

ArtTech Ecosystem Development for Cultural and Creative Industries in Lithuania

Lithuania

2023/24 KSP POLICY BRIEF

Presented by the MOEF, Republic of Korea

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Preface

In an era marked by rapid technological advancements and global interconnectedness, the importance of knowledge sharing has become more crucial than ever. It enables us to tackle complex global issues more effectively and promotes inclusive growth. When diverse knowledge and experiences converge, innovation is fostered, problem-solving capabilities are enhanced, and overall societal progress and prosperity are achieved.

In this context, the exchange of development experiences between countries offers invaluable insights. It allows countries to learn from each other's successes and challenges, thereby enhancing their capacity to formulate and implement effective government policies. Korea's economic development journey, filled with practical lessons learned through trials and errors, provides a rich repository of knowledge. This includes not only conventional industrial policy but also expertise in addressing various policies and technologies pertinent to the Fourth Industrial Revolution.

Knowledge Sharing Program (KSP), launched by Korea's Ministry of Economy and Finance (MOEF) in 2004, has served as a vital platform for sharing Korea's development experiences globally over the past 20 years. In addition to embedding joint research outcomes into the policies of partner countries, KSP has advanced various international projects and highlighted the value of knowledge sharing in tackling global challenges together.

Since its inception, the Korea Development Institute (KDI) has participated in implementing the KSP, collaborating with one hundred countries. As Korea's leading think tank, the KDI has addressed a broad spectrum of issues faced by partner countries, from industrial development to digital transformation. During the 2023/24 KSP cycle, the KDI has undertaken seventeen policy consultation projects reflecting the needs of the partner countries.

Among the notable projects, the 'ArtTech Ecosystem Development for Cultural and Creative Industries in Lithuania', led by Lithuania's Ministry of Culture, exemplifies the spirit of international cooperation. On behalf of the KDI, I extend heartfelt gratitude to the Government of Lithuania, particularly His Excellency Minister Simonas Kairys, His Excellency Vice Minister Vygintas Gasparavičius, Ms Deimantė Zutelienė, Ms. Daiva Nazarovienė and Ms. Reda Aleliūnaitė, for their unwavering support. I also wish to acknowledge the KSP consultation team—Senior Advisor Dr. Heenam Choi, Principal Investigator Professor Taejun Lee, researchers Dr. Seung Hyeok Baek, Dr. Youngil Park,

Dr. Gin Song, Dr. Jeehyun Kim and Mr. Hyucktae Park, as well as local consultants Ms. Elena Ruikytė, Mr. Tautvydas Pipiras, and Ms. Ieva Gurklyte. Special thanks also go to the Center for International Development (CID) at KDI, particularly Executive Director Dr. Jungwook Kim, Project Manager Dr. Kiwan Kim, and Project Officer Ms. Heera Kim, for their constant dedication. The successful completion of this project is a testament to their exceptional efforts.

The 2023/24 KSP Policy Brief has been prepared to offer strategic insights and practical solutions for both senior policymakers and practitioners. Designed for enhanced accessibility and readability in mind, this brief aims to better serve the policy demand from our partner countries. We sincerely hope that it will prove to be a valuable tool in the policy-making process.

I firmly believe that the collaboration fostered through KSP will pave the way for further economic cooperation, enhancing mutual learning and deepening the bonds between Lithuania and Korea, ultimately contributing to our sustainable development.

Cho, Dongchul
President
Korea Development Institute

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Summary

Lithuania's ArtTech sector shows mid-high growth compared to neighboring EU countries, driven by government interest and proactive policies. However, comprehensive national policies, support systems, and structured collaboration frameworks are needed to achieve better outcomes. This study proposes several key strategies to promote the growth of Lithuania's ArtTech sector.

Key Policy Recommendations

Building ArtTech Innovation Ecosystem

1. Invest in ArtTech R&D

- Develop new ArtTech industries utilizing digital technologies such as AI, big data, and IoT.
- Support companies in entering domestic and international markets through consulting and export assistance.
- Create a national open data platform to aggregate and analyze entrepreneurship activities, supporting evidence-based policy-making and collaboration.

2. Foster an Inclusive ArtTech Innovation Ecosystem

- Strengthen public-private partnerships to transform institutions, policies, and governance.
- Engage the public in mission-oriented projects and create an ArtTech platform government.
- Promote accessible entrepreneurship and investments by utilizing Industry 4.0 technologies to drive innovation and reduce barriers to entry.

3. Create a Supportive Governance and Policy Framework

- Operate government bodies flexibly to address urgent issues efficiently.
- Reduce administrative burdens for the ArtTech sector by providing tailored support and automating processes.
- Establish a foundation to foster new ArtTech industries through digital technologies and support international market development.
- Establish a reliable ArtTech government with integrated public services and strong data security to build stakeholder trust and global competitiveness.

4. Develop Human Capacity and Prepare for the ArtTech Workforce

- Implement policies that support startups to rapidly build a government-led startup ecosystem, eventually transitioning to self-regulation.
- Formulate government strategies to support diverse ArtTech startups and prevent investment disparities to ensure sustainable growth.

5. Promote International Cooperation

- Utilize advanced technologies, promote knowledge exchange, and expand market opportunities through global partnerships and collaborative R&D projects.
- Align domestic policies with global standards to enhance Lithuania's competitiveness in the ArtTech sector.

6. Establish an "ArtTech Lab"

- Establish a government innovation hub to foster collaboration and innovation.
- Focus on planning, creation, production, distribution, and enterprise development across different ArtTech domains, thereby contributing to national economic growth and job creation.

Improving policy Finance System for ArtTech

1. Allocate Fixed Capital for CCI Promotion

- Ensure funding programs support creative content regardless of the financial capacity of companies.
- Develop a valuation system and assemble a pool of experts in CCI to accurately assess content value.

2. Establish a Content Valuation System

- Develop a content valuation tool and government guarantee system to attract private investment.
- Utilize public funds as a catalyst to encourage private investments in the CCI sector.

3. Adopt Korea's Fund of Funds Model

- Ensure effective utilization of funds dedicated exclusively for the CCI sector by adopting best practices from Korea's fund of funds approach.

Fostering Creative Talents and Startups

1. Develop a Creative Talent Plan and Performance Management System

- Align mid- to long-term strategic directions with annual action plans.
- Implement a comprehensive evaluation framework to assess outcomes and provide ongoing feedback from trainees and industry stakeholders.

2. Establish a “Content One Campus” Specialized in ArtTech

- Promote collaboration among government, universities, businesses, and private institutions.
- Provide funding and develop educational programs integrating technology and culture.

3. Secure Diverse Content IP Embedded in Lithuanian Context

- Develop strategies for acquiring and utilizing key resources to increase success potential.
- Use cost-effective methods such as web novels and webtoons to create flexible content.

4. Create Specific Funding Programs for ArtTech Companies

- Increase visibility and financial accessibility for ArtTech initiatives within the Innovation Agency framework.
- Conduct background studies on successful foreign practices to develop strategies and measure program impacts.

5. Design a Transparent Program Implementation Process

- Implement a transparent process to identify promising companies with limited access to finance and human resources.
- Ensure efficient use of resources, support industry growth, and maintain global competitiveness.

6. Identify Success Stories Through “Selection and Focus”

- Provide focused support to promising companies with high growth potential to create success stories.
- Establish clear criteria and a solid selection and performance management system to ensure effective support and foster a thriving ArtTech ecosystem.

By implementing these strategies, Lithuania can build a dynamic and innovative ArtTech ecosystem, driving economic growth and improving its global position in the CCIs.

1. ArtTech Innovation Ecosystem of the Republic of Korea and Lithuania: Focusing on National Strategies and Policy Directions for the ArtTech Innovation Ecosystem

1.1. Introduction

The cultural and creative industries (CCIs) are crucial to economic development, generating employment opportunities, income, and significant economic benefits. They drive innovation and promote social well-being and inclusion, encompassing various sub-sectors such as advertising, architecture, crafts, cultural education, design, fashion, film, music, and more (OECD, 2022). CCIs involve producing physical or digital cultural goods and services. In the digital age, CCIs face unique challenges and opportunities, particularly with rapidly advancing digital technologies.

The global pandemic has prompted many governments to re-evaluate their economic models, with CCIs emerging as a crucial element in the pursuit of resilient recovery. This sector's potential can be realized by addressing sector-specific vulnerabilities, including elevated rates of precarious employment and structural fragility, and leveraging opportunities from digital transformation. To thrive, CCI institutions must adapt to changes in technology, politics, and the economy.

Lithuania has seen significant growth in its CCIs sector, especially during the pandemic, marked by increased employment and the number of CCI companies. The Lithuanian government aims to continue this growth through a focus on digital transformation, known as the ArtTech. This approach integrates advanced technologies into creative processes and develops innovative solutions for cultural challenges.

This report offers evidence and guidance to Lithuania's Ministry of Culture on maximizing the economic and social impacts of CCIs in the digital era. It draws insights from the Republic of Korea, a leader in digital transformation within CCIs, providing valuable insights and policy recommendations. Korea's strategic use of digital infrastructure, public-private partnerships, and innovation ecosystems in CCIs serves as a valuable reference for Lithuania.

The study examines international discussions on CCIs, analyze Korea's CCIs policies, and assesses their relevance to Lithuania. It proposes strategies for the development of Lithuania's ArtTech sector, aiming to build a strong, innovative CCIs sector that fosters economic growth and social inclusion in the digital age.

1.2. Developing an ArtTech Ecosystem for Cultural and Creative Industries (CCIs)

1.2.1. Global Perspectives in CCIs as a Driver of Economic and Social Development

Innovation ecosystems are critical to economic and social advancement. It is, therefore, important to understand the concepts of systems, innovation, innovation systems, and ecosystems. A system is the process of transforming inputs into outputs through interactions, while innovation involves introducing something new and useful (Godin, 2015). In ecological terms, an ecosystem refers to the flow of matter and energy through interconnected subsystems (Shaw and Allen, 2016). Adner (2006) defines an innovation ecosystem as a cooperative arrangement where companies combine their products to create integrated solutions. These ecosystems include actors, artifacts, collaboration, competition, activities, institutions, and co-evolution.

The CCIs are an important economic driver with strong growth potential (OECD, 2022). In 2018, CCIs accounted for 7% of the total number of enterprises and 2.2% of the gross value added (GVA) in OECD countries. In major cities, cultural and creative employment constitutes a significant part of the labor market. The CCIs sector encompasses a wide range of organizations such as libraries, cultural centers, film studios, and global streaming services, primarily composed of small businesses and freelancers.

