

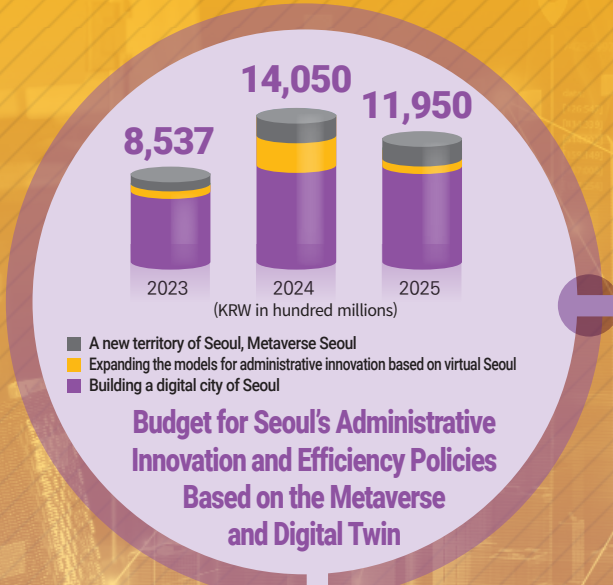
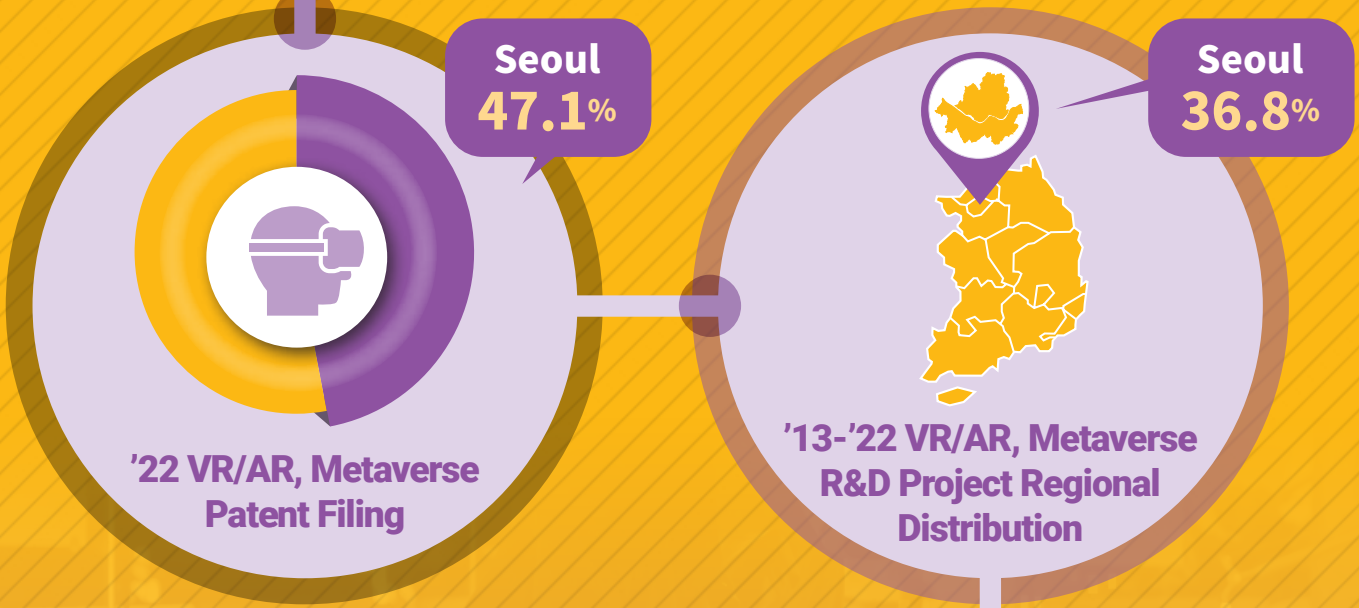
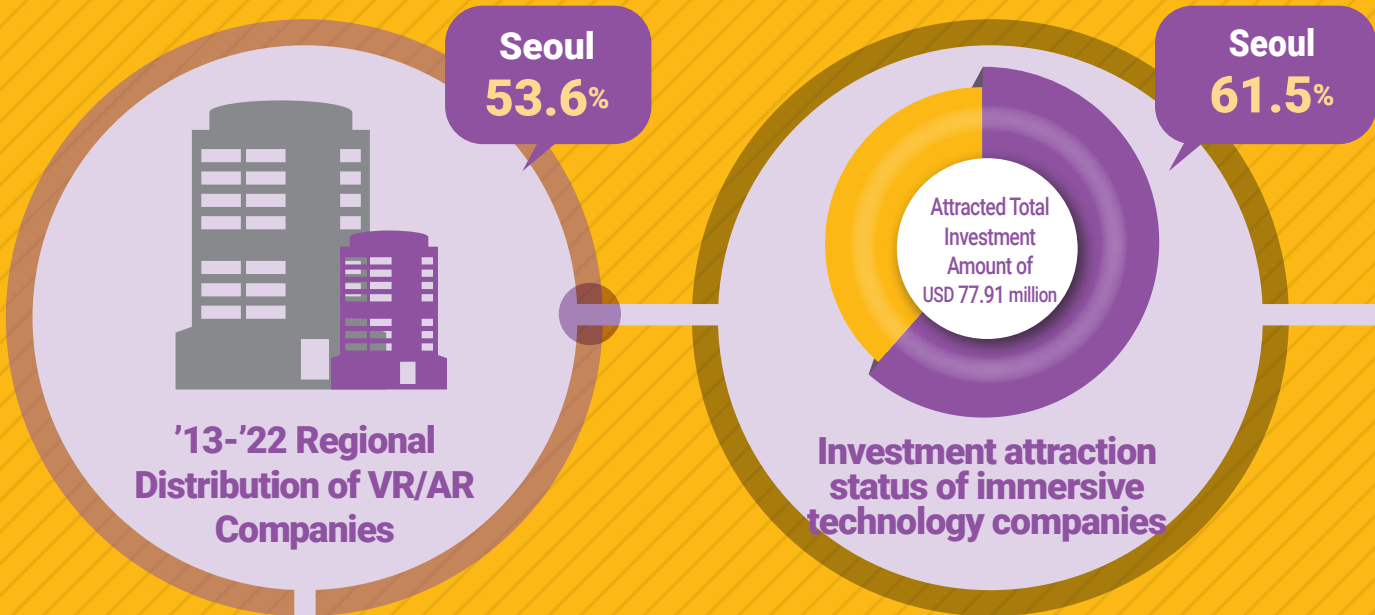


Seoul begins
Metaverse navigation
beyond
**Virtual and
Augmented Reality**

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I. Seoul's Immersive Industry at a Glance



II.

Seoul, the Melting Pot of Virtual and Real Worlds

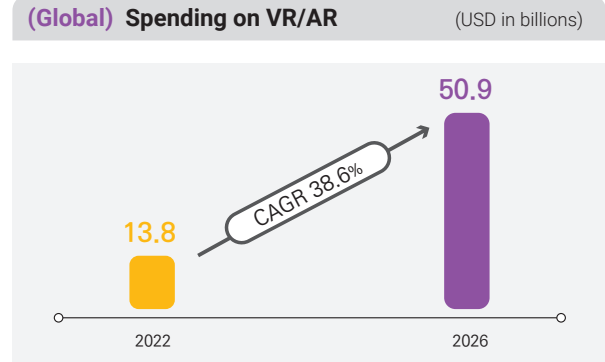
1. Status of the domestic immersive¹⁾ technology industry

The global market for virtual and augmented reality is expected to experience rapid growth. According to IDC, the global spending on virtual and augmented reality is projected to grow at an annual rate of 38.6%, reaching USD 50.9 billion by 2026 from USD 13.8 billion in 2022. Frost & Sullivan predicts that the virtual, augmented, and mixed reality market will grow at an average annual rate of 40.9%, expanding from USD 14.55 billion in 2021 to USD 160.14 billion by 2028.

