issues include cross-border regulations, the boundaries of invasion of privacy, development of infrastructure, and the digital divide, among many others.<sup>3</sup>

Consideration of these issues is especially important given that a mature Metaverse would impact daily life in more extreme ways than the Internet already has. In fact, governments can learn major lessons from the growth of the Internet and how it became not just a part of daily life, but also a means of governance across the world. Notably, the Internet led to the introduction of regulations to the virtual space to ensure smooth governance and reactive measures to avoid invasion of privacy (e.g., GDPR guidelines in the EU). If the Metaverse is left unregulated, bigger and more complex issues could emerge further down the line, just as they did for the Internet.

This report provides an overview of some of the key governance issues and suggests priorities for attention by government decision makers. Tech firms, multinational corporations, and forward-thinking nations are already shaping the Metaverse, but as it evolves, so too does the role of government – a fact that could alter trajectories and set the Metaverse on a new path.

## 2. The Basics And Benefits Of The Metaverse

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### What Is The Metaverse?

The Metaverse has the potential to become the future version of the Internet, blending the frontiers between reality and virtuality. It marks the convergence of immersive spaces, collaboration platforms, and social experiences, while leveraging the creator economy<sup>4,5</sup>. The four main properties distinguishing it from the Internet of today are<sup>6</sup>:



<sup>4</sup>ADL, 2022

<sup>5</sup>Science Direct, 2022

<sup>6</sup>Blockchain council, 2023

# What Is The Metaverse?



**Immersion:** The Metaverse involves a spectrum of immersivity from augmented and virtual reality to full immersion, and it will increasingly involve all of our five senses. The fidelity – high or low – of the immersive experience will be defined by how well that experience is perceived by all senses combined, and how differentiable the object is from its surroundings.<sup>7</sup>



**Interactivity:** Real-time interactions between people are at the heart of the Metaverse – the virtual world hosts real relationships



**Persistence:** The Metaverse will continue to exist and develop internally as a place to be explored and experienced even as users leave the space and are no longer present



**Decentralized:** A single system does not have access to the Metaverse. Rather, it is dispersed along multiple platforms

The potential value of the Metaverse lies in the implications and tangible benefits for the physical world. Rather than stifling the physical world by layering the digital world on top, the Metaverse has the potential to create a harmonious and highly nuanced interplay between the two. Take the case of medical surgery; through the Metaverse, it will be possible for a doctor in the United States to perform surgery on a patient in Dubai. Using Metaverse technology that extends beyond artificial intelligence, the doctor could work on a synthetic body, with each precise movement replicated on the patient lying on a hospital operating table thousands of miles away.

More broadly, significant value lies in the creation of an extended reality across combinations of real and virtual experiences. Already, there are multiple existing use cases such as Minecraft or Fortnite, which are considered to be ‘real’ Metaverse gaming worlds. But of course, reflective of the nascent nature of the Metaverse itself, many of the key technologies are still immature and the quality of the virtual experience is limited.<sup>8</sup>

<sup>7</sup>Towards large scale high fidelity collaborative augmented reality, Science Direct, 2022

<sup>8</sup>The Washington Post, 2020

## Applications And Benefits

For consumers, the Metaverse has multiple applications around entertainment, experiences, digital assets, social activities, and commerce, including but not limited to:



New digital assets, virtual try-ons/shops/auctions/retail experiences, and new payment models



Enhanced product customization and comparison through digital modeling and improved customer tracking



Virtual events/experiences/simulators, and new virtual worlds/virtual tourism



E-sports, music, and in-journey entertainment



Virtual healthcare and financial services provision

## Applications And Benefits

Extensive business applications already exist, with typical examples including:



**General:** Virtual tools for training, meetings, collaboration, and workshops



**Manufacturing:** Digital twins of factories and plants to optimize design, operations, and maintenance



**Healthcare:** Remote healthcare provision, digital human simulations for therapy testing, and faster and cheaper drug discovery