Despite the severe impact of COVID-19 on CCIs, digitalization is transforming cultural engagement and introducing new business models. This digital shift is positioning CCIs as important platforms within innovation ecosystems. In such an ecosystem, open innovation promotes dynamic interactions among actors and stakeholders. Consequently, CCIs form a symbiotic relationship with the innovation system, requiring the timely provision and restructuring of institutions, policies, and resources.

The focus of the CCIs innovation ecosystem is on the economic and social impacts amplified by digital transformation. National commitments to digital transformation and

international cooperation are crucial for maintaining and advancing the CCI innovation ecosystem. Therefore, effective policy support and evidence-based decision-making are essential to maximizing the benefits of CCIs and promoting sustainable development.

1.2.2. CCIs Innovation Ecosystem in Korea

Based on data from the Ministry of Culture, Sports and Tourism (MCST, 2024) of the Republic of Korea, domestic sales in the CCIs increased by 9.9%, from 137.5 trillion KRW in 2021 to 151.1 trillion KRW in 2022.

Table 1.
Overall Size of Korea's CCIs

Category	2018	2019	2020	2021	2022	Growth Rate (2021-2022)	CAGR (2018-2022)
Revenue (trillion KRW)	119.6	126.7	128.7	137.5	151.1	9.9%	6%
Exports (billion USD)	88.1	96.2	102.5	119.2	132.4	6.3%	8.3%
Employment (10,000 persons)	64.5	66.7	68.3	64.2	64.8	5.4%	- 0.7%
Number of Companies (10,000)	10.5	10.4	10	10.9	11.5	5.7%	2.2%

Source: MCST (2024).

Export growth also showed a significant increase of 6.3%, reaching 13.24 billion USD in 2022. The compound annual growth rate of exports from 2018 to 2022 was 8.3%, significantly outpacing the overall industry average of 3.1%.

Table 2.
Export Scale of Korea's CCIIs

(Unit: Million USD)

Category	2018	2019	2020	2021	2022	Growth Rate (2021~2022)	CAGR (2018-2022)
Games	6,411.5	6,657.8	8,193.6	8,672.9	8,981.8	3.6%	8.8%
Music	564.2	756.2	679.6	775.3	927.6	19.6%	13.2%
Broadcasting	478.4	539.2	692.8	718.0	948.0	32%	18.6%
Knowledge Information	633.9	649.6	692.0	660.9	701.4	6.1%	2.6%
Publishing	249.0	214.7	346.0	428.4	375.1	- 12.4%	10.8%
Characters	745.1	791.3	715.8	413.0	389.4	- 5.5%	- 14.9%
Advertising	61.3	139.1	119.9	258.2	327.7	27%	52.1%
Content Solutions	214.9	227.9	233.2	244.5	252.5	3.3%	4.1%
Animation	174.5	194.1	134.5	156.8	159.4	1.6%	- 2.2%
Comics	40.5	46.0	62.7	82.0	107.6	31.3%	27.7%
Film	41.6	37.9	54.2	43.0	71.4	66%	14.5%
Total	9,615.0	10,253.9	11,924.3	12,452.9	13,243.0	6.3%	8.3%

Source: MCST (2024).

Employment within the CCIIs sector grew by 5.4%, in 2022, reaching 645,800 jobs, with a striking 71.1% of the workforce being 39 years or younger, showing the industry's strong appeal to younger generations. In particular, the gaming, music, broadcasting, and over-the-top (OTT) industries are key drivers of CCIIs growth, contributing significantly to increase in export revenues.

Table 3.
Korea's CCIIs and Industrial Export Statistics

(Unit: Billion USD, %)

Category	2018	2019	2020	2021	2022	CAGR (2018-2022)
All industries	6,0486.6	5,422.3	5,125.0	6,444.0	6,835.8	3.1%
CCIIs	96.2	102.5	119.2	124.5	132.4	8.3%
Semiconductors	1,295.2	965.9	1,018.4	1,304.4	1,321.5	0.5%
Display Panels	117.4	51.9	40.8	36.0	25.3	-31.9%
ICT Equipment	306.0	325.7	367.8	468.9	450.7	10.2%
Home Appliances	72.9	87.3	72.6	84.2	100.0	8.2%
Vehicles	382.5	404.5	356.3	443.2	516.8	7.8%

Source: MCST (2024).

Government policies, led by the MCST and the Korean Creative Content Agency (KOCCA), focus on integrating digital technologies, expanding financial support for policies, promoting digital inclusion, and reducing regulatory hurdles. These efforts are supported by strategic initiatives such as market research, policy formulation studies, and copyright protection.

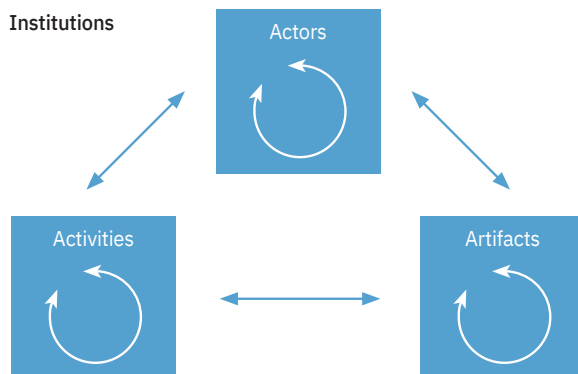
Table 4.
Policy Directions and Initiatives for Korea’s CCIs

Policy Direction	Key Initiatives
Integration of Digital and New Technologies	<ul style="list-style-type: none"> Utilization of metaverse blockchain, content development support for new technology-based webtoons, etc.
Expansion of Policy Financing	<ul style="list-style-type: none"> Expansion of venture investment funds to foster companies, provision of strategic content investment, etc.
Digital Inclusion	<ul style="list-style-type: none"> Approaches to content for the socially disadvantaged, enactment of content promotion laws for balanced regional development, etc.
Regulatory Adjustment and Easing	<ul style="list-style-type: none"> Incorporation of games into culture and arts, inclusion of OTT operators in the broadcasting video production, relaxation of regulations for new technology convergence contents.

Source: KOCCA (2022a).

Korea’s CCIs innovation ecosystem is organized around four key elements: institutions, actors, activities, and outputs, including policies, content, resources, and production processes. Essential sectors such as gaming, movies, cartoons, and music are utilizing digital platforms and emerging technologies to enhance production, distribution, and consumption, thereby contributing to the global presence and impact of Korea’s CCIs. These efforts have positioned Korea at the forefront of the OECD Digital Government Index.

Figure 1.
Main Components of Innovation Ecosystem



Source: Granstrand and Holgersson (2020).

The innovation ecosystem in Korea places a strong emphasis on digital infrastructure, ongoing investment in digital technologies, and tailored strategies for the digital transformation of CCIs. Key strategies to foster digital CCIs include building a digital ecosystem, establishing a socioeconomic foundation, and improving policies and governance.

To sustain the growth and global competitiveness of Korea’s CCIs, it is crucial to secure policy support, reform the legal system, develop human resources, and strengthen international collaborations.

Figure 2.
Policy Framework on Korea’s National Strategies and Enablers for CCIs’ Digital Transformation

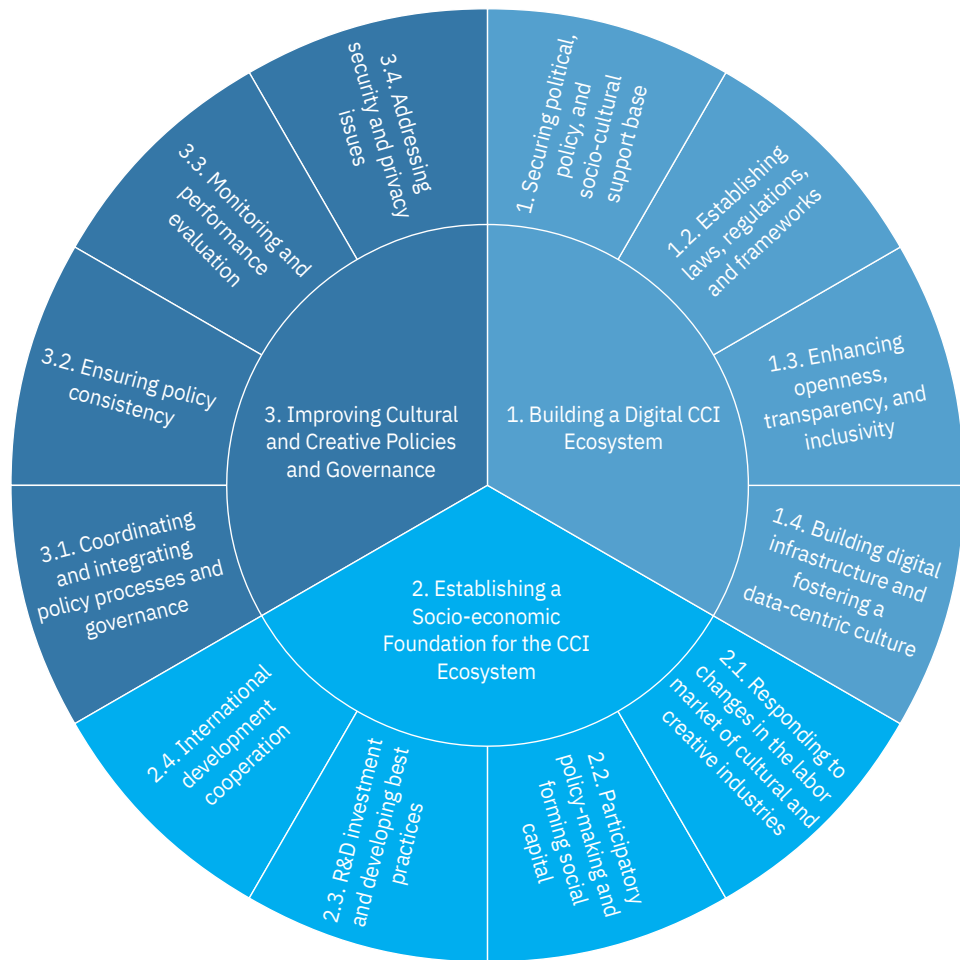


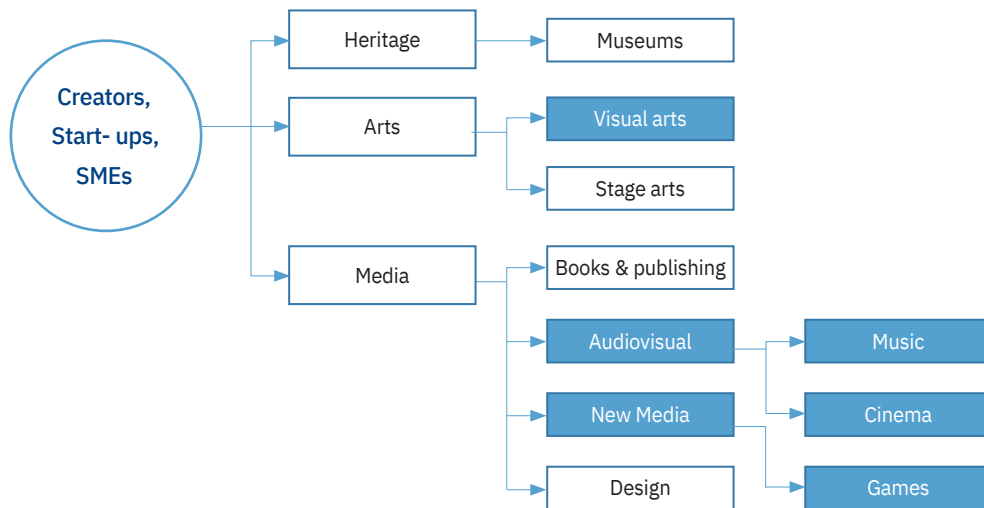
Table 5.
Korea's National Strategies and Enablers for CCI's Digital Transformation