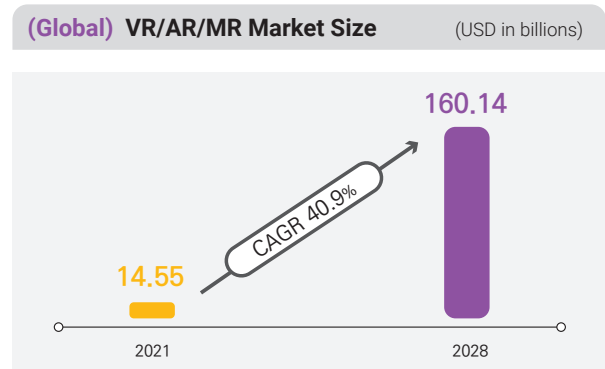
Core technologies such as critical engines, tracking sensors, displays, networks, large-scale data processing, and user interfaces are developing rapidly and spreading across various industries that include content (gaming, entertainment, media, etc.), culture, arts, education, distribution (wholesale, retail, etc.), health care, manufacturing, public service, defense, and aerospace. Gartner anticipates that by 2026, 25% of the global population will spend at least one hour per day in the metaverse for work, shopping, education, and social entertainment, and that 30% of organizations worldwide will prepare goods and services for the metaverse.²⁾

The immersive technology industry is evolving at a rapid pace in South Korea. The virtual and augmented reality industry in South Korea is predicted to expand quickly from KRW 1.2295 trillion in 2021 to KRW 2.0669 trillion by 2025. The metaverse is emerging as an important industry, with a potential economic impact³⁾ estimated

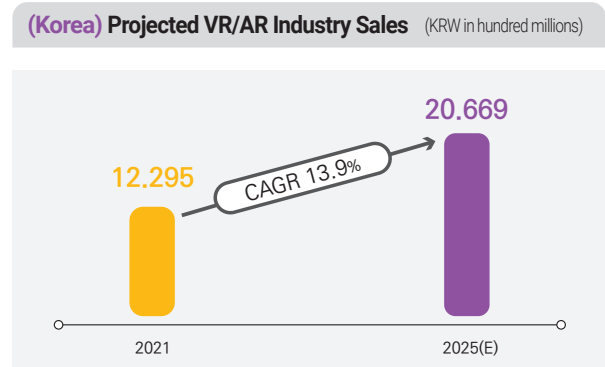
to reach a maximum of USD 67 billion by 2035.



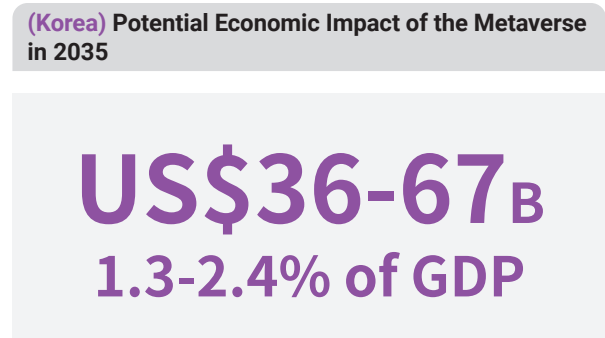
Source: IDC (Nov. 2022)



Source: Frost & Sullivan (Jul. 2022)



Source: The Ministry of Science and ICT, the National IT Industry Promotion Agency (2023)



Source: Deloitte (2023)

1) It indicates virtual reality (VR), augmented reality (AR), mixed reality (MR), and metaverse
 2) <https://www.gartner.com/en/newsroom/press-releases/2022-02-07-gartner-predicts-25-percent-of-people-will-spend-at-least-one-hour-per-day-in-the-metaverse-by-2026>
 3) Deloitte (2023), 「The Metaverse in Asia Strategies for Accelerating Economic Impact」

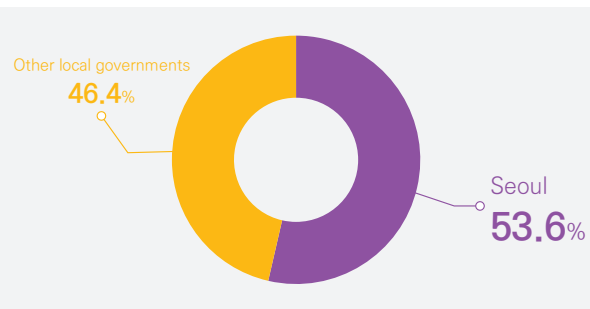
In an effort to adapt to the development and evolution of the immersive technology industry, South Korea announced the “Virtual Convergence Economy Development Strategy” in 2020 that includes: ▲ increasing the use of extended reality (XR) across the entire economy and society ▲ expanding leading XR infrastructure and establishing relevant regulations ▲ supporting XR companies to achieve global competitiveness. The country also introduced the “Second Cultural Promotion Plan” in 2023 and launched the “Immersive Content Promotion Committee.” In addition, South Korea is advancing the legislation of the Virtual Convergence Industry Promotion Bill (Metaverse Industry Promotion Bill, Bill on the Development and Support of the Virtual Convergence Economy) to designate it as a basic law through which the Metaverse industry thrives, and is actively achieving regulatory Improvement by announcing plans for proactive regulatory innovation designed to vitalize the Metaverse ecosystem.

2. Seoul, the center of the Korean immersive technology industry

With the businesses, sales, R&D of the Korean immersive technology industry concentrated in Seoul, the city is driving the growth and technological advancement. Of the 711 VR/AR companies nationwide, 53.6% or 381 are based in Seoul. These companies in the capital city take up 76.9% or KRW 945.3 billion of the entire VR/AR industry sales of KRW 1.2295 trillion in 2021.

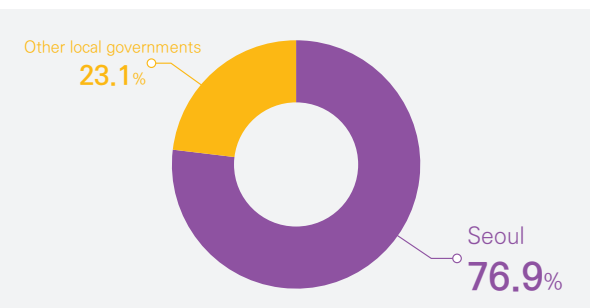
Meanwhile, Seoul is exerting significant influence in the research and development (R&D) sector of the immersive technology industry. Over the decade from 2013 to 2022, Seoul-based companies⁴⁾

Regional Distribution of VR/AR Companies



Source: The Ministry of Science and ICT, the National IT Industry Promotion Agency (n=711)

Regional Distribution of VR/AR Companies Sales



Source: The Ministry of Science and ICT, the National IT Industry Promotion Agency (Based on the sales of KRW 1.2295 trillion in 2021)

took on 1,339 out of a total of 3,636 national R&D projects in immersive technology⁵⁾, accounting for 36.8%. During the same period, out of the total research funding of KRW 1.592 trillion, 37.9%, or KRW 603.8 billion, was executed in Seoul. Furthermore, immersive technology companies in Seoul are taking the lead in related patents. Out of a total of 5,450 immersive technology patents⁶⁾ filed from 2013 to 2022, 1,868, or 34.3%, were filed in Seoul⁷⁾ (based on the location of filing).

4) Based on the primary location in which the funding was spent

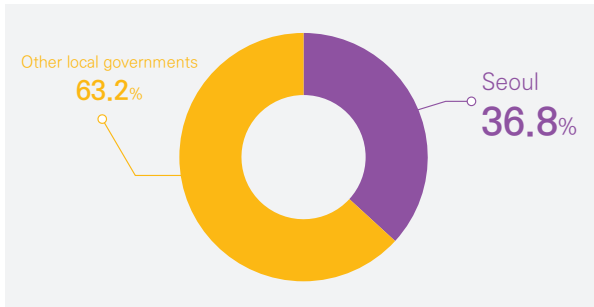
5) The National Science & Technology Knowledge Information Service (www.ntis.go.kr). Projects that contain 'VR, AR, and Metaverse' in their titles

6) Based on patent that contain 'VR, AR, and Metaverse' in their titles

7) Based on the location of the patent applicant

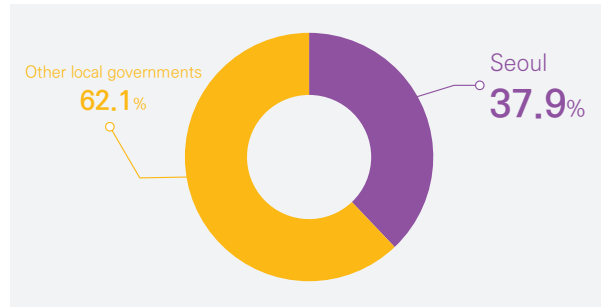
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Distribution of R&D projects on VR/AR/Metaverse



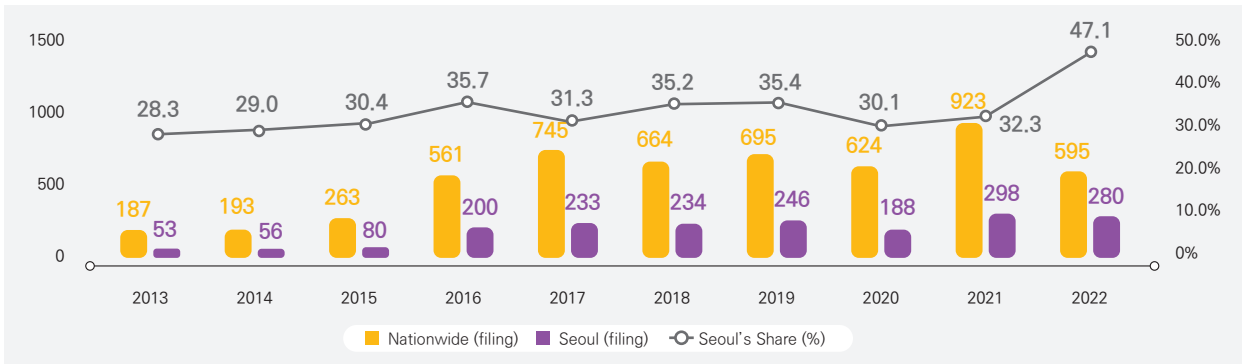
(Based on the amount of funding spent on the projects carried out by companies from 2013 to 2022)
Source: The National Science & Technology Knowledge Information Service (n=3,636)

Distribution of funds for national R&D projects on VR/AR/Metaverse



(Based on the number of projects carried out by companies from 2013 to 2022)
Source: The National Science & Technology Knowledge Information Service (The total research funding of KRW 1.592 trillion)

VR/AR and Metaverse Patent Filing Trend (Nationwide vs. Seoul)



Source: The Korea Intellectual Property Information Search (KIPRIS) (www.kipris.or.kr)

Meanwhile, Seoul is a center of the content industry, which is considered to make most of immersive technology. As of 2021, out of a total of 108,331 content companies in South Korea, 35,331, or 32.5%, are located in Seoul, and Seoul-based content companies contribute significantly to the overall revenue of the Korean content industry, accounting for 62.4% of the total sales of KRW 137.4232 billion, totaling KRW 85.7795 billion.