**Energy And Utilities:** Digital twins of infrastructure assets, and modeling and visualization of operating data for real time optimization



**Financial Services:** Decentralized finance approaches (e.g., NFTs, blockchain), new financial products, and new security approaches



**Education:** Campus digital twins, enhanced virtual training, and more realistic simulations

## Applications And Benefits

Meanwhile, for governments and public administrations the Metaverse offers further generational improvements in the benefits already being enjoyed through digitalization. For example:



Enhanced urban planning and design



Optimization and better management of infrastructure including energy and transport



Improved administrative efficiencies



Better citizen service experience

To create impact in the public sphere, focus should be directed at four major domains: food, housing, healthcare, and education. In particular, the Metaverse can democratize education and healthcare by reducing costs and facilitating access. In turn, by nurturing an educated and healthy society, governments can empower people to resolve issues of food security and housing infrastructure for themselves. Notably, market research company MRFR expects global healthcare in the Metaverse to reach \$5.373 billion by 2030, growing at 48.3% CAGR between 2024-2030.<sup>9</sup>

# Applications And Benefits



Beyond health and education, a good example of the Metaverse in action is Dubai Virtual Commercial City (VCC), which provides a Virtual Company License to companies as part of its campaign to develop Dubai into a commercial hub for trade, innovation, and e-commerce with zero tariffs, taxes, or quotas on imported goods. The initiative also presents opportunities to legal entrepreneurs to take their innovative ideas and establish themselves in an emerging market.<sup>10</sup>

As another example, the UAE's Ministry of Health and Prevention (MOHAP) became the first government health body in the Middle East region to launch a virtual customer happiness center. Customers can visit 3-D offices virtually and enjoy easy access to services such as medical license renewal, payment for medical facilities, and appointments for diagnostics.

<sup>10</sup>VCC, 2022

## The Potential



Alongside the benefits mentioned above, over the next few years, the so-called 'Industrial Metaverse' is expected to develop much further to offer truly transformative tools for the strategic management of business (MIT Technology Review, 2022).<sup>11</sup>

The Industrial Metaverse will bring together physical, digital, and human components for industrial applications, allowing interaction with physical industrial environments that can be controlled and communicated with by people. These tools are likely to have the potential to simulate not just a plant or a factory, but the complete end-to-end industrial system of a business, including all assets, processes, and functions, as well as the wider ecosystem, including supply chains and logistics. Crucially, such a capability would enable true data-driven 'what-if' decision making for the very first time.



The business benefits of a whole-system digital twin capability are hard to assess, but it is safe to say that it would constitute a major step change in the effectiveness and efficiency of business management.

It would also be a powerful tool to help businesses make the green transition, as it enables much better management of circularity, sustainability along the supply chain, and waste reduction.

## The Potential



In addition to the potential value-add to business management, the Metaverse represents an inescapable financial value too. There are widely varying estimates of the market potential of the Metaverse by 2030,

typically ranging from trillions of US dollars to hundreds of billions.<sup>12</sup> Given this range, putting a figure on the scale of the benefits is difficult at this stage, but it is possible to envisage the creation of extensive new market space and double-digit improvements in effectiveness and efficiency.



That said, there are still huge technical challenges to be overcome before the full potential of the Metaverse can be realized. These challenges exist at each layer of the technology stack, from improved

human-machine interfaces at the consumer experience layer to order-of-magnitude increases in computing power at the infrastructure layer. Making the required progress necessitates a coordinated effort, not just from investors and key players in the Metaverse value chain, but also from governments in the form of policies, regulation, standards, and incentives, as discussed later in this report.

### 3. How Effective Governance Can Improve Efficiency

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One of the basic characteristics of the Metaverse is that it cannot be centrally controlled. It leverages the ‘creator economy’ and is dependent on Web3<sup>13</sup> decentralized digital technologies, such as blockchain and non-fungible tokens (NFTs), to enable transactions to take place in a virtual or augmented reality world. In a Metaverse context, decentralization is of course essential, but it poses clear challenges for governance. Global experience vis-à-vis the growth of the Internet illustrates the need for good governance to manage multiple issues. As the next iteration of the Internet, the same applies to the Metaverse, and it is incumbent on all stakeholders including governments, regulators, businesses, and societies to take collective action and tackle the key governance issues head on.