Core Strategies	Enabling Factors	Example Tasks
Building a Digital CCI Ecosystem	Securing political, policy, and socio-cultural support base	Publicizing goals for fostering digital cultural and creative industries
	Establishing laws, regulations, and frameworks	Formulating policies for fostering cultural and creative industries and revising existing regulations
	Enhancing openness, transparency, and inclusivity	Developing an ethical code for the cultural and creative industry ecosystem
	Building digital infrastructure and fostering a data-centric culture	Establishing a data source storage and management system for the content creation ecosystem
Establishing a Social-economic Foundation for the CCI Ecosystem	Responding to changes in the labor market of cultural and creative industries	Nurturing young talent in cultural and creative industries
	Participatory policy-making and forming social capital	Establishing educational institutions for nurturing young talent
	R&D investment and developing best practices	Enhancing technology development investment and utilizing new technologies in content and priority sectors
	International development cooperation	Supporting global market development through private sector collaboration and strengthening support for overseas enterprises
Improving Cultural and Creative Policies and Governance	Addressing security and privacy issues	Developing copyright protection technologies to proactively respond to new technologies and industries
	Monitoring and performance evaluation	Measuring data source management related to the content creation ecosystem and evaluating the impact of best practices
	Ensuring policy consistency	Applying feedback from policy monitoring and performance evaluation to future policies
	Coordinating and integrating policy processes and governance	Establishing and operating media and content-related experimental labs or councils

1.2.3. Policy Review and Analytical Perspective into Lithuania's CCIs

Lithuania's cultural sector has seen significant growth with a 14.2% increase in value added in 2022. The CCI sector in Lithuania includes media, gaming, film, music, and visual arts, all showing notable growth despite the absence of a unified definition.

Figure 3.
Classification of the CCIs and the Priority Areas



Source: Compiled by the authors based on ArtTech Research (Ceizarienė, Gurklytė and Ruikytė, 2022).

In Lithuania, this sector is referred to as ArtTech. ArtTech represents an innovative ecosystem in the rapidly evolving cultural and creative industries, where creators, cultural organizations, startups, and SMEs come together. As a new concept in Lithuania, ArtTech lacks formal policies or frameworks, and relies on existing business and cultural regulations for support. There are no structured performance management systems for ArtTech, and the sector faces challenges due to the absence of a cohesive strategy, formal governance, and clear roles among government entities, which hinders effective coordination, resource allocation, and practical implementation.

The ArtTech sector is still in its early stages, lacking formal policies, strategies, and regulatory frameworks. In response, Lithuanian government ministries, led by the Ministry of Culture, play various roles in the ArtTech ecosystem. Government policies, including the Lithuanian National Development Plan and the EU Investment Program for 2021-2027, prioritize the development of CCIs. However, challenges such as dependence on EU funding, rapid technological advances, and a lack of systematic approach are hindering the sector's growth.

This study conducted four rounds of focus group interviews (FGI) and in-depth interviews with experts from various sectors of the ArtTech industry in Lithuania. Participants included representatives from the government, industry, academia, civil society organizations, investors, and start-ups. The study identified gaming, movies and TV shows, music, and books as the most influential and economically promising areas for future ArtTech innovation. It also compared relevant policies and successful cases from Korea's CCI, discussing future strategies for each ArtTech field and the role of the government. In this study, nurturing and enhancing innovation ecosystem of ArtTech policies and industries should be sustained, emphasizing the roles of both the public and private sectors and the importance of international cooperation. Finally, it concluded by outlining the implications for short-, medium-, and long-term strategies for Lithuania's ArtTech sector, along with relevant government policies and strategies.

Table 6.
Strategic Considerations of ArtTech Core Industries

Areas	Considerations
Gaming	<ul style="list-style-type: none"> • Lithuania's game industry is experiencing growth and expansion. • There is a potential for more content to adopt game formats in the future. • Many experts from the ArtTech sector entering the game industry
Movies and TV Shows	<ul style="list-style-type: none"> • Many professionals in the music and film industries are creating works that are both technologically proficient and artistically valuable. • Active networking and collaboration in the film industry facilitate potential public-private partnership (PPP) projects. • There is a prevalent distrust of public institutions in the film industry, which is a detracting factor. However, integrated management at the national level can provide solutions.
Music	<ul style="list-style-type: none"> • Professionals in many music and film industry are technically proficient and produce work of high artistic merit. • Despite Lithuania having a talented pool of professionals in film and drama, its music industry lacks the international competitiveness necessary to fully benefit from the EU.
Books and Other (Cartoons, etc.)	<ul style="list-style-type: none"> • For digital-based content such as webtoons and content requiring digital acceleration, such as books, the level of advancement in digital technology and infrastructure poses a major challenge for growth.

Table 7.
Main Findings of Multi-Stakeholder Interviews

Steps	Initial	Mid-term	Long-term
Strategies	Building a foundation for the ArtTech industry	Strengthening the ArtTech industry base and leveraging technology	Strengthening the international competitiveness of the ArtTech industry
Details	Public data operating environment development	Technical and data-related longer-term government investment	Strengthening international cooperation in the ArtTech industry
	Digital Technology workforce development and utilization support	Technology development, joint research and investment through expanded private partnerships	
	Digital systems stability and security	Establish a system for measuring and evaluating digital system effectiveness	
Suggestions	+		
	<p>After establishing the foundation of the ArtTech industry, market expansion is a priority. In order to improve the quality and efficiency of ArtTech, public private partnership should be mandated. Collaboration in domestic and international markets becomes more important.</p>		

The study's SWOT analysis of Lithuania's ArtTech sector reveals weaknesses in institutional readiness, governance, and infrastructure. It recommends focusing on industries with high market demand and growth potential, prioritizing the gaming industry first, followed by movies and dramas, which benefit from active networking and collaboration. Emphasis is placed on public-private partnership (PPP), globalization within the EU, and enhancing marketability. The industry should explore export opportunities through private sector involvement and international cooperation.

Table 8.
SWOT Analysis of Lithuanian ArtTech Innovation Ecosystem

Strengths	Opportunities
<ul style="list-style-type: none"> • The country’s potential for new forms of expression and previously unattainable ideas using the latest technologies, and the growth rate of the actual related market is in the upper middle of the European countries. • Many music and film industry professionals are technically proficient and produce work of high artistic merit. • Active networking and collaboration with the Latvian film industry • Growth of the Lithuanian animation industry and a small increase in the number of creators • Lower fees for NFT artworks and other sales platforms compared to traditional markets (galleries, auctions) • Rich heritage and strong museum and visual arts content related to it • The growth of the gaming industry 	<ul style="list-style-type: none"> • As the gaming industry grows and spreads to other sectors, more content is likely to be processed and delivered in game formats • Growing the ArtTech sector and attracting younger people • International cooperation between ArtTech fields and, active international projects
Weaknesses	Threats
<ul style="list-style-type: none"> • Lack of general knowledge of new technologies (artificial intelligence, virtual reality, augmented reality, virtual reality) and lack of education and training on their use in the ArtTech space • This leads to difficulties and shortages in training professionals related to the ArtTech industry, such as cultural creative industry managers, programmers, and producers. • Despite the need for diversification in the ArtTech industry, there is a problem of talent being concentrated in the gaming industry, where higher salaries can be earned. • Lack of collaboration with ArtTech industries, public institutions, universities and research centers, incubators, and creative industry associations to collaborate and co-create content • Lack of in-house infrastructure and facilities to utilize creative technologies such as VR • Inadequate funding for new technology development and adoption • Government’s task to drive new technology development is fragmented and inexecutable • Lithuania’s music industry is not internationally competitive 	<ul style="list-style-type: none"> • Lack of data on ArtTech growth makes it difficult to monitor and improve contributions to the national economy • Uncertainty in developing new technologies due to rapid changes in intellectual property protection and cryptocurrency markets • Unpredictable future utilization due to the immaturity of NFT technology, such as the speculative and volatile nature of the cryptocurrency market. • Rapidly changing regulations for the ArtTech industry and varying standards for calculating revenue size across countries can be confusing • Distrust of the film industry in public institutions

Policy recommendations include promoting digital innovation, establishing legal frameworks, and strengthening international cooperation. Effective governance is essential, requiring policy coherence, continuous monitoring, and addressing privacy and security issues. Implementing these strategies will enable Lithuania to strengthen its ArtTech innovation ecosystem and enhance its global competitiveness.