3. A new territory of Seoul, Metaverse Seoul

In October 2021, Seoul drew up the basic plan for a New Territory of Seoul 'Metaverse Seoul,' and developed a platform for 'Metaverse Seoul' to generate new public services. 'Metaverse Seoul' is the first

mobile app-based Metaverse platform established in the public sector, aiming to introduce the concept of Metaverse in city governance. It is a virtual space in which new public services are created just for Seoul. The city is working on 20 detailed tasks in 7 areas that include: tasks in 7 areas that include: economy, education, culture & tourism, communication, urban, administration, and infrastructure.

At the same time, Seoul is actively embracing new technologies such as digital twin, XR, etc. in city governance to innovate administrative tasks and improve efficiency. By doing so, Seoul is building models for improving urban environment, supporting decision-making, and finding solutions for various urban issues, and implementing intelligent city management. The city is also dedicated to providing better administrative services.

Seoul's Budget for Administrative Innovation and Efficiency Policies Based on the Metaverse and Digital Twin
(unit: KRW in hundred millions)

Policy	2021	2022	2023	2024	2025	Total
A new territory of Seoul, Metaverse Seoul	-	3,900	6,870	9,450	9,280.	29,500
Expanding the models for administrative innovation based on virtual Seoul (S-Map)	1,791	2,617	667	2,600	670	8,345
Building a digital city of Seoul	100	500	1,000	2,000	2,000	5,600
Total	1,891	7,017	8,537	14,050	11,950	43,445

Source: Seoul, Smart Portal Seoul

Creating a new territory of Seoul, Metaverse Seoul

(Economy) Postering the Industry Ecosystem	(Education) Metaverse Learning Support	(Culture/Tourism) Contactless Cultural Marketing
<ul style="list-style-type: none"> Invest Seoul Seoul Fintech Lab Digital Content Playground Metaverse Campus Town 	<ul style="list-style-type: none"> Seoul Learn Metaclass Seoul Learn Dream Center Metaverse Campus of Seoul Citizen College 	<ul style="list-style-type: none"> Metaverse Seoul tour Participatory Festival Platform Metaverse Exhibition Service
(Communication) Customized Open Communication	(City) XR-based Urban Innovation	(Administration) New Concept of Virtual Administration
<ul style="list-style-type: none"> Metaverse 120 Call Center Metaverse Seoul Citizen Platform Virtual Mayor's Office 	<ul style="list-style-type: none"> XR City Intelligent City Management 	<ul style="list-style-type: none"> Metaverse Integrated Conference Service Metaverse Smart Work Metaverse Big Data Service
Metaverse Promotion Infrastructure Metaverse Seoul Platform Metaverse Guideline Establishment		

Source: The Vision and Tasks of the Basic Plan for Metaverse Seoul

III.

Trend of the Immersive Technology Industry in Seoul

1. Content Area

1) Entertainment (music)

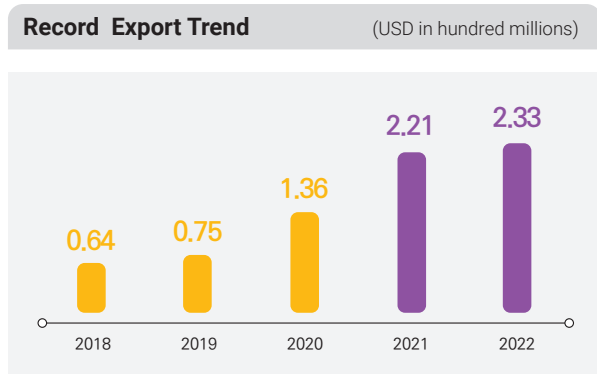
The entertainment-related music industry experts significant influence in the Korean content industry. The popularity and growth of K-pop continue to grow

in not only the domestic but also global music industry, and idol groups such as BTS, NewJeans, and Black Pink are increasingly ranked in the Billboard top chart. Export sales of K-pop albums are experiencing rapid growth, increasing from USD 64 million in 2018 to USD 230 million in 2022.

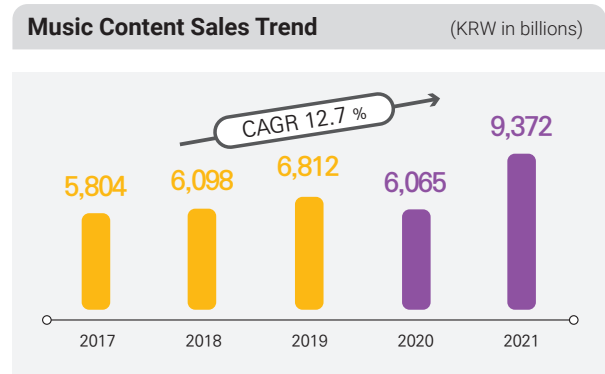
As of 2021, music content companies constitute over 30% of the total content companies in South Korea⁸⁾, and the sales of the music content industry are increasing fast by on average over 10% annually. Seoul-based companies are playing a crucial role in the music content industry. Although music content companies in Seoul make up 23.7% of the total, their revenues take up a staggering 70.0%, demonstrating a considerable influence.

8) Of a total of 108,612 content companies, music content companies make up 34,001, or 31.3%.

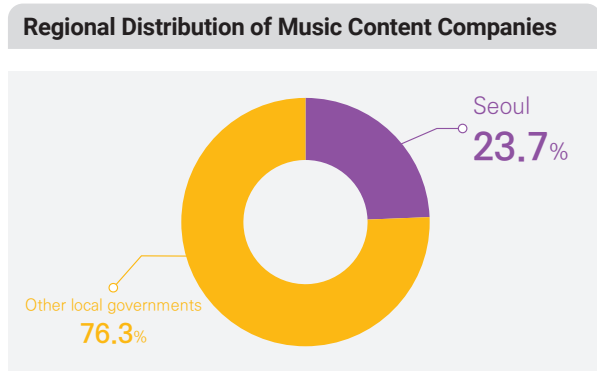
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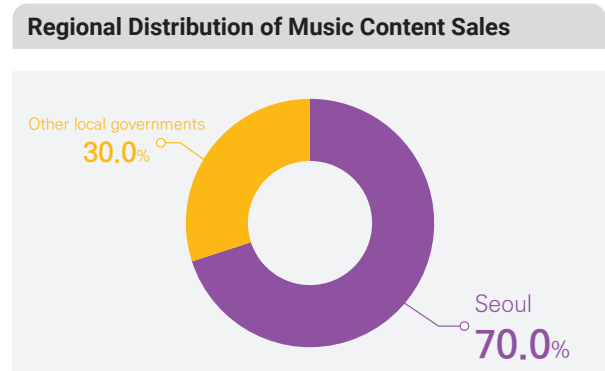
Source: The Korea Customs Service (2023)



Source: The Ministry of Culture, Sports, and Tourism (2023)



Source: The Ministry of Culture, Sports, and Tourism (2023)
Based on 34,001 music content companies



Source: The Ministry of Culture, Sports, and Tourism (2023)
Based on the music content sales of KRW 9.3717 trillion

The Korean music industry is led by major entertainment companies such as **Hybe Corporation**, **SM Entertainment**, **JYP Entertainment**, **YG Entertainment**, etc., which are maximizing sales through not only the primary IP business such as albums, digital music, concerts, and artist management, etc., but also the secondary IP business such as merchandise (MD or goods), fan clubs, etc. In particular, fan clubs play a significant role in enhancing loyalty as fans share preferences, communicate within the community, and strengthen their sense of belonging, and also contribute to expanding the outside base. To that end, major entertainment companies are also entering the Metaverse which is centered around immersive technology.