Prime among the issues are interoperability, security and safety, privacy, law, incentives, and competition. Each is a critical component of the governance matrix and the magnitude of the work involved is hard to overstate.



### 3.1 How Effective Governance Can Improve Efficiency

## Interoperability

Achieving full interoperability is essential for the Metaverse to have a viable future. Currently the Metaverse is in the phase of ‘walled garden’ proto-metaverses, much like the Internet in the mid-1990s, but progress has begun from an industry perspective with the formation in June 2022 of the Metaverse Standards Forum. The forum aims to foster the development of interoperability standards for an open and inclusive Metaverse, and accelerate their development and deployment through pragmatic, action-based projects.<sup>14</sup> An industry-wide effort, its membership includes leading players such as Google, Meta, Microsoft, and Nvidia, as well as standards groups such as Khronos and large gaming and software players like Epic.

As industry leaders rally around the same mission, two of the key interoperability issues to be addressed are data interchange and standards for how virtual worlds are created. But this is just the tip of the iceberg – interoperability standards will be needed across all layers of the Metaverse architecture:

- **Experience Continuum:** The user layer that brings together use cases, experiences, and business models
- **Extended Reality:** The immersive representation that augments or replaces reality
- **Human Machine Interfaces:** The layer that allows humans to perceive and interact with extended reality
- **World Engine:** The software allowing the realization of virtual worlds, virtual objects, digital twins, and avatars
- **Infrastructure:** The physical infrastructure, including network, computing power, and storage, necessary for the Metaverse
- **Critical Enablers:** Essential technologies such as the Internet of Things (IoT), blockchain, cybersecurity, and AI

<sup>14</sup>Metaverse Standards Forum, 2022



# Interoperability

Interoperability itself also embodies a spectrum that ranges from complete consistency of standards across the entire system at all layers, to targeted interoperability for only certain domains – such as connectivity – with the freedom to create proprietary approaches. In keeping with the fundamental ethos of the Metaverse, managing this broad spectrum and achieving interoperability will likely require coordination and collaboration between stakeholders, as opposed to top-down governance.

However, intergovernmental intervention may be required if the market is unable to deliver the necessary outcomes. Our experience with the Internet shows just how easy it is for certain players to gain huge power and dominance through technological advantage – hence the drive towards a decentralized Web3 model. And there are inherent economic conflicts of interest in the development of key Metaverse technologies in terms of who pays and who benefits. This is best illustrated by the well-documented conflicts between tech giants such as Meta and the architects and investors behind Metaverse infrastructure. While platforms such as Facebook stand to make significant financial gains from the Metaverse, they arguably do so at the cost – quite literally – of the companies and governments currently investing in its growth. With this in mind, there should be a push towards incentivizing, encouraging, or mandating social media players and other tech giants to make a more meaningful contribution to the Metaverse's development.



### 3.2 How Effective Governance Can Improve Efficiency

## Security And Safety

The security and safety issues relating to the Metaverse are similar to those of the Internet, except with significant additional risk and complexity. Cybersecurity risks are already increasing rapidly in line with the continuing advance of digitalization, leaving energy, transport, and financial infrastructures especially vulnerable. Cyber fraud and misinformation have also been increasing sharply, and the availability of viable quantum computing devices in the coming years could pose additional threats to existing encryption methods. Compounding the challenges, the Metaverse poses further levels of safety risk over and above the Internet due to the increased depth and breadth of day-to-day virtual interaction. Examples include impersonation and identity theft (i.e., ensuring that avatars are who they appear to be), abuse, terrorism, theft, and sabotage, including hacking of digital twin operations.