Table 9.
Current Status and Future-proof Agendas for Reinforcing Lithuanian ArtTech Innovation Ecosystem

Policy Dimension	Current Status
1. Facilitate Digital Transformation for CCIs	<p>1.1 Political, Policy, and Socio-cultural Support</p> <ul style="list-style-type: none"> • Under the 2021-2030 National Development Plan, the Ministry of Culture has established the Culture and Creativity Development Program (CCDP). • However, there is no formal structure or governance to achieve this, including collaborative processes with key departments such as the Ministry of Economy and Innovation, or the emergence and role clarification of key initiatives to implement the CCDP.
	<p>1.2 Establish a Legal and Regulatory Framework</p> <ul style="list-style-type: none"> • Since the ArtTech sector is subject to the rules and laws of general business activities, it requires special regulations to address the needs of minority groups.
	<p>1.3 Strengthening Openness, Transparency, and Inclusion in the CCI</p> <ul style="list-style-type: none"> • The lack of an overall legal and regulatory framework for the ArtTech sector makes it impossible to resolve socio-technical issues of digital divide and create and document a code of ethics for ArtTech industry operations at this stage.
	<p>1.4 Build Digital Infrastructure and Data and Create a Data-driven Culture</p> <ul style="list-style-type: none"> • Currently, digital infrastructure and data management related to ArtTech are under the purview of other ministries than the Ministry of Culture. For example, the Lithuanian National Data Agency is located in the Ministry of Economy and Innovation, Ministry of Finance, and Ministry of Justice.
2. Create a Socio-economic Foundation for CCI Innovation Ecosystem	<p>2.1 Responding to Labor Market Changes in the CCIs</p> <ul style="list-style-type: none"> • There is no higher education programs or programs with universities to train professionals in ArtTech research and scientific activities, leading to a lack of support for ArtTech talent. • Lithuania's film industry has potential for growth, but majority of film workers are self-taught.
	<p>2.2 Participatory Policymaking and Social Capital Formation</p> <ul style="list-style-type: none"> • In the absence of a nationally-led ArtTech industry incubator, stakeholder-led business model development by ArtTech actors and improved engagement of collaborators (investors, accelerators, consultants, etc.) is not possible.
	<p>2.3 Investing in R&D and Developing Best Practices</p> <ul style="list-style-type: none"> • Due to a lack of financial resources, including financial products such as accelerator funds, venture capital, loans, and guarantees, the interventions and engagement encouragement at stage 2.2 are not leading to R&D investments and the identification of key cases. • Currently, CCI financing is largely funded by EU funds, which can be invested in traditional cultural activities or in areas that can achieve both economic and social value.
	<p>2.4 International Development Cooperation</p> <ul style="list-style-type: none"> • Currently, a collaborative framework with EU countries is being established, but strategic matching with partner countries based on the key areas of the national art-tech industry has not been carried out.
3. Improve Interoperable Policy and Horizontal Governance Environment	<p>3.1 Policy Process and Governance of Coordination and Integration</p> <ul style="list-style-type: none"> • As seen in the current state of leadership and political commitment, the lack of official structures and governance, such as the emergence and role clarification of key initiatives, makes coordination of business cooperation attempts inefficient in the current situation.
	<p>3.2 Consistency of Policies</p> <ul style="list-style-type: none"> • There is no entity to monitor the consistency of the implementation of digital technology and innovation activities, including key initiatives to foster the ArtTech industry and related industries.
	<p>3.3 Monitoring and Performance Evaluation</p> <ul style="list-style-type: none"> • There are no programs for implementing and monitoring ArtTech specialization. • This leads to a lack of collaboration between ArtTech specialties to keep the ArtTech industry in the hands of each institution or individual specialists.
	<p>3.4 Troubleshooting Security and Privacy Issues</p> <ul style="list-style-type: none"> • Copyright issues related to security and privacy are increasingly high on Lithuania's and the EU's strategic agendas, making it important to address regulatory concerns.

1.3. Policy Implications

Lithuania's ArtTech sector demonstrates mid-high growth compared to neighboring EU countries, driven by government interest, proactive policies, and organic growth from individual experts. However, the establishment of comprehensive national policies, support systems, and structured collaboration frameworks could significantly improve outcomes. This study proposes six key suggestions for the growth of the ArtTech ecosystem.

① *Invest in ArtTech Research and Development (R&D)*

- Development of new ArtTech industries by utilizing digital technologies such as AI, big data, and the Internet of Things (IoT).
- Support for companies to penetrate domestic and international markets through tailored consulting and export assistance.
- Establishment of a national open data platform to aggregate and analyze entrepreneurship activities, supporting evidence-based policy-making.
- Standardization of ArtTech-related public data to be machine-readable and elimination of silos to facilitate effective collaboration and innovation.

② *Foster an Inclusive ArtTech Innovation Ecosystem*

- Strengthening of public-private partnerships to transform institutions, policies, and governance.
- Engagement of the public in mission-oriented projects and establishment of an ArtTech platform government to position Lithuania as a leader in ArtTech innovation.
- Promotion of accessible entrepreneurship and investment by utilizing Industry 4.0 technologies, driving innovation and reducing barriers to entry.

③ *Shape an Enabling Governance and Policy Environment*

- Flexibility in operating government organizations to efficiently address urgent issues.
- Reduction of administrative burdens for the ArtTech industries by providing tailored support and automating processes.
- Establishment of a foundation to foster new ArtTech industries through digital technologies and support for their expansion into international market.
- Building a trusted ArtTech government with integrated public services and strong data security to ensure stakeholder trust and global competitiveness.

④ *Build Human Capacity and Prepare for the ArtTech Labor Market*

- Implementation of startup support policies to quickly develop a government-led startup ecosystem, transitioning to self-regulation.
- Formulation of government strategies to support diverse ArtTech startups and prevent investment disparities, ensuring sustainable growth.

⑤ *Promote International Cooperation*

- Access to advanced technologies, promotion of knowledge exchange, and expansion of market opportunities through global partnerships and joint R&D initiatives.
- Collaboration with global partners to achieve breakthrough innovations and alignment of policies with global standards, and enhancement of Lithuania's competitiveness in the ArtTech sector.

⑥ *Establish an "ArtTech Lab"*

- Creation of a government innovation hub to support cooperation and innovation activities.
- Emphasis on planning, creation, production, distribution, and enterprise development across various ArtTech domains.
- Contribution to national economic growth and job creation through this collaborative platform for various stakeholders in the ArtTech sector.

Table 10.
Policy Suggestions for Lithuania ArtTech

Policy	Description
Investing in ArtTech R&D	<ul style="list-style-type: none"> • Enhance the quality and impact of ArtTech services. • Utilize AI, big data, and IoT technologies. • Support market expansion for companies. • Create a national platform for open data. • Improve data integration.
Fostering an Inclusive ArtTech Innovation Ecosystem	<ul style="list-style-type: none"> • Develop public-private partnerships • Increase sector participation • Reduce barriers to entry • Implement Industry 4.0 technologies • Strengthen support for startups
Shaping an Enabling Interoperable Governance and Policy Environment for ArtTech	<ul style="list-style-type: none"> • Establish flexible, transparent systems • Operate ArtTech organizations with flexibility • Reduce administrative burdens
Building Human Capacity and Preparing for ArtTech Labor Market	<ul style="list-style-type: none"> • Enhance the efficiency of the startup ecosystem • Attract key industry players • Create angel investment funds • Support a diverse range of startups • Ensure balance investment distribution
Promoting International Cooperation	<ul style="list-style-type: none"> • Form partnership with global entities • Facilitate knowledge sharing and exchange • Engage in joint R&D projects • Align with international standards • Strengthen cultural exchanges
Institutionalizing ArtTech Lab	<ul style="list-style-type: none"> • Establish the organization and structure of ArtTech Lab • Support diverse ArtTech sectors • Promote public-private cooperation • Foster innovation and entrepreneurship • Manage ESG for sustainable growth

2. Public and Private Finance for Boosting ArtTech Ecosystem

2.1. Introduction

Lithuania needs detailed guidelines for establishing and revitalizing a phased public-private fund system for the promotion of CCI from a long-term perspective. This study aims to analyze how financial policy frameworks have been introduced and operated for creative content businesses in Korea, providing specific benchmarking data to enhance Lithuania's ArtTech ecosystem. To ensure a comprehensive analysis, successful cases of content production, distribution, and consumption based on financial policies and systems in Korea's CCIs were examined. Prior to the analysis of the Korean case study, this research will analyze the funds available to Lithuania as an EU member country and the financial system related to its Art-Tech CCIs, allowing for the consideration of the applicability of a public-private financial system for CCIs in Lithuania.

2.2. Financing of Cultural and Creative Industries

2.2.1. Financing of CCIs in the EU

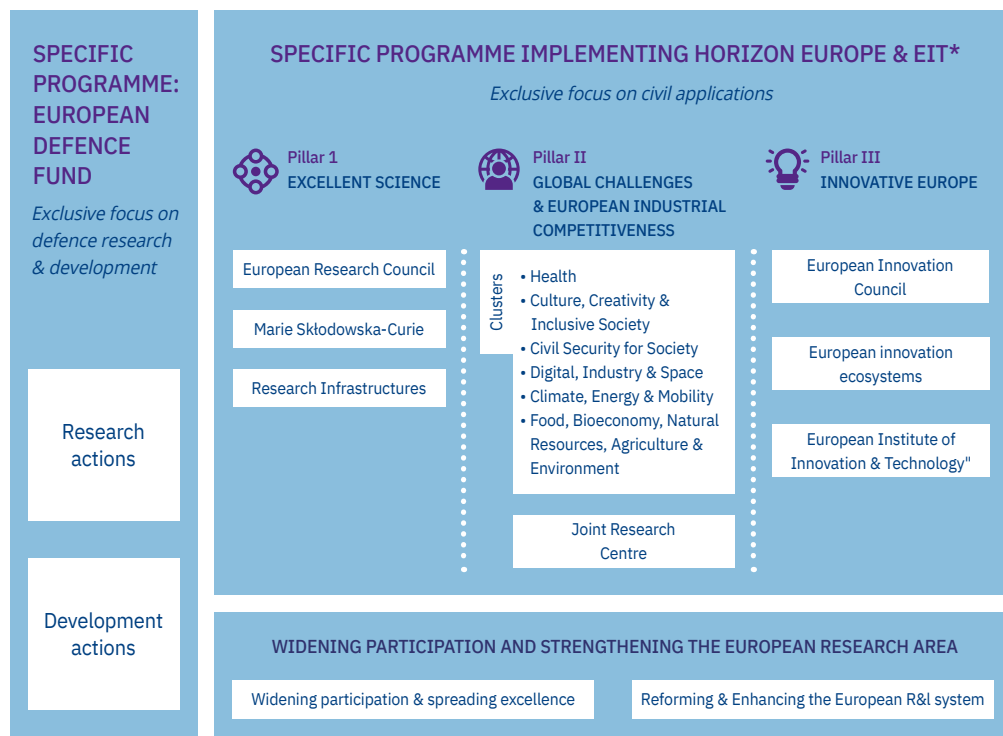
At the EU level, the CCIs sector employs 8.02 million people, contributes 3.95% to the EU value added (477 billion EUR) and involves 1.2 million companies, 99.9 % of which are SMEs (European Commission, 2021a). The prevalence of SMEs in CCIs sectors underscores the importance of a strong funding system for the CCIs sector at the EU level. There are five EU programs providing funding for CCIs: Horizon Europe, Digital Europe, InvestEU Fund, Creative Europe, and Recovery and Resilience Facility.