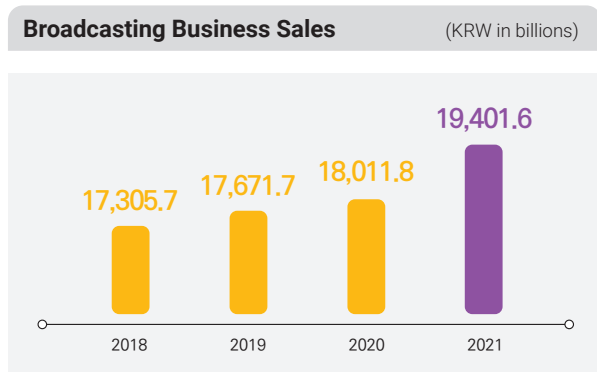
Hybe Corporation is developing NFT tokens using artist IP, merging with its subsidiary Superb to build a Metaverse platform, and launching the IM (Interactive Media) arm, thereby strengthening its capabilities

in the Metaverse business. **SM Entertainment** is focusing on building the SMCU (SM Culture Universe), a future entertainment world combining advanced technologies such as Metaverse, blockchain, and artificial intelligence, etc. **JYP Entertainment** is expanding its investments in Metaverse-related technologies and platforms (Zepeto, Dear U, 4by4, etc.), and prioritizing the establishment of a Metaverse worldview centered around artists.

The combination of the music content industry and the Metaverse holds significant importance as it helps pass the limit of music streaming and artist-centered IP opens up possibilities to expand business in relation to lifestyle based on artist worldviews, trade of various derivatives (artist virtual goods) via NFT, and providing users with experience that allows them to enjoy the pleasure in virtual space linked to real-world activities.

2) Broadcasting/Media

The revenue of the Korean broadcasting industry stood at KRW 19.4016 trillion in 2021, up 7.7% compared to 2020. It is estimated that the industry has rebounded, moving past the impact of the Covid-19 pandemic given: the growth in the OTT⁹⁾ sector has led to an annual average increase of 3.0% in pay-TV subscribers; and the sales of TV advertisement jumped by 16.0% in 2021. Seoul plays a crucial role in the broadcasting industry. **The city houses 60.0%, 231 TV service providers out of the total of 385, and employs 77.5%, 28,359 TV industry personnel out of the total of 36,592.** Seoul is a focal point for major terrestrial TV, general programming cable TV, satellite TV, IPTV, and home shopping companies, excluding local TV providers.



Source: The ministry of Science and ICT, the Korea Communications Commission (Dec. 2022)

Pay-TV Subscriber Trend (in thousands)

Category	2018	2019	2020	2021
Subscriber Number	32,779.1	33,814.6	34,785.2	35,773.5

Broadcasting Advertisement Sales (KRW in billions)

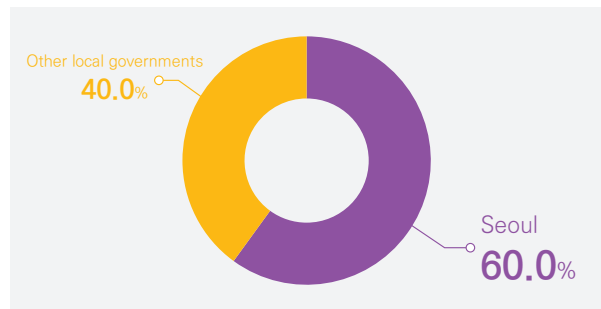
Category	2019	2020	2021
Sales	3,000.9	2,717.2	3,151.2

Source: The ministry of Science and ICT, the Korea Communications Commission (Dec. 2022)

In the broadcasting industry, immersive technology is already widely used in virtual studios, dramas, sports broadcasts, etc. In particular, such technology is increasingly adopted and utilized in creating immersive

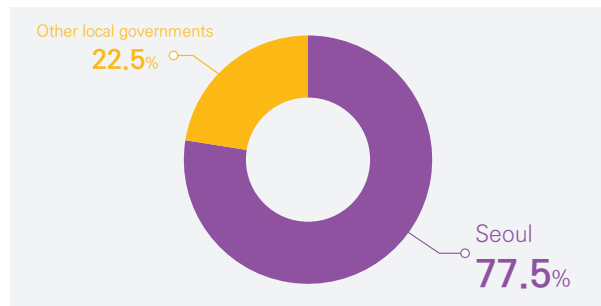
9) OTT (Over the Top): It is VOD (Video on Demand) services that provide broadcasting content to users at their convenience through various platforms over the Internet

Regional Distribution of TV Service Providers



Source: The ministry of Science and ICT, the Korea Communications Commission (Dec. 2022) Based on 385 TV providers

Regional Distribution of TV Industry Personnel



Source: The ministry of Science and ICT, the Korea Communications Commission (Dec. 2022) Based on 36,592 TV Industry Personnel

platforms, avatar, and digital human-based TV content and converting NFT-related broadcasting IP into digital assets, promoting digital advertisement and events, etc. In other words, immersive technology is expanding its influence beyond basic content creation and platform development to affect the overall broadcasting industry including the secondary economy, broadcasting identity, marketing, intellectual property, etc. The growing adoption of immersive technology in the industry is driven by the increasing demand for immersive TV and media content, facilitated by advancements in high-definition, high-quality broadcasting, and media devices.

In response, major broadcasting and media companies are also actively introducing immersive technology. Indeed, **the Korean Broadcasting System (KBS)** opened 'Let's Go KBS World' in Zepeto, provided services such as a broadcast studio and sets for the 2022 presidential election vote results, and aired the 'Virtual Top 10 Songs' in the Quantum Oasis (virtual space) led by the singer Alexa (virtual human).

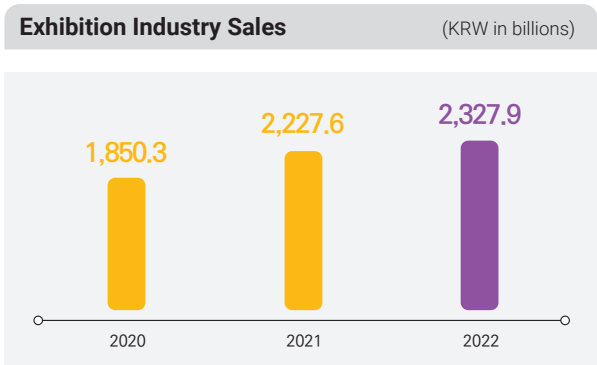
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The **Munhwa Broadcasting Corporation (MBC)** utilized the Metaverse for entertainment programs such as 'The Masked Talent,' 'Estimation King,' etc., and opened spaces such as the MBC office building, Newsdesk, etc. on the Metaverse platform 'The Sandbox,' providing services like Newsdesk, Content Gallery, games, etc. **SBS Contents Hub**, a subsidiary of Seoul Broadcasting System (SBS), collaborates with the Metaverse platform 'The Sandbox' to create 'Running Man Theme Park' in which users can experience various game missions from the 'Running Man' program. **CJ ENM** has also strengthened its Metaverse business by applying for the trademark 'Enter Verse,' investing in the U.S. Metaverse company 'Hyperreal,' and entering into a Metaverse broadcasting partnership with 'The Sandbox.'

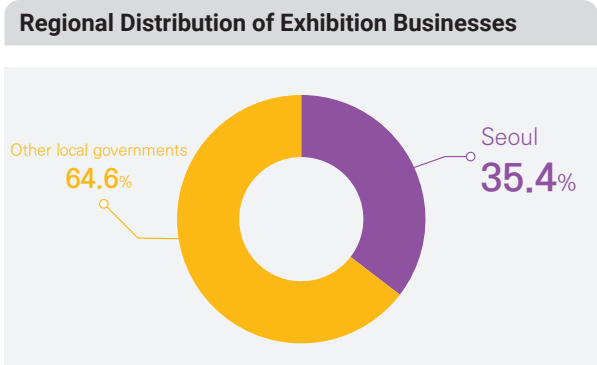
2. Culture and Arts (exhibition) Area

The exhibition industry in South Korea faced an unprecedented crisis driven by the COVID-19 pandemic, but it is gradually showing signs of recovery by one estimate. Although the revenue of the exhibition industry stood at KRW 1.8503 trillion in 2020, down by over 50% compared to the previous year, it steadily increased since then, reaching a staggering KRW 2.3279 trillion in 2022.