With the Metaverse still at the nascent stages of development, determining what constitutes a 'safe' environment in the extended reality world remains a challenge. What is clear, however, is that there is a role for governments to work with industry and society in ensuring that the right controls are in place, whilst avoiding barriers to personal liberty, commerce, innovation, and freedom of speech.



### 3.3 How Effective Governance Can Improve Efficiency

## Privacy

Data privacy is already a huge issue for governance of both the Internet and the physical world, and existing regulations such as the EU's General Data Protection Regulations (GDPR) are largely transferable to the Metaverse extended reality domain. Yet in the privacy stakes, the Metaverse presents significant additional risks, primarily relating to personal data and data breaches more broadly. Again, the role of government is clear: international coordination on data sharing and privacy is currently poor, and governments have the power to take a lead role in addressing future needs.

As governments set out to address these privacy issues and meet needs, three lessons from history can help shape the plan of action:

- 1. The Benefits Of An Efficiently Managed Monopoly:** The balance between regulation and competition needs to be maintained. Here, the key is to create an efficiently managed monopoly for the Metaverse that would reduce the duplication of efforts, investment, and infrastructure, ultimately driving down costs for developers and end users alike. This requires viewing the Metaverse and the telecom sector as providers of essential services, much like highways, water, and energy supply. Decades ago, when road networks and utilities infrastructure were being developed, service provision was monopolized and often subsidized, and the model worked. It encouraged people to use these services, with significant indirect benefits to government and private-sector stakeholders. By contrast, the telecom sector has long been fragmented and rife with competition that has driven prices up without improving access.
- 2. 5G Development Requires Commitment From Telecoms:** The development of 5G infrastructure requires a commitment of more than 1000x the current computational power. With this in mind, contributions from telecom companies towards this goal will need to be incentivized by governments, as they alone will not be able to bear the cost.
- 3. Addressing The Cost/Benefit Imbalance:** As discussed above, those who stand to gain from the Metaverse are not necessarily contributing to its development. To right this, global tech giants like Facebook, YouTube, and other social media platforms should increase their contributions towards the development of the Metaverse.



### 3.4 How Effective Governance Can Improve Efficiency

## Law

Underpinning the issues outlined above is the need for a legal framework that covers the Metaverse. There may be new categories of virtual crime that need to be legislated for, such as offences committed by avatars, and there are important issues to address relating to ownership, property rights, and copyright for digital assets. For example, if someone buys a digital piece of art, what rights does that give them? And in the case of digital property, how should existing real estate laws be adapted for the Metaverse? The adoption of NFTs and crypto-based payment forms also needs further regulation and requires the development of targeted legal frameworks. The recent FTX collapse is a good illustration of the current gaps, with the extent of customer losses still unknown.<sup>15</sup>

<sup>15</sup>Reuters, 2022



## Competition, Innovation, And Incentives

Existing antitrust laws that encourage competition will apply in the Metaverse just as they do in other realms of real and digital life. However, ensuring adequate competition in the Metaverse could be complicated given the need for interoperability. For instance, the owner of one or more dominant platforms could abuse their position by imposing uncompetitive rules on other players. With this in mind, governmental cooperation will be highly valuable in ensuring that competition principles are upheld. As discussed above, an efficiently managed monopoly, overseen by government, could be one effective way of managing Metaverse competition and keeping a handle on costs, with benefits for both business and society.

Setting the right conditions to drive and incentivize innovation is another role for government in the real world that applies equally to the Metaverse – and the same principles and sets of tools apply. These include, for example: tax breaks for targeted R&D programs, setting favorable regimes to encourage investment, funding or co-funding longer-term research, training and capability development, innovation-friendly intellectual property rules, and encouragement of innovation ecosystems through science parks and other initiatives.





### 3.5 How Effective Governance Can Improve Efficiency

## Competition, Innovation, And Incentives

A further role for government could be to encourage and incentivize participation in, and adoption of, the Metaverse. Even at this early stage of its evolution, there are many use cases that demonstrate its benefits, such as BMW's iFactory program, which involves creating digital twins of all its production locations to enhance the efficiency and effectiveness of its automotive manufacturing operations.