- ① **Horizon Europe** is the EU's key funding program for research and innovation. Financing for CCIs entities is available under Pillar II and III.
- Under Pillar II, the **Cluster 2 (Culture, Creativity & Inclusive Society)** provides R&I funding dedicated to cultural heritage and CCIs, focusing on deepening knowledge of CCIs, their role as innovation drivers, their interactions and spill-overs to other sectors, and the ways to strengthen these industries. It also supports deeper research into specific sectors such as filmmaking and music.
- **Cluster 4 (Digital Industry and Space)** offers support for applications of a media

data space, a virtual reality (VR) media lab, and extended reality (XR) technologies and applications.

- Under Pillar III, the European Institute of Innovation and Technology (EIT) established a new Knowledge and Innovation Community (KIC) for the CCI in 2023. The EIT Culture & Creativity initiative focuses on Europe’s CCI sector.

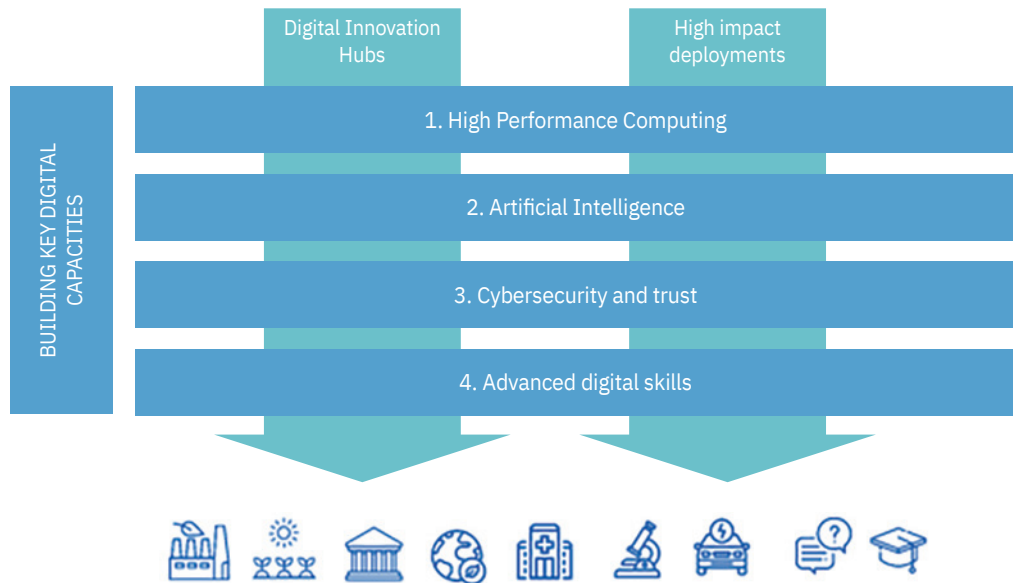
Figure 4.
Horizon Europe Program



Source: The European Commission (2021b).

② **The Digital Europe Program (DEP)** is a financial support tool aimed at boosting the digital transformation of society, the economy and public administrations across EU Member States and program partner countries. Centered on digital transformation, the program funds cultural digitization, digital skills development, and innovative content creation, enabling artists and cultural organizations to thrive in the digital age.

Figure 5.
Digital Europe Program



Source: The European Commission (2021b).

③ **InvestEU** fuels cultural infrastructure, creative startups, and cross-border collaborations. There are three types of funding in InvestEU Fund:

- Guarantees
- Equity: Under InvestEU Equity, the EIF provides equity investments and co-investments to, or alongside funds in the areas of venture capital, private equity, and private credit that pursue generalist, specialized or mixed investment strategies.
- MedialInvest: Part of the InvestEU program and being operated by the EIF, MedialInvest is a dedicated equity investment instrument designed to foster European audiovisual productions and distribution businesses.

④ **Creative Europe** is specifically dedicated to the European CCIs and is crucial for supporting recovery. It comprises three strands:

- Culture Strand: It supports initiatives promoting cross-border cooperation, platforms, networking, and literary translation, encouraging artistic exchange and audience engagement.
- MEDIA Strand: It is designed to strengthen the audiovisual sector's competitiveness.
- CROSS-SECTORAL Strand: This strand promotes activities aimed at helping the media adjust to the structural and technological challenges.

⑤ **Recovery and Resilience Facility** is the centerpiece of NextGenerationEU program, the EU's 800-billion-EUR temporary recovery instrument to support economic recovery from the COVID-19 pandemic and build a greener, more digital, and more resilient future. This facility offers grants and loans to support reforms and investments in the EU Member States for a total of 723.8 billion EUR in current prices, ensuring that culture remains resilient and adaptable.

2.2.2. Financing of CCI in Lithuania

The Ministry of Culture and the Ministry of Economy and Innovation are the main ministries in Lithuania providing financial support for the CCIs sector. The Ministry of Culture allocates the largest share of state financing for culture, with several institutions offering direct institutional funding specifically for the CCIs sector. These funding programs support artists, cultural organizations, and CCIs entities across Lithuania (Ministry of Culture of the Republic of Lithuania, 2022).

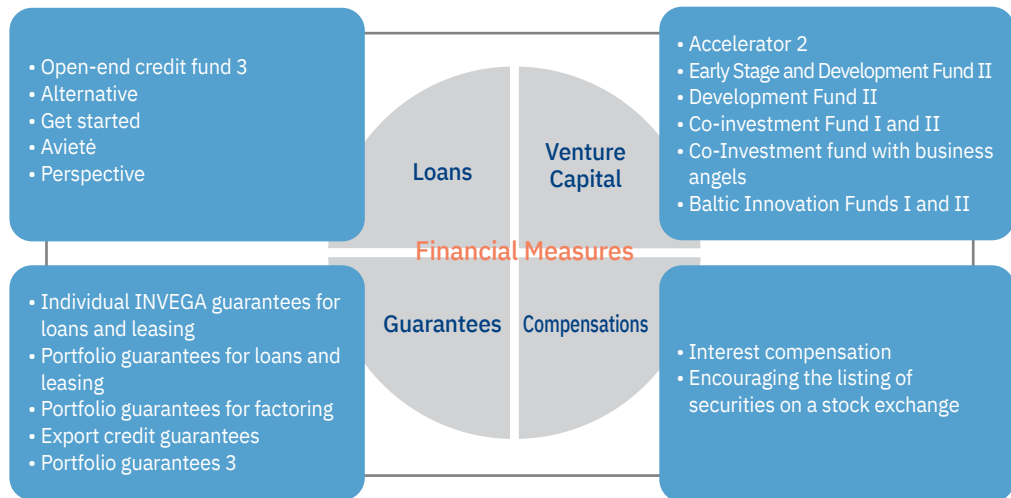
To strengthen the Lithuanian economy and address recent challenges, the Ministry of Economy and Innovation has introduced a series of measures totaling almost 1 billion EUR. This funding supports a wide range of private and public sector projects in business, innovation, investment, digitalization of government and business, and the promotion of the green economy.

In 2023, the Ministry of Economy and Innovation launched five public funding instruments. Three of these primarily support companies' growth cycles related to R&D, while the other two—digitizing SMEs and non-technological innovations—are applicable to CCI companies:

- Digitizing SMEs encourage SMEs to invest in new digital tools that allow them to create e-stores and visual configurations of their products.
- Non-technological innovations target SMEs that have been in business for at least two years and have a turnover of at least 75 000 EUR.

Additionally, INVEGA, a national financial institution established by the state, manages other public funding instruments. The financial support measures administered by INVEGA available to SMEs are shown in Figure 6:

Figure 6.
Financial Measures by INVEGA



Source: The European Commission (2021b).

- Open Credit Fund 3 (OCF3) offers access to project finance on favorable terms at below-market prices to start a new business or maintain and expand an existing one.
- Alternative Lending for Business: SMEs that comply with the SME status, according to a financial intermediary's assessment, are eligible to apply for this instrument if they are sustainable and their planned cash flows are sufficient to fulfill their obligations.
- Crowdfunding Loans (Avietē) enables SMEs to borrow through crowd funding platforms.

INVEGA also provides four main types of guarantees:

- Individual Guarantees for Loans facilitate access to funding by offering solutions to unattractive or insufficient loan conditions.
- Guaranteed Leasing helps address issues of insufficient or unattractive securities for financial institutions, facilitating access to financing sources.
- Portfolio Guarantees enhances access to finance for SMEs when their offered security is unattractive or insufficient for a financial institution.
- Export Credit Guarantees enables companies to expand their export markets in countries with non-marketable or temporarily non-marketable risks, minimizing the potential risk of customer insolvency and increasing export volumes.

2.2.3. SWOT Analysis

The researchers analyzed the strengths and weaknesses, opportunities and threats that Lithuania has for the promotion of the CCI sector based on the analysis of the current situation in Lithuania. Through this, we intended to use it to derive practical strategies. The specific results of the analysis are as follows.

Table 11.
Result of SWOT Analysis

Strength	Weaknesses
<ul style="list-style-type: none"> • Promote CCIs and government policies • Presence of public funds for businesses operated by Ministry of Economy and Innovation (since 2023) • Existence of public funds operated by INVEGA 	<ul style="list-style-type: none"> • Insufficient funds to be invested for the development and application of new technologies for ArtTech sustainability • Since the existing public funds cover the entire industry, the public funds that CCIs can utilize are extremely limited. • Absence of CCIs valuation and rating system • Lack of specialized national institutions aimed at fostering CCIs and lack of own budget • Lack of information and knowledge about publicly funded programs and grants for CCIs workers and SMEs
Opportunities	Threats
<ul style="list-style-type: none"> • Strong commitment to fostering the ArtTech sector • International cooperation with the ArtTech sector and active and future-proof in international projects • Acquire macro/micro benchmarking information necessary for fostering the ArtTech industry • Availability of EU funds 	<ul style="list-style-type: none"> • Rapidly changing new technology market such as AI • Difficulties in using EU funds (due to severe competition and not meeting the conditions for receiving support) – both an opportunity and a threat • Lack of coordination between CCIs-related ministries (e.g., the Ministry of Culture and the Ministry of Economy and Innovation) and private networks

2.2.4. Financing of Content Industry in the Republic of Korea

Before the Content Valuation Center was established in 2016, content companies in the Republic of Korea, mostly small businesses without collateral, faced significant challenges in securing funding. As a result, the content industry was undervalued, and the existing credit-guarantee review system did not reflect the characteristics of the content industry, hindering its growth.