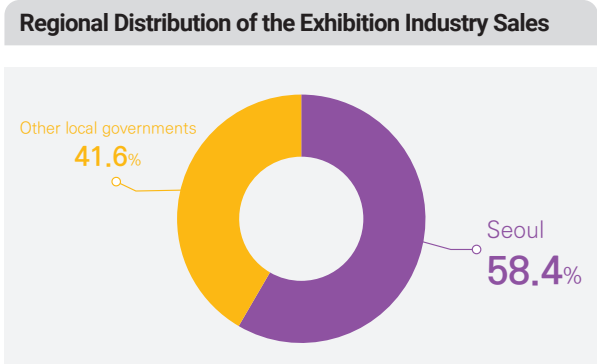
Seoul is home to some of Korea's representative museums (the National Museum of Korea, the Seoul Museum of History), art museums and galleries (the National Museum of Modern and Contemporary Art, the Seoul Museum of Art), and large exhibition halls (COEX, SETEC), holding significant influence in the exhibition industry. **The city houses 35.4% of Korean exhibition businesses, hires 48.6% of exhibition industry personnel, and generates 58.4% of the exhibition industry revenue.**



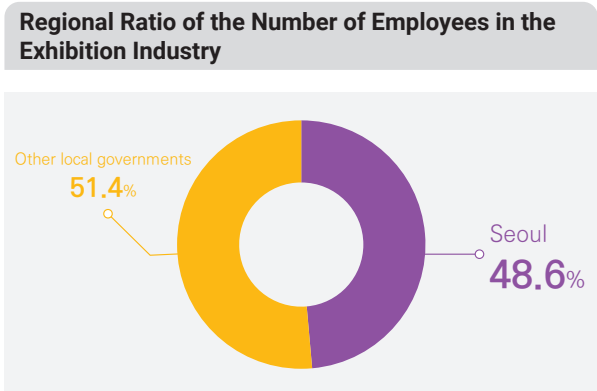
Source: The Korea Invention Promotion Association



Source: The Korea Invention Promotion Association (Oct. 2023)
Based on 2,456 exhibition businesses in 2022



Source: The Korea Invention Promotion Association (Oct. 2023)
Based on the sales of KRW 2.3279 trillion in 2022



Source: The Korea Invention Promotion Association (Oct. 2023)
Based on 10,753 personnel members in 2022

The convergence of culture and art exhibitions with immersive technology is significantly vitalized in the art market. The global art market itself has formed a huge industry worth USD 67.8 billion¹⁰⁾ in 2022 and the domestic market is also experiencing growth, surpassing KRW 1 trillion¹¹⁾ in 2022. The art market has lately seen substantial growth as the transaction of NFT-based digital art and collectibles increased, which are closely associated with the Metaverse. The growth of the NFT digital art market has been fueled by the MZ generation eager to get their hands on limited editions (something scarce), and by the growing number of investors turning to NFT digital art instead of traditional artworks.

Immersive technology is evolving to an expanded technology, providing economic platforms for trading artworks and collectibles in digital virtual spaces, breaking away from the digital virtual space platform just for art exhibitions. According to NonFungible.com, the sales of NFT artworks and collectibles, which were only USD 4.6 million in 2019, skyrocketed to USD 11.1 billion in 2021¹²⁾, demonstrating the substantial impact of immersive technology, especially the Metaverse, on the art market.

The National Assembly in Korea is also recognizing the importance of immersive technology in the culture and art sector, and the potential of which as an enabler for development and innovation, and planning to amend the 'Act on The Development of Exhibition Industry' to include online exhibitions held in three-dimensional virtual spaces within the category of cyber exhibitions. This move is expected to further advance immersive technology (Metaverse) in the culture and art sector.

3. Education Area

Driven by a high degree of enthusiasm for education and investment, the Korean education industry has developed centering around on- and off-line private educational institutions, home learning materials, and electronic learning. The industry has steadily grown due to factors such as remote learning (the Covid-19 pandemic), increased educational expenses per child (concentrating on educating one child), and the growth of the adult lifelong education market (rise in the aging population). Recently, the industry has transitioned into Edutech¹³⁾ based on new digital technologies including immersive technology, artificial intelligence, cloud robotics, blockchain, etc.

Immersive technology plays an important role in the Edutech industry. It is highly valued for its educational effectiveness as it provides students with a creative, interesting, and enjoyable learning experience. Students can effectively experience a variety of learning activities in virtual space that are not easy to encounter in hands-on learning, such as science experiments, astronomy observations, space exploration, and experiences related to history, culture, and art. Furthermore, through interactions (feedback) with other participants in the learning, students can enhance their social and communication skills.

Meanwhile, educators (teachers, instructors) actively incorporate immersive technology-based learning environments into their classrooms. They recognize the learning benefits that immersive technology brings to students, such as interesting elements it provides, fulfillment of students' identity expression through avatars, positive participation, and engagement of students through interaction, and the ability to address problems that cannot be solved in the real world. Thus, it is predicted that the demand for immersive technology in the education industry will soar.¹⁴⁾

10) The Art Basel&UBS (2023), 「THE SURVEY OF GLOBAL COLLECTING 2023」

11) The Ministry of Culture, Sports, and Tourism (Jan. 4, 2023). "The Korean art market sales surpassing KRW 1 trillion"

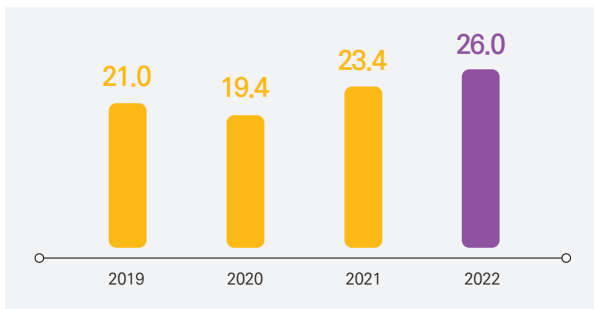
12) The Art Basel&UBS (2022), 「The Art Market 2022」

13) Edutech is a compound word of education and technology used in Korea and is commonly referred to as Edtech or Education Technology, globally

14) HolonIQ (Jan. 2021) 「Global Education Technology in 10 Charts」 said that the global expenditure on VR and AR in the education industry is projected to increase by 600% over 7 years, from USD 1.8 billion in 2018 to USD 12.6 billion in 2025.

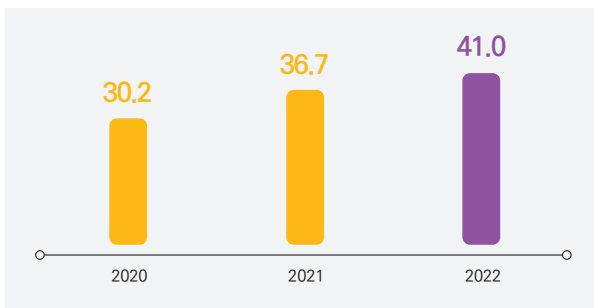
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Private Education Expenditure Trend (KRW in trillions)



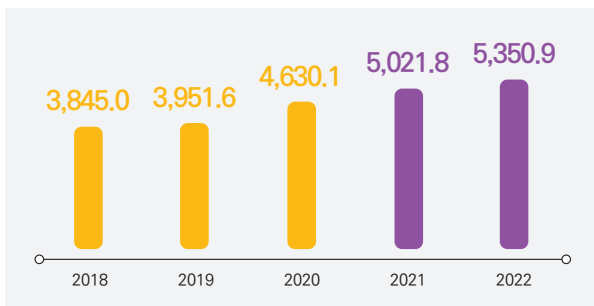
Source: Statistics Korea

Monthly Average Private Education Expenditure Trend per Student (KRW in tens of thousands)



Source: Statistics Korea

Electronic Learning Industry Sales Trend (KRW in billions)



Source: Trade, Industry and Energy, the National IT Industry Promotion Agency (each year)

Individual e-Learning Usage Rate

Category	Seoul	National Average
Usage Rate	65.1%	60.8%

Source: The Ministry of Trade, Industry and Energy, the National IT Industry Promotion Agency (2023)

Research and Markets, a global market analysis company, predicts that the global education Metaverse market will grow at an annual average rate of 37.7% from USD 3.9 billion in 2023 to USD 19.3 billion in 2028.¹⁵⁾ Metaverse education is considered the most feasible field in education as it has no geographical limit and allows interactive and immersive learning. South Korea is expected to experience faster progress and growth in the adoption of the Metaverse compared to other fields given its strong enthusiasm for educational investment, which leads to robust demand for the virtual education, and its well-established infrastructure for e-learning (online education), especially in the private education market.

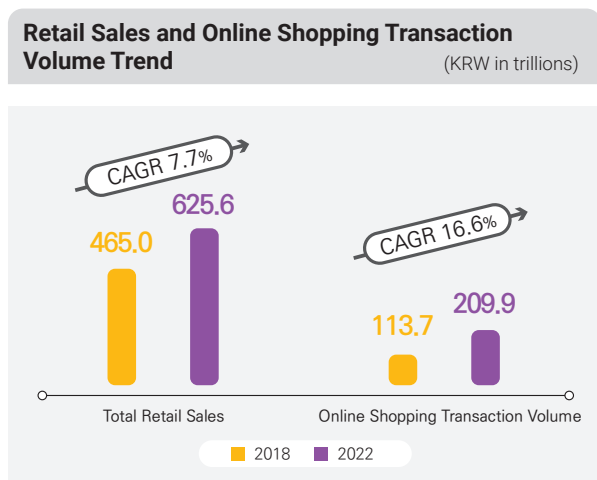
Already, companies representing the education service of South Korea are taking the lead in introducing and developing immersive technology and services. **Kyowon (Red Pen)** launched the Metaverse home learning materials 'AiCANDO' for elementary students and 'AiCANDO Nuri Kids' for preschoolers. The company has implemented a virtual classroom platform and applied multi-modal (learner's facial expressions, voices, learning behaviors, etc.) analysis, providing highly personalized learning tailored to each individual through micro-learning content like 3D animations, 360° videos, and creator videos. **Daekyo** has opened the Metaverse learning platform 'Summit World' on Gather Town, offering services such as a Daekyo Summit public affairs office (math learning experience), Eye-Level Learning Center Zone, OX quizzes, etc. **Chunjae Education** has launched the 'ZEP Metaverse Classroom,' providing learning content including videos, quiz games, etc. across 28 learning fields such as elementary math, society, science etc.