One of the inherent characteristics of the Metaverse is that its attractiveness and effectiveness will increase in step with rising participation. In other words, future development and adoption are likely to follow an exponential curve. If the current rate of adoption based on the prevailing market dynamics is regarded as too slow, it would be possible to make an economic case for incentivization measures to drive faster adoption and edge closer to the steep part of the growth curve.

## 4. Finding The Right Way Forward For Governance

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In the field of significant new technology development, governance and regulation tend to trail the progress of the technology itself. Obvious examples of this include drone technology where regulation is only now being put in place, and of course, the Internet, where further regulation is still ongoing to this day. However, taking a passive and reactive stance on governance is inadvisable when the potential impacts, benefits, and risks are as huge as those associated with the Metaverse. With the stakes high, governments and regulators have a role to play in collectively steering governance in the right direction. To this end, government actors can begin by focusing on the following priorities:



**1. Standards:** Although it is still at an early stage, the party leading the development of Metaverse standards – specially interoperability – is the industry itself. To an extent, this is how it should be, but it could ultimately be difficult to resolve all inherent conflicts of interest without the involvement of international governments. In fact, at the recent World Economic Forum (WEF) conference at Davos, it was suggested that the WEF, which includes representatives from numerous national government ministries and institutions as well as the business world, could act as a ‘world government’ in the development of Metaverse standards. While this could be a satisfactory solution for some, others may see WEF as too elite to perform this role in the interests of all segments of society. Whatever the final outcome, it will be important for national governments to engage in international discussions on Metaverse standards.



**2. Laws And Regulations:** Introducing appropriate laws and regulations will be vital to encouraging participation and investment in the Metaverse by consumers and industry players. As touched upon earlier, priority areas for attention include safety, cybersecurity, privacy, data management, asset ownership, contracts, and crypto commerce. A further key consideration here – and one which will require international cooperation – is how to deal with national boundaries, which have an unclear meaning in the Metaverse.



**3. Policies And Incentives:** Governments should consider where policy mechanisms and incentives are needed to drive development and adoption of the Metaverse, and on this front, several governments are already taking action. For example, Dubai's Virtual Assets Regulatory Authority (VARA) has become the world's first regulator that aspires to provide a framework for financial entities to operate in the Metaverse, including, banks and state services. The framework would handle 7% of global crypto transactions and make it the third largest crypto market in the Middle East, Africa, and South Asia (MEASA) region.<sup>16</sup>

In another UAE example, Dubai Municipality has announced a partnership with private companies and investors to create a futuristic, human-centered city in the Metaverse called 'One Human Reality', which will act as a testbed for smart contracts, among other things. Meanwhile, the South Korean government has announced a \$186.7 million package to simulate a government led Metaverse ecosystem, with a focus on encouraging young talent and fostering a culture of convergence.<sup>17</sup> China has also launched the Metaverse Industry Committee, under the China Mobile and Communications Association (CMCA) to strengthen technological innovation and application integration for the industry, organize the training of professionals, and promote new thinking related to the Metaverse.<sup>18</sup>

<sup>16</sup>VARA, 2022

<sup>17</sup>Coin Telegraph, 2022

<sup>18</sup>Global Time, 2021



4. **Infrastructure:** Given that the necessary infrastructure does not currently exist, efforts to build it will be critical to the development of the metaverse. For the Metaverse to achieve anything close to the potential that its advocates promise, it is possible that every kind of chip will have to be more powerful than it is today – and by an order of magnitude. A localized high-bandwidth, low-latency infrastructure is needed, requiring development in gigabit speeds, millisecond latency, and local and cloud compute. This is mainly an opportunity for the key infrastructure players, and many are already investing either by themselves or with partners. However, governments have a key role to play in encouraging the required development and investment, through tools such as tax breaks, subsidies, and encouragement of collaboration.