Due to these challenges, content companies struggled to secure necessary funds. Recognizing this issue, the Education and Culture Committee at the National Assembly emphasized in 2014 that content valuation and credit guarantee evaluation should be managed by experts in the content industry. They argued that “content valuation” should form the foundation of the content finance policy. Consequently, in 2016, the Ministry of Culture, Sports and Tourism appointed a valuation agency, leading to the official opening

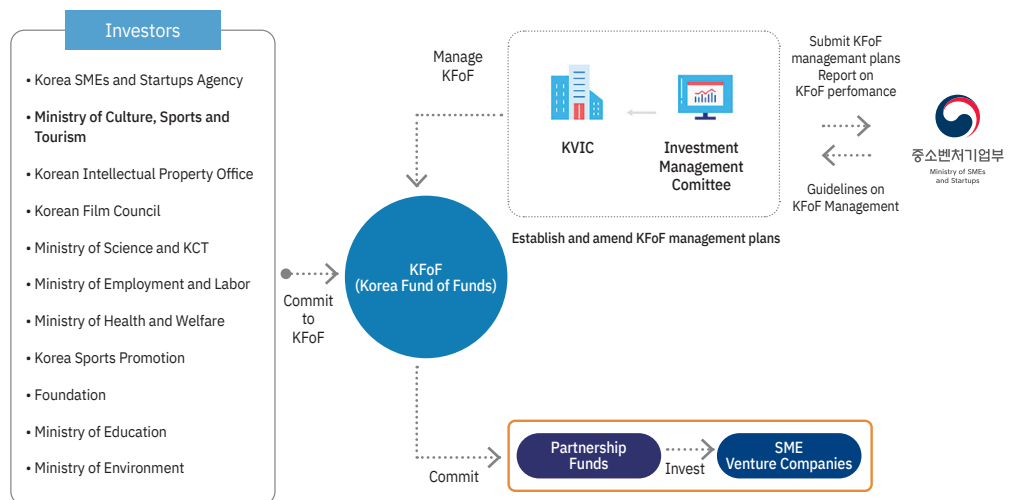
of the Content Valuation Center within the KOCCA. Since then, it has become possible to assess the value of content in a manner that reflects the industry's specific characteristics, and various support mechanisms for content companies have been developed.

2.2.4.1. Motae Fund (Fund of Funds)

The Motae Fund was established in 2005 under the Act on Special Measures for the Promotion of Venture Business to provide stable funding for venture investments. Rather than directly invest in companies, the fund invests in private funds (partnerships) and is financed by government funds and budgets. Contributors include the Ministry of SMEs and Startups, the Korea SMEs and Startups Agency, the Ministry of Culture, Sports and Tourism, the Korean Intellectual Property Office, the Korean Film Council, the Ministry of Science and ICT, the Ministry of Employment and Labor, the Ministry of Health and Welfare, the Korea Sports Promotion Foundation, the Ministry of Education, the Ministry of Environment, and the Ministry of Land, Infrastructure, and Transport. These entities invest in the fund of funds (Motae Fund), which then invests in collective investment funds that manages the assets of the Motae Fund.

The Ministry of SMEs and Startups provides guidelines for the management of the Motae Fund to the Korea Venture Investment Corp (KVIP), which submits a management plan and reports on its performance to the Ministry. The KVIP is a specialized organization that manages the assets of the Motae Fund.

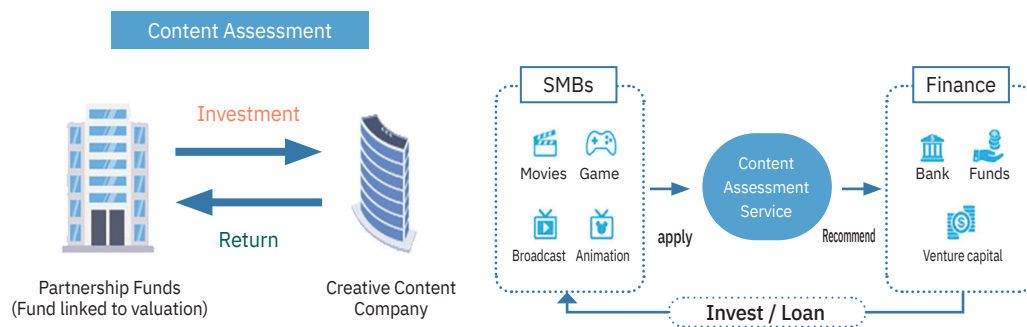
Figure 7. Operating System of Motae Fund



Source: KVIP (2024).

Content Companies submit applications to KOCCA, which evaluates the applications based on the submitted documents. Based on the evaluation results, the agency recommends contents companies to financial institutions. The content valuation service supports financing by comprehensively evaluating the commercialization potential of content (from completion of creation to sales) and recommending it to the financial sector (MCST, 2022).

Figure 8.
Motae Fund and Content Assessment Service

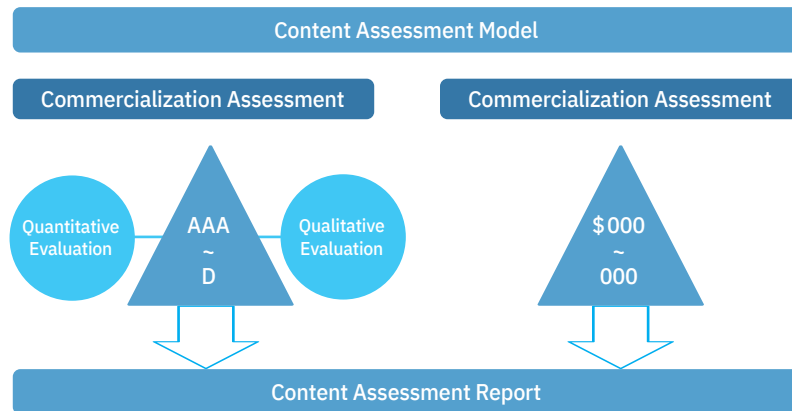


Source: KVIP (2024).

The main tasks of the Content Assessment Center are to provide content valuation services and facilitate financing for content businesses. The center uses this model to make investment recommendations and loan endorsement recommendations. There are two main assessment models: the commercialization assessment and the economic assessment model.

- **Commercialization Assessment Model:** This model assesses the potential for content commercialization and assigns a comprehensive grade ranging from AA to D. The model calculates commercialization potential by classifying factors that affect the completion and market success of content into items and sub-items, each evaluated with a weighted score. Quantitative evaluation includes factors such as content competitiveness, project profitability, and production infrastructure. Qualitative evaluation involves the expertise of professionals in the content field, financial experts, and academic scholars.
- **Economic Assessment Model:** This model assesses the monetary value of content. Quantitative evaluation estimates the net present value through the analysis of economic value, sales, discount rate, and cost structure. Qualitative evaluation, which incorporates expert opinions, assesses economic feasibility. The results of the economic assessment are expressed in monetary terms, typically in dollars.

Figure 9.
Content Assessment Model



Note: • Fields: 10 genres (Movie, Game, Animation, Broadcast, Musical etc.)

- Quantitative Evaluation: Categories (content competitiveness/project profitability/production infra)-Subcategories Items
- Qualitative Evaluation: 5 experts including distribution, production, finance, and academia
- Economic Assessment: Estimation of NPV (Net Present Value) through analysis of content's economic value, sales, discount rate, and cost structure

2.2.4.2. Guarantee Finance System

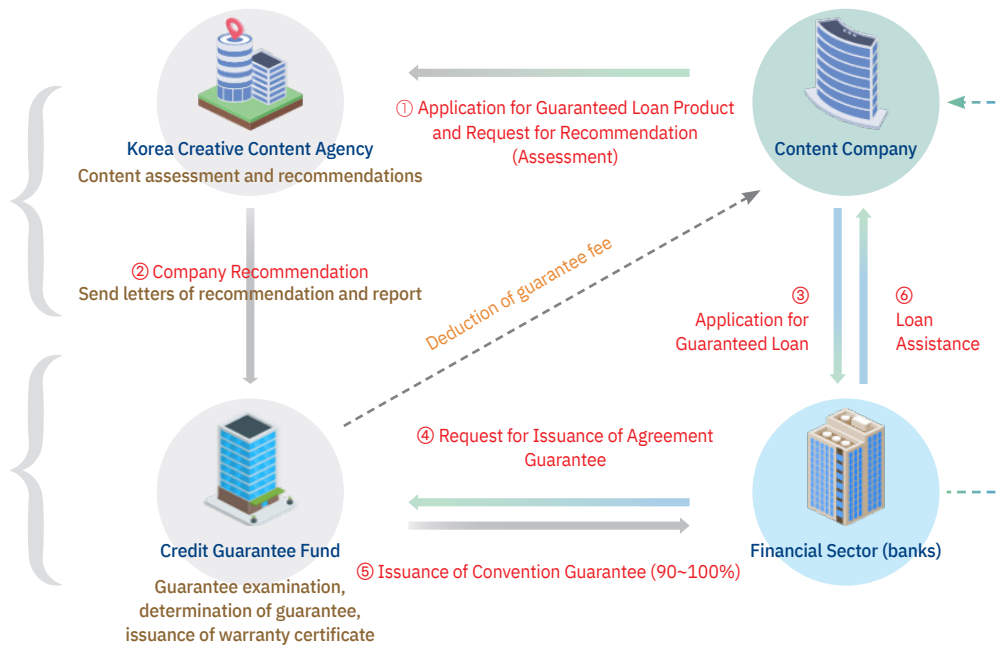
KOCCA, under the Ministry of Culture, Sports and Tourism, operates a loan guarantee support system in partnership with credit guarantee agencies such as the Credit Guarantee Fund and the Korea Technology Finance Corporation, which issue the letter of loan guarantee. The system is tailored to reflect the unique characteristics of the CCIs.

The system operates as follows:

- ① A content company applies for a guaranteed loan and requests an evaluation.
- ② KOCCA conducts an evaluation through the Valuation/Implementation committee and recommends the company based on the results.
- ③ The content company applies for an execution of a guaranteed loan to a financial institution.
- ④ The financial institution requests the Korea Credit Guarantee Funds to issue the letter of a loan guarantee.
- ⑤ The Korea Credit Guarantee Funds then issues the letter of a loan guarantee; and
- ⑥ The financial institution executes the guaranteed loan.

In this process, the Korea Credit Guarantee Funds is responsible for reviewing the application and deciding whether to issue the letter of loan guarantee.