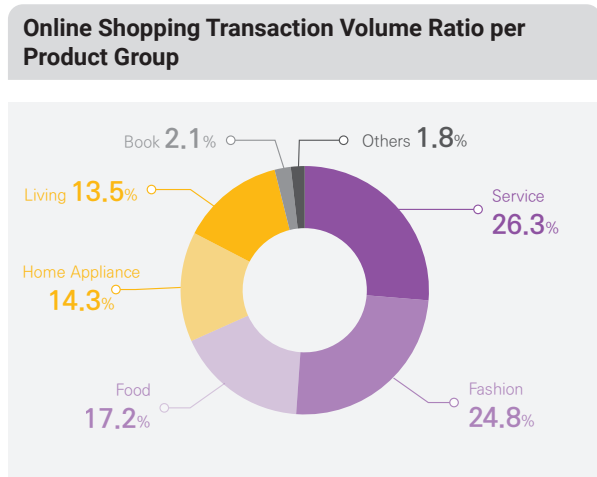
¹⁵⁾ https://www.researchandmarkets.com/report/metaverse-in-education?gad_source=1

4. Distribution (fashion/beauty) Area

The growth of Korea's distribution industry is significantly driven by the online (mobile) shopping sector. From 2018 to 2022, the total retail sales transaction volume increased by an average of 7.7% annually while the online shopping transaction volume climbed by an annual average of 16.6%, more than twice than the retail sector. The growth of the online sector has been led primarily by the service area¹⁶⁾, constituting 26.3% of the 2022 transaction volume, and the fashion area¹⁷⁾, accounting for 24.8%.



Source: Statistics Korea (each year)



Source: Statistics Korea (Feb. 2023) Based on the 2022 online shopping transaction volume

In the fashion (beauty) sector, immersive technology provides consumers with opportunities to virtually try on clothes (fulfilling the desire for experience) before ordering; to express their personality through avatars (fulfilling the desire for self-expression); to purchase physical products through NFTs (fulfilling the desire for convenience), etc. As a result, the technology has become an effective marketing tool.

It also provides fashion companies with new marketing channels that transcend space and time constraints, offering opportunities to enhance consumer accessibility (exposure to new products) and brand awareness (brand promotion), and helps reduce heavy marketing costs by integrating with AI-based customer analysis. Additionally, immersive technology is expected to monitor consumer responses swiftly, contributing to addressing persistent challenges in the fashion (beauty) industry, such as bad inventory and returns management.

As immersive technology offers various advantages and effects, major distribution companies (Lotte, Shinsegae, Amorepacific), home shopping companies (Lotte Home Shopping, NS Home Shopping), and professional fashion (beauty) brand companies (F&F, Fila, Kolon FNC) are actively adopting and utilizing the technology in their businesses. It is projected that the adoption and utilization of immersive technology will spread across the entire distribution industry.

5. The reason you should focus on the immersive technology industry in Seoul

Seoul-based companies are actively participating in immersive technology supply, joint business exploration, technological investments, etc. through the collaboration and partnerships with major companies in industries such as content, culture and arts, education, distribution, etc., and are also actively joining Seoul's investment in immersive technology and various public service projects, aiming to expand their customer base and shore up their businesses.

16) Consisting of services such as travel and transportation, culture and leisure, electronic coupon, food, and others

17) Consisting of clothing, shoes, bags, fashion items and accessories, sports and leisure goods, cosmetics, and children's and baby products

● ● ● **Seoul Begins Metaverse Navigation Beyond Virtual and Augmented Reality**

Moreover, to meet the increasing demand for the adoption and utilization of immersive technology and to secure market competitiveness and influence, companies based in Seoul are focusing on the development and advancement of key platforms and element technologies. The patent applications related to immersive technology by Seoul-based companies have shown outstanding competitiveness, with an average annual increase of 20.3% since 2013, surpassing other regions (the average annual increase of 10.0%).

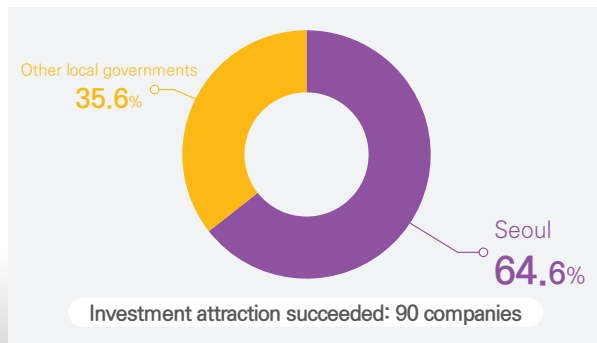
Furthermore, the convergence of K-content and immersive technology is anticipated to bring about unprecedented innovation in content types, giving new user experiences as Korean entertainment companies expand their global influence based on world-captivating K-content and robust fandom culture, and as Seoul-based companies continue to enter foreign markets through major domestic Metaverse platforms¹⁸⁾. Meanwhile, Seoul-based immersive technology companies are taking the lead in building a Metaverse ecosystem environment,

spearheading the 'Metaverse Alliance'¹⁹⁾ formed in 2021.

As such, Seoul-based companies are displaying strong enthusiasm for national research projects and patent activities, outperforming their counterparts in other regions in the immersive technology industry, which is rising as a future critical technology. Investors are showing a keen interest in Seoul-based companies with strong R&D and service capabilities, expanding investment. Some companies (Sconec Entertainment, Stoic Entertainment, etc.) even made a successful IPO.

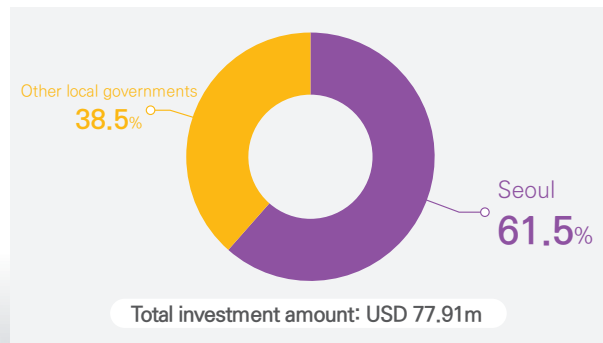
There are 485 Korean immersive technology companies listed on Crunchbase with 225 of them located in Seoul, constituting 46.4%. Among them, a total of 90 companies have attracted investments and Seoul-based companies make up 58 of them, accounting for 64.4% and the total investment secured by Seoul-based companies amounts to USD 479.4 million or 61.5% of the overall investment, far outperforming their counterparts in other regions. These data provide grounds to keep a close eye on Seoul-based immersive technology companies.

Status of Immersive Technology Companies that Attracted Investment



Source: Crunchbase (as of the end of November, 2023)

Status of the Investment Amount that Immersive Technology Companies Attracted (unit: USD 1 million)



Source: Crunchbase (Dec. 2023)

18) As of the end of 2023, Zepeto has cumulated 400 million users, with over 95% being international, and partnered with at least 150 brands in total. Ifland provides services in over 50 countries, including North America, Europe, the Middle East, and Southeast Asia, etc. The Sandbox has surpassed 8 million cumulated users, with over 1.3 million monthly active users

19) 950 companies and institutions joined the alliance to develop Metaverse technology and services and establish an industrial environment for economic vitalization

IV.

Seoul Companies, Aiming to Become a Rising Star

1. Awesomepia

Beyond Real World, Create New Experience & Trip



Through its 'XR Telescope' and 'Metaverse Platform,' Awesomepia is providing intelligent virtual cultural tour solutions with an immersive atmosphere.

A company developing and offering the AI-based XR telescope (BORA) and the Metaverse platform for tourism (MetaLive), aiming to provide cultural tourism services in which real and virtual spaces are combined

Investment Stage	Series A
Number of employees	36 people
Investment Attraction Amount (Accumulated)	KRW 5 billion

Q Please introduce what kind of company Awesomepia is.

As you can tell from its English name, Awesomepia develops and provides amazing cultural tourism services that transcend space and time constraints with its new concept of Metaverse technology and services. Awesomepia integrates the AI-based XR telescope and the Metaverse platform to provide real-time information on popular tourist destinations and virtual convergence services with an immersive atmosphere, contributing to the vitalization of local economies.