## 5. Metaverse Adoption: The Case For Government Intervention

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Charting the course for Metaverse governance does not just involve careful handling of multiple priorities, it also requires stakeholders to strike the right balance between ownership, responsibility, and empowerment. For most democratic states, making Metaverse adoption mandatory is inconceivable; it would constitute an unacceptable infringement of personal freedom and would be a wholly inappropriate role for government. However, there is a case to be made for government intervention to encourage adoption and guide development as the Metaverse continues to evolve.

For example, as highlighted earlier in the lessons from history, government involvement could be particularly effective in balancing regulation with competition by treating the Metaverse and connectivity more broadly as services – much like water or power. This could potentially boost participation, expand the use cases, and grow the Metaverse ecosystem across the board.



The case for increased government involvement starts with a premise; that when more individuals enter the Metaverse, the pool of real time data increases and the entire ecosystem works better. Take the case of traffic: If all individuals driving cars are connected through the Metaverse, the exact number of cars on the road can be easily tracked and traffic can be well managed. By contrast, even if one person on the road is not connected, traffic monitoring might not be possible, and the risk of accident could increase.

As with all tech-driven services, data privacy has long been a hotly debated topic and a source of controversy. However, in today's world, there is a growing understanding among citizens that access to enhanced services and to the products and experiences they desire, involves a privacy tradeoff – and it is one they are generally willing to make. In short, there is collective consensus across government, business, and society that sharing data ultimately drives progress.

Other benefits of attracting more individuals to the Metaverse include:



**Virtual Future Options:** Users in the Metaverse would get an opportunity to view the future options of certain actions and decisions. This would help reduce the errors in decision-making and predicting outcomes



**Improved Accessibility For Services And Products:** More users in the Metaverse would result in greater development of services and products and enhance access to them, resulting in a win-win for businesses and users alike



**Eliminate Intermediate Layers:** The Metaverse/Web3 almost eliminates the intermediate layer of an aggregator/platform and/or payment platform where significant value is lost, allowing creators to interact directly with consumers



**High Reliance And Predictability Of AI Outcomes:** More users engaging on the platform would lead to better predictability of outcomes and less uncertainty, as users would act as real-time data points



**Relieve Administrative Burden On Government:** Digitalization of all processes on the metaverse would help governments manage the administrative burden when everything has gone digital and also cut related costs as a result



**Support Business Growth:** Increased participation in the Metaverse would provide businesses with valuable user data that would help them innovate and develop new product/services



**Offer Enhanced Service To Users:** Citizens and users would be able to access seamless and customized services in real time, removing the need for in-person queuing, physical documents, and tedious everyday chores. The Metaverse also promises to enhance the retail experience and reduce wastage

Unlocking these potential benefits requires deliberate action from government that goes beyond facilitation of the Metaverse, to include incentives, frameworks, and tangible support to businesses and users alike.

Overall, progress on Metaverse development and adoption will be determined by the combined actions of many players and interests across the globe, including technology developers and vendors, investors, industry end-users, governments and, not least, individual consumers. Against this backdrop, governments need to carefully consider their role in this complex ecosystem, focusing on where they can leverage the greatest impact for the benefit of their citizens. In all of this, they need to tread carefully, balancing the need for robust, safe governance with the vital importance of maintaining flexibility, innovation, and individual freedoms.

# About Arthur D. Little





Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations. Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. ADL is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations. For further information please visit [www.adlittle.com](http://www.adlittle.com) or [www.adl.com](http://www.adl.com).



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- 16 <https://www.unlock-bc.com/86027-middle-east-crypto-value-received-to-rise-above-7-percent-in-2022/>
- 17 <https://cointelegraph.com/news/south-korea-to-invest-187m-in-national-metaverse>
- 18 <https://www.globaltimes.cn/page/202111/1238811.shtml>

# Endnotes

- 2 Arthur D. Little experts believe that the Metaverse has the potential to become the Internet of the future
- 13 Web3 is the umbrella term for the next generation of the internet underpinned by decentralization and token-based economics



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