Figure 10.
Overview of Guarantee Finance System



There are four representative types of Loan Guarantee programs:

- ① **K-Content Guarantee System for Cultural Contents Production Companies:** This system supports companies to secure stable working capital through customized financing support for each stage of content production, including planning, production, and commercialization. It covers 10 genres.
- ② **Content IP Guarantee System:** This program supports the funding required for the commercialization of content IP licensing.
- ③ **K-Contents Innovation Growth Guarantee Program:** This program funds K-content innovation growth projects to strengthen the innovation capabilities and global competitiveness of ArtTech companies in the digital economy. It supports a wide range of businesses, including those preparing or in the process of exporting global content, virtual content (including OTT content), and new technology convergence content projects utilizing specialized technologies.
- ④ **Cultural Industry Completion Guarantee System:** This system provides financing support for producers to complete their content creation by evaluating the potential for production completion and success, provided that they have already signed a distribution contract with a cultural product distributor (such as a distributor or broadcaster).

Figure 11.
Types of Content Finance System in Korea

Classification		Eligibility	Content	Amount of Support	Genre
Content Value Assessment		Domestic creative content company	Assess the possibility of content to be commercialized(completion and success), recommend to investment companies and financial institutes * Support for attracting investment through recommendation of investment companies	37.5 billion KRW (28,227,324 USD)	Game / Movie Animation Comics/Webtoon Broadcasting Musical Concert Music e-learning Character Exhibition Publication
Loan Guarantee	Loan guarantee for cultural content production companies	Domestic creative content company	Funding for each stage of the project, such as content planning, production, and commercialization	Up to 300 million KRW (224,382 USD) Up to 500 million KRW (373,971 USD) Up to 1 billion KRW (747,943 USD)	Game Broadcast Content Music Animation Movie Performance Comics/Webtoons Character Publication Digital Content
	Loan Guarantee for content IP	Domestic creative content IP utilization company (Content companies and heterogeneous companies)	Funding for IP licensing commercialization of companies that promote business using content IP	Around 1 billion KRW (747,943 USD)	
	K-contents innovation growth loan guarantee	Domestic creative content company	Funding for K-Content Innovation Growth* Projects * Global/non-face-to-face/new technology convergence content production and distribution	Up to 1 billion KRW (747,943 USD)	
	Cultural Industry Completion Guarantee	Domestic creative content company	Funding for content production to companies that have signed contracts with distribution companies	Around 1.5 billion KRW per project (1,116,486 USD)	

2.3. Policy Implications

An efficient policy finance system requires the creation of a virtuous circle involving ministries, responsible institutions, financial resources, evaluation systems, the private financial sector's cooperation, and industry awareness. This analysis suggests several strategies to help Lithuania develop its own action plan for the ArtTech sector.

① *Fixed Capital for CCI Promotion*

Focusing on the ArtTech industry, it is essential to allocate a fixed amount of capital for promoting the CCIs. Most funding programs in Lithuania currently target R&D and new technology-based businesses that can demonstrate tangible revenue and have some financial ability to repay. However, there are few fund programs that support SMEs in the CCI sector. In summary, a funding program focusing on the “product”—creative content regardless of a company's financial ability—is rare.

② *Changing Perception of Investment Risk*

There is a need to shift the perception of investment risk. Lithuania should establish a valuation system and a pool of experts for the CCIs. For example, in Korea, the establishment of the content evaluation center has made it possible to evaluate content value reflecting the characteristics of the content industry and support content companies in various ways. Given the ever-changing nature of the content industry, the content valuation tool is continuously updated, with experts using both quantitative and qualitative analysis methods to increase predictability. This model can be beneficial for Lithuania. Furthermore, establishing a government guarantee system is essential for the CCI sector. Private company investments become much easier when public institutions guarantee a portion of the amount through a valuation system. Government-led public funds are important but should primarily serve as a catalyst to attract private investment, as the industry cannot thrive on public funds alone.

③ *Benchmarking Korea's Fund of Funds*

The study also recommends benchmarking how Korea's fund of funds operates. The Korean case was examined in detail, and fund-of-funds mechanisms were discussed as one of the best ways to ensure efficient utilization of funds exclusively for the CCI sector.

3. Training Creative Talents and Supporting Startups in ArtTech Ecosystem

3.1. Introduction

To foster and continuously expand Lithuania's ArtTech industry, it is very important to establish a system that systematically supports creative talent and startups, which are key elements of the industry. One of the most important factors contributing to the global success of Korea's CCI is the Korean government's systematic support policy. Since 2009, the Korean government has established KOCCA, a specialized content industry development organization. KOCCA has focused on supporting the three pillars of Korea's content industry: human resources, companies, and capital.

Lithuania's ArtTech sector and Korea's CCI share similarities in this respect. KOCCA's programs and representative projects for training creative talent and supporting business development can serve as a foundation for fostering Lithuania's ArtTech sector. However, it is important to adapt Korea's approach to fit Lithuania's internal and external conditions. Given Lithuania's rich cultural heritage, advanced ICT, and excellent human resources, the ArtTech sector has significant growth potential if supported by government-led industry support policies.

3.2. ArtTech Ecosystem in Lithuania and the Republic of Korea

3.3.1. Conceptual Framework

Creative talents are the cornerstone of innovation and product quality, particularly in the increasingly digitalized CCI. This digital transformation requires the integration of Information and Communication Technology (ICT) with traditional culture and art, creating a new paradigm of digital convergence. Consequently, there is a growing demand for specialized development personnel, global marketers, and planners who understand consumer needs to enhance the competitiveness of CCI.

Governments play a crucial role in establishing supportive ecosystems through policies, systems, laws, and budget allocations, ensuring startups can efficiently access

necessary resources such as talent, capital, and technology. The success stories of global companies like Apple and Google, which began as startups, highlight the importance of fostering startups for job creation and economic growth.

In CCI, creative talents are vital for driving innovation, engaging audiences, differentiating brands, influencing culture, and advancing industry evolution. These individuals must possess a blend of imagination, planning skills, business acumen, and technological proficiency. The rapid development of technologies, especially generative AI, significantly impacts creative processes by enhancing creativity and efficiency.

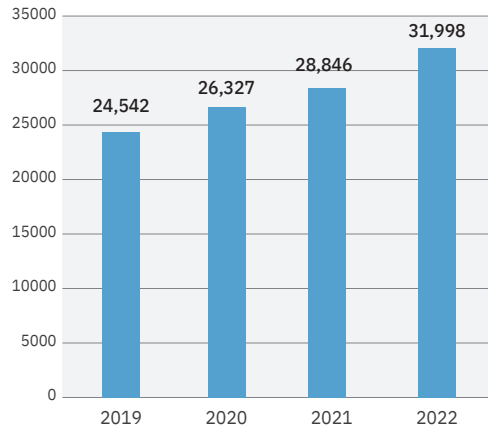
Supporting startups is essential for fostering innovation, economic growth, competition, and talent cultivation within CCIs. Key factors for sustained industry growth include a well-developed infrastructure, legal frameworks, and adequate funding, all of which are necessary to support the dynamic and evolving landscape of CCIs.

3.3.2. Current Status of ArtTech Ecosystem in Lithuania

According to the GEM 2023/2024 Global Report of the Global Entrepreneurship Monitor (GEM), Lithuania had about 1,000 startups, mostly targeting businesses. By 2023, entrepreneurial conditions had improved, particularly in out-of-school education, ease of entry, and government programs, although education within schools remained weak. The National Entrepreneurial Context Index (NECI) score recovered to 6.1 in 2023, ranking 4th among 49 economies. Despite high entrepreneurial awareness, with 70% of the population knowing a recent business starter and 60% perceiving good opportunities, the Total Early-stage Entrepreneurial Activity (TEA) rate dropped to 6.7% in 2023 from 12.7% in 2022, mainly due to a decrease in male entrepreneurs. However, the number of established business ownership nearly doubled to 15%, with most new entrepreneurs driven by necessity (GEM, 2023).

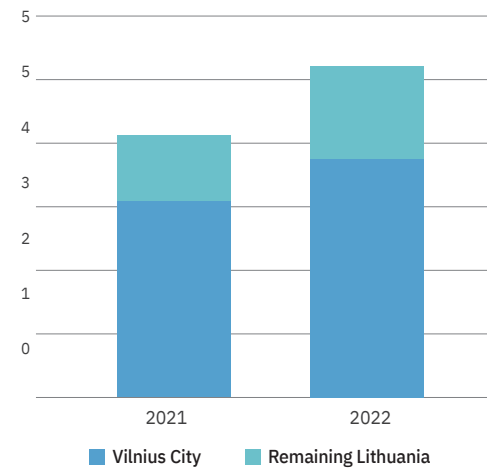
ArtTech in Lithuania represents the integration of creative industries and digital technologies but lacks a clear legal definition and specific statistical data. Information about the sector is currently derived from broader CCIs classifications, notably the comprehensive UNCTAD classification, which is more comprehensive than that of the EU's. According to the Culture Index of Municipalities 2022, new creative industries in Lithuania, including audiovisual media and new media, are primarily concentrated in Vilnius and Kaunas. These industries have experienced rapid growth, with the number of companies and turnover significantly increasing from 2019 to 2022.

Figure 12.
Number of companies in new creative industries
in Lithuania (2019-2022)



Source: Mažeikaitė, Kristina (2023).

Figure 13.
Turnover of companies in new creative industries
in Lithuania (billion EUR)



Source: Mažeikaitė, Kristina (2023).

Support for ArtTech in Lithuania is provided through broader business development and innovation programs managed by Innovation Agency Lithuania. This agency offers both financial and non-financial support across all stages of business maturity, from startups to established enterprises. Support policies also include initiatives like "Startup Lithuania," which fosters the innovation ecosystem. Several higher education institutions offer creative talent training programs that blend creative and business skills. Additionally, targeted programs like "Dizaino sparnai" support design-related fields, while the MEDIA sub-program of Creative Europe aids the film and audiovisual sectors.

Despite these efforts, the ArtTech sector still requires more specific strategies and support systems to fully realize its potential. This includes developing a clear legal definition, specific statistical tracking, and targeted support programs tailored to the unique needs of ArtTech industries.

3.3.3. SWOT Analysis

Researchers conducted a SWOT analysis to identify the strengths, weaknesses, opportunities, and threats associated with promoting the CCI sector in Lithuania based on the current situation. This analysis aimed to develop practical strategies for enhancing the sector. The specific results of the analysis are shown as Table 12.