Major Products and Services

The XR telescope (BORA) has dramatically improved the shortcomings of the traditional telescopes

installed at tourist destinations. It offers XR shooting, digital tour guides, and video data analysis, setting aside the basic telescope functions. Moreover, the Metaverse platform 'MetaLive' is linked to BORA, providing immersive tourism experiences corresponding to the tourist destination in the virtual space, based on live videos and tourist information.

Awesomepia's Distinctive Advantages

Based on AI and XR technology, Awesomepia enables users to experience immersive videos and tourist content regardless of weather or season. It also offers real-time lifelike tourism experiences in the virtual space as it is linked to the Metaverse platform through the real-time data transmission technology. Moreover, Awesomepia automatically detects, saves, and sends abnormal videos from the recorded footage, making it useful for observing animal movements, predicting natural disasters, etc. It also holds several related patents.

Q What are Awesomepia's plans for business and overseas expansion?

Awesomepia is in particular installed at major tourist destinations where there is a high demand from foreign tourists. Additionally, it is planning to collaborate with municipalities whose goal is to boost the local economy through tourism service improvement, expanding to historical sites or tourist attractions with beautiful natural landscapes. Meanwhile, Awesomepia is planning to target the countries known for tourism such as the United States, Japan, Vietnam, Singapore, Israel, Italy, etc. To this end, Awesomepia is determined to strengthen a partnership with Lotte Corporation to expand its global distribution networks.

Q What are the anticipated effects through investment attraction?

Currently, commercialized products and services are available on site, demonstrating their effectiveness. The primary goal going forward is to provide Awesomepia's products and services at global tourist destinations. In particular, Awesomepia is about to enter foreign markets in earnest, targeting the U.S. and Japanese markets in 2024. Thus, it is expected that investment attraction will contribute greatly to securing and expanding the foundation for overseas expansion.

2. DoubleMe

YouTube in the realm of Mixed Reality



With the provision of an infinite mixed reality space, DoubleMe offers a new entertainment service by which users can also expand the physical space infinitely.

The company that operates Twin World (<http://twin.world>), a Metaverse platform in the real world where users create and share their own mixed reality experiences in the mixed reality space

Investment Stage	Series B
Number of employees	71 people
Investment Attraction Amount (Accumulated)	KRW 30 billion

Q Please introduce what kind of company DoubleMe is.

DoubleMe offers services that create your own mixed reality space, blending reality and virtuality. Partnered with 15 global mobile carriers, DoubleMe improves the public's access to 3D technology, blurs the boundary between real and virtual worlds, and provides a new social experience through an end-to-end platform. DoubleMe aims to allow users to upload content themselves and earn advertising revenue, eventually becoming a Metaverse version of YouTube.

Major Products and Services

TwinWorld is a mixed reality service that applies virtual 3D images to real spaces, overlaying the real world with virtual reality. Utilizing this service, users can create their own mixed reality and share the experience with others. Traditional Metaverse platforms were confined to computers, offering limited immersive experiences to users. TwinWorld, however, introduces a novel approach by which reality and virtuality is blended to create a new space, enhancing immersive experiences of users. This, in turn, extends their time spent in offline spaces, facilitating their buying decisions. Additionally, TwinWorld can be utilized in various

fields such as entertainment, tourism, real estate development, education, and treatment. It is a real-world Metaverse service where users can decorate wherever they wish and share them with others.

DoubleMe's Distinctive Advantages

Although suitable for specific purposes, traditional virtual reality has limitations in scalability as the space itself is entirely computer-generated. However, the services provided by DoubleMe is well-positioned as a new platform for spatial computing, capable of deploying digital content in all real-world spaces, including workplaces, schools etc. Already, DoubleMe has been established as a platform, allowing for easy expansion into various services. Moreover, user generation is remarkably simple, even for those unfamiliar with the logical structure of computers. Its technological advantage is also evident with its 11 patents filed in the United States and 2 patents in Korea.

Q What are DoubleMe's plans for business and overseas expansion?

DoubleMe is planning to develop its own third-party (apps that can be downloaded from general app stores) application and to launch it for domestic mobile users. The company has established a foothold in Spain to target the European market, and has plans to officially enter the U.S. market starting next year. In response to the increasing interest in AR/VR in Middle Eastern countries, DoubleMe is preparing strategies for the market entry.

Q What are the anticipated effects through investment attraction?

It may be too early to compare DoubleMe to other hardware platforms including mobile devices, etc. Still, DoubleMe has gained a strong user base, particularly in terms of headsets and glasses. Moreover, these devices are increasing due to the market entry of big tech companies, indicating that market has huge potential. DoubleMe, as a user-generated MR platform company, is passionate about entering the major economies such as Europe, the United States, the Middle East, etc. putting itself on the map. Thus, DoubleMe is eager to find investors that can strategically lead the company and at the same time, play a role of basic financial investors.

3. Venta VR

Real Beyond Real

Venta VR is an immersive content studio based on 3D VR technology, creating content more lifelike than reality itself.



The global leading comprehensive and immersive content production studio with over 2,000 commercialization experiences

Investment Stage	Series B
Number of employees	33 people
Investment Attraction Amount (Accumulated)	KRW 5 billion

Q Please introduce what kind of company Venta VR is.

Venta VR is a company specializing in the creation of various content including K-pop and the provision of live streaming services, utilizing the critical technology of S3D VR content based on reality. In particular, Venta VR systematically manages all work processes from planning to the last stage through its in-house system, creating high-quality and high-efficient content. The company offers content in new ways through VR, leading innovation in various fields such as entertainment, education, training, communication, etc.

Major Products and Services

Venta X is a global K-pop VR content application as well as a 3D VR performance platform based on VR devices. The VR Live, an offline concert, provides users with new experiences in which the artist on the stage is displayed in front of the eyes of the users, giving them on-site atmosphere. Additionally, Venta X has the world's largest collection of over 600 VR-exclusive videos. Venta CMS is a solution service that allows simultaneous VR viewing for multiple users, using reality-based S3D content. This convenient solution is highly effective and can be easily introduced anywhere, making it suitable for various applications, including offline VR concerts.

Venta VR's Distinctive Advantages

Venta VR has a deep understanding and production skills in VR videos, building on its unique know-how through the VR content production experiences of more than 2,000 since 2015. Venta VR can constantly create high-quality content through its 3D VR production capabilities that stay ahead of its global competitors. Specifically, using the Venta S3D tool for 8K 3D VR content production, the company can dramatically reduce the post-production time for real-time 3D stabilization and the creation of high-quality and high-resolution 3D VR content. Moreover, Venta VR has developed a unique production solution, which can be viewed for long hours through motion sickness mitigation technology, and can convert 3D videos to real-time VR and then send.

Q What are Venta VR's plans for business and overseas expansion?

Venta VR plans to provide opportunities for experiencing VR performance content centering around K-pop in various countries, and to launch the Venta X platform on new XR devices. In addition, Venta VR is intent on bringing its production solution in the form of a studio package to the global market, elevating Venta X into a global platform where audiences across the world can enjoy performances by global artists.

Q What are the anticipated effects through investment attraction?

Venta VR aspires to become a leading company in producing and distributing the most VR original content worldwide. Venta VR is already staying ahead of the market, having secured and produced the largest amount of content in the K-pop and industrial safety sectors. Considering that the VR market has now taken its first steps, this investment attraction is expected to go a long way toward growing Venta VR as a global VR content service company.

4. Dataloging

Providing Login to the Metaverse, a New World in Digital Earth



Dataloging is building a Web3.0 ecosystem for the MICE sector through Metaverse platform services led by creators.

Dataloging, started as a Metaverse museum platform, has become a Web 3.0 Metaverse company that handles Metaverse online exhibitions, content creation and trading, and revenue generation, expanding into a comprehensive Metaverse vertical ecosystem

Investment Stage	Seed
Number of employees	11 people
Investment Attraction Amount (Accumulated)	KRW 60 million

Q Please introduce what kind of company Dataloging is.

Dataloging offer a Metaverse museum platform and a Metaverse online exhibition platform based on copyright and cloud (SaaS) subscription fees. Moreover, Dataloging provide a creator-driven Hexaworld platform in which content created by creators are freely distributed and traded, establishing a Web 3.0 economic environment and system that works perfectly in the virtual space and satisfies all participants.

Major Products and Services

The 360°VR Museum is a digital heritage service that allows users to experience museum exhibitions in realistic 3D VR anytime anywhere. It is also a Metaverse museum platform with a membership of 800,000 users, offering SaaS-based online exhibition data analysis services to a museum director. The 360Xcon is a solution that can create 'Metaverse virtual exhibitions,' providing a tour-like experience. 360Hexaworld indicates a Metaverse creation platform, allowing users to create and trade their own 3D content in a 3D virtual space.

Dataloging's Distinctive Advantages

The biggest strength is that we hold patents related to Metaverse platforms and the like, which provides development tools and engines that support the entire process from content creation to distribution and revenue generation. Thus, a self-sustaining ecosystem can be driven and established by creators and participants, which, in turn, will give tremendous expansion opportunities to Dataloging and make us stand out from other Metaverse platforms. This is our unique business model. Plus, the company has secured a stable revenue model for the business by which content copyright fees and SaaS-based subscription fees are collected

Q What are Dataloging's plans for business and overseas expansion?

Through its 360°VR Museum business, Dataloging has secured 87 domestic virtual museum (with 240 individual contents) as clients and 800,000 users, making it the company with the biggest share in the domestic Metaverse museum industry in Korea. 360xcon has expanded into the corporate marketing sector, targeting company and institution customers such as Yuhan-Kimberly, Hyundai Construction Equipment, and the Korea atomic industrial forum, etc. 360Hexaworld, launched in 2023, currently offers services for the metaverse Seoul map and concentrates on expanding the creator ecosystem, securing related content, and developing local maps of Busan, Incheon, Jeju-do, etc. Moreover, 360Hexaworld has signed a MoU worth of USD 20 million with Niantic (USA) and Immersal (Finland) for overseas market entry such as the United States and Japan.

Q What are the anticipated effects through investment attraction?

In the Web3.0 Metaverse platform a rich ground of creators and a stable and secure distribution, transaction, and economic support system are crucial. Dataloging anticipates that significant benefits are likely to be driven by forming a necessary foundation for creators (for competition and contest); advancing the virtual economy system; and securing a foundation for foreign market entry (acquiring overseas content and expanding transaction channels).

5. Linkflow

Say Goodbye to Seeing the World Only in Front of Your Eyes, Experience the World With a 360° Video



Our Neckband wearable camera allowing for 360° shooting is providing a new visual experience.

A company dedicated to the Metaverse that delivers truly immersive experiences based on crisp lifelike footage from the world's first 360° neckband wearable camera

Investment Stage	Series B
Number of employees	29 people
Investment Attraction Amount (Accumulated)	KRW 30 billion

Q Please introduce what kind of company Linkflow is.

Linkflow provides various services such as: immersive video creation and synthesis centering around its 360° wearable cameras or bodycam (NEXX360) and personal action cam (FITT); and the Metaverse. It originated as a startup developed by the C-lab, Samsung Electronics' in-house venture program, and its wearable 360° camera was selected as a next-generation world-class product by the Ministry of Trade, Industry and Energy and the Korea Trade-Investment Promotion Agency (KOTRA), proving that the company indeed has superb technology and creativity.

Major Products and Services

The NEXX series includes NEXX360, a 360°4-channel neckband CCTV, and NEXX ONE, a wide-angle 1-channel camera that provides VoIP (Voice over Internet Protocol) functionality. The NEXX series enables not only video and audio recording but also real-time transmitting through network, allowing for real-time communication between the site and the control center of headquarters. As a result, this series is utilized in construction site safety management, building security, police body cameras, etc. The FITT series has FITT360, which stitches footages onto 360° view in real time and saves it in a VR-like format; FITT360 PB, a dash cam for bikes that records the surroundings of a wearer in 360°;

and PB100G, which can censor footages with a mosaic to protect data security and personal information.

Linkflow's Distinctive Advantages

Unlike traditional body cams or action cams, which are criticized for having blind spots, our products can shoot in a 360° to minimize such weakness, record video and audio simultaneously, and be shared real-time from a distance away through network. In addition, our unique stitching technology allows videos recorded in a 360° to be offered as a unified video rather than segmented videos, which is quite different from others. Moreover, the integration with VR HMD enables users to experience the 360° captured and synthesized video in a VR environment. Developed in a neckband form, our products has reduced camera shake compared to traditional body or action cams, which enables the provision of stable video output. Also, our AI-based video processing technology allows for the delivery of high-quality footages.

Q What are Linkflow's plans for business and overseas expansion?

Linkflow's products have been approved for their excellence, offering more than 10,000 units to national and public institutions. They are also being developed to be used for the armored weapon system in the defense sector and to be mounted on infantry combat helmets. Our products are also increasingly adopted in various social safety fields such as smart factories, construction, transportation, healthcare, etc. Thus, Linkflow is making active efforts to expand its customer base and develop technology to meet the demands in the public (defense) and social safety sectors. Additionally, the company has entered the Japanese market for bikes dash cams since 2023 in earnest and is planning to penetrate the U.S. body cam market, targeting law enforcement agencies.

Q What are the anticipated effects through investment attraction?

We expect that, in the short term, investment attraction could accelerate the development of video processing technology tailored to customer needs, and help secure local bases for the U.S. and Japanese market sales expansion and obtain raw materials for export volume. In the long run, Linkflow aspires to present the real world in the Metaverse environment based on actual footages recorded, going beyond the 360° wearable cameras manufacturing and video provision, thereby expanding into a sales and distribution platform. The investment attraction is expected to play a significant role in facilitating this transition into the Metaverse environment.

6. Immersive technology companies, garnering the attention of investors

Name (alphabetical order)	Representative Name	Representative Products and Services	Investment Stage	Website
Gaudio Lab	Oh Hyun-Oh (Henney Oh)	AI-based 3D audio solutions	Series B	https://www.gaudiolab.com/
GALAXY corporation	Choi Yong-Ho	Metaverse AI avatar portal	Series A	https://www.galaxyuniverse.ai/
Dexter Studios	Kim-Wook/ Kang Jong-Ik	Content development and production	Series C	http://www.dexterstudios.com/
DOORIBUN	Seo Kook-Han	Virtual YouTuber (iTuber)	Seed	http://www.dooribun.com/
DIGISONIC	Kim Ji-Heon	EX-3D-based spatial audio (EX-Space)	Series A	http://www.digisonic.com/
RECON Labs	Ban Seong-Hoon (Vincent Ban)	3D asset manufacturing solution (Plicar)	Series A	https://www.reconlabs.ai/
MARVRUS	Lim Se-Ra	Metaverse learning (Meemz) Metaverse smartfarm (METAFARM)	Series A	https://www.marvrus.com/
Mediafront	Tae-Seon Yoo	VR exhibition and theme park	Series B	https://www.mediafront.kr/
Vive Studios	Kim Se-Gyu (Stanley Kim)	Virtual reality content creation Virtual production (VIT) Virtual human (VIPLE)	Series B	http://www.vivestudios.com
SALIN	Kim Jae-Hyeon (Jason Kim)	Pet community (Omoomo) Event platform (GOVENT) Metaverse platform (ReadyPlay)	Seed	https://salin.co.kr/
Sangwha	Jeong Beom-Jun	AI robot filming/editing studio (DEEPEYE)	Series C	https://www.sangwha.com/
seerslab	Chong Jin-Wook (Michael Chong)	Face AI Camera DigitalHuman	Series B	https://seerslab.com/#/
Archidraw	Lee Ju-Sung (Eric Lee)	3D interior design (Archisketch)	Series A	https://www.archisketch.com/
Urbanbase	Ha Jin-U	Virtual interior design platform (style AI)	Series C	https://blog.naver.com/urbanbaseinc
AFUN Interactive	Kwon Do-Kyun (DK Kwon)	Digital Celebrity Management DigitalHuman	Series A	http://afun-interactive.com/
CREVERSE	Kim Hyung-Jun	Bouncy	Series D	https://creverse.com/
CLO Virtual Fashion	Boo Jung-Huk/ Jaden Oh	3D Virtual Clothes	Series C	https://www.clovirtualfashion.com/
PERFECT STORM	Park Gun-Soo/ Park Kyoung-Je	AR/VR content development Web Metaverse platform	Series A	https://www.perfect-storm.net/
P&C SOLUTION	Choi Chi-Won	Augmented reality glasses (METALENSE)	Series A	http://www.pncsolution.co.kr/
Hodoo Labs	Kim Min-Woo	Hodoo English	Series A	https://hodooschool.com/

V . Invest Seoul with you



Invest Seoul is a foreign investment promotion agency established by the Seoul Metropolitan Government to create an investment environment that is friendly to foreign investors, with the aim to transform Seoul into an attractive destination for global investments.

We create quality jobs by attracting leading global companies to Seoul and provide promising companies in Seoul with robust growth opportunities by establishing connections with global investors.

We are committed to providing more detailed and diverse customized services in conjunction with specialized industrial organizations, field-specific private experts, and the central government.

Invest Seoul's support service by phase



Investment incentive

Cash Grants	Cost support for building or refurbishing cutting-edge technology & business factories and offices. Cost support for land or real estate purchase, rents or construction, capital goods and R&D goods purchase, infrastructure, employment, education and training.
Tax Exemption and Reduction	When foreign investors are newly building factories/offices or investing 2 million USD or more, they can enjoy a reduction on acquisition and property tax. Also, they will be exempt from tariffs, individual consumption tax and value-added tax.
Subsidies for Employment and Education/ Training	Global foreign investors investing in Seoul's 8 new growth powerhouse industries (IT/ convergence, green industries, digital contents, business services, fashion/design, finance, tourism/convention, and biotechnology) can receive subsidies for employment and education & training via signing MOU on foreign investment attraction business.



Seoul begins
Metaverse navigation
beyond
Virtual and
Augmented Reality