Table 12.
SWOT Analysis of ArtTech in Lithuania (Creative talents/Startups)

Strength	Weaknesses
<ul style="list-style-type: none"> • Promote CCIs and government policies • Presence of public funds for businesses operated by Ministry of Economy and Innovation (since 2023) • Existence of public funds operated by INVEGA 	<ul style="list-style-type: none"> • Insufficient funds to be invested for the development and application of new technologies for ArtTech sustainability • Since the existing public funds cover the entire industry, the public funds that CCIs can utilize are extremely limited. • Absence of CCIs valuation and rating system • Lack of specialized national institutions aimed at fostering CCIs and lack of own budget • Lack of information and knowledge about publicly funded programs and grants for CCIs workers and SMEs
Opportunities	Threats
<ul style="list-style-type: none"> • Strong commitment to fostering the ArtTech sector • International cooperation with the ArtTech sector and active and future-proof in international projects • Acquire macro/micro benchmarking information necessary for fostering the ArtTech industry • Availability of EU funds 	<ul style="list-style-type: none"> • Rapidly changing new technology market such as AI • Difficulties in using EU funds (due to severe competition and not meeting the conditions for receiving support) – both an opportunity and a threat • Lack of coordination between CCIs-related ministries (e.g., the Ministry of Culture and the Ministry of Economy and Innovation) and private networks

3.3.4. Training Creative Talents and Supporting Startups in the Republic of Korea

3.3.4.1. Case Study 1: Training Creative Talents in Korea

① *KOCCA's Strategy for Training Creative Talent*

KOCCA aims to cultivate global leaders in convergence by providing training opportunities that enhance technology-based content creation skills. KOCCA's creative talent support system is categorized by the maturity stage of creative talents and the industry characteristics. Two key programs managed by KOCCA are the Creative Talent Partnership Program (CTPP) and the Content One Campus.

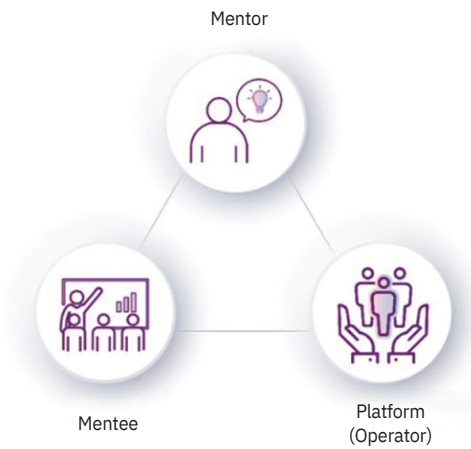
② *Creative Talent Partnership Program (CTPP)*

The CTPP supports young talents in developing creative capabilities and finding jobs in relevant creative industries. The program targets companies, organizations, and associations that can plan and offer apprenticeship mentoring on content creation to young creative talents.

③ *Content One Campus*

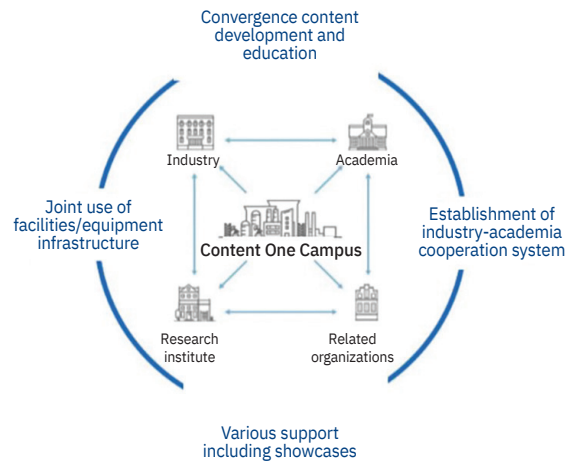
The Content One Campus program is an industry-academia-KOCCA collaboration program. In this program, the government provides financial support to university projects aimed at developing the creative capabilities of college students and provides them with on-the-job training in collaboration with industry.

Figure 14.
Creative Talent Partnership Program



Source: KOCCA (2023).

Figure 15.
Content One Campus



Source: KOCCA (2023).

3.3.4.2. Case Study 2: Supporting Startups in Korea

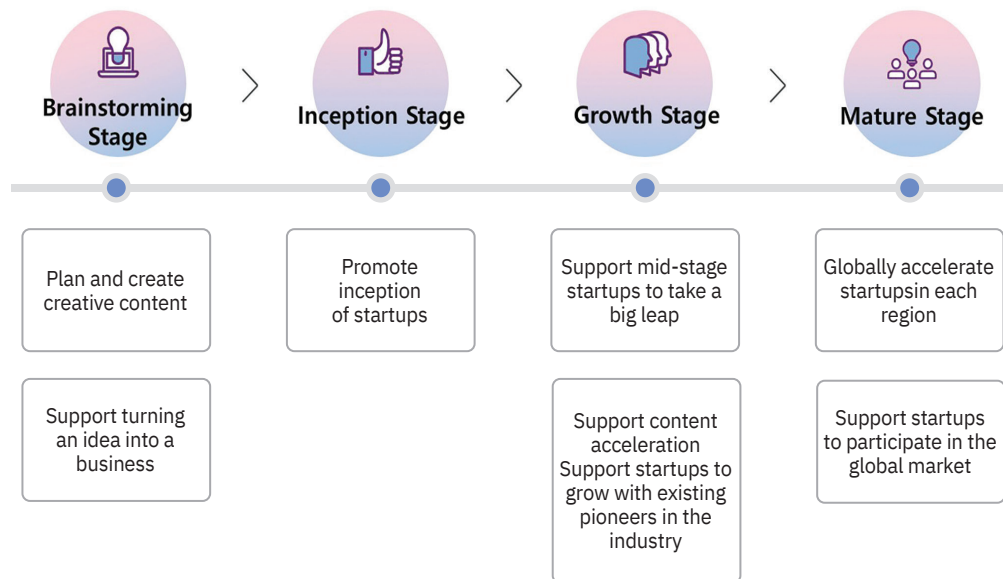
① *KOCCA's Strategy for Startup Support*

KOCCA's startup support programs are designed to provide comprehensive support for the development of startups. KOCCA is currently expanding the global expansion program for content companies, aiming to connect early-stage companies to international markets by taking advantage of the networks of large enterprises with a global reach.

② *Startup Businesses Support Program*

The Startups Business Supporting Program (SBSP) is a step-by-step support program for startups, guiding them from inception through all the stages of the growth phase. This program provides resources and assistance tailored to the needs of startups at various development phases.

Figure 16.
Startup Business Support Program



Source: KOCCA (2023).

③ *Incubating Program for Startups and SMEs*

The Incubating Program offers working space for startups and SMEs along with additional services such as training, consulting, investment facilitation, and networking opportunities.

- CKL Business Center offers training, consulting, and networking opportunities to startups.
- New Content Business Center provides business diagnosis services and custom support for technology-based content startups to secure investment.
- Game Hub Center supports game developers by providing working space and production facilities .

3.3. Policy Implications

① *Establishment of a Creative Talent Development Plan and Performance Management System Optimized for ArtTech*

Developing a systematic strategic direction that aligns mid- to long-term perspectives with annual action plans is crucial for fostering creative talent in the ArtTech sector. This involves setting clear objectives and milestones that guide the development of creative talents over time, ensuring their skills evolve in line with industry needs.

Additionally, implementing a sound evaluation framework is essential. This framework should measure outcomes and provide ongoing feedback from both trainees and industry stakeholders. Such a system will ensure continuous improvement and adaptation, allowing the talent development programs to remain relevant and effective in responding to the dynamic demands of the ArtTech industry.

Figure 17.
KOCCA’s Creative Talent Development Strategic Direction

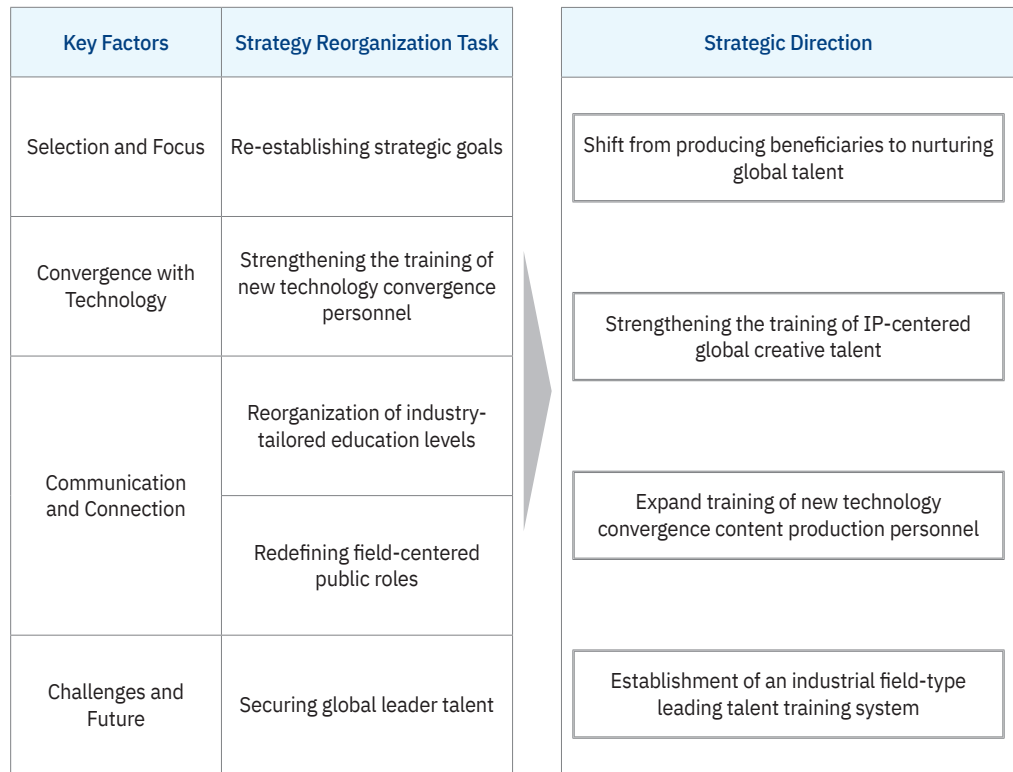


Table 13.
KOCCA’s guideline on establishing a short- and mid-term plan

Plan	Features of the Plan	Role and Expected Effects
Establishment of 5-year/10-year mid- to long-term plan	<ul style="list-style-type: none"> Presenting ideal talent Secure consistent direction 	<ul style="list-style-type: none"> Presenting a vision for nurturing -human resources in CCIs
Establishment of a 3-year short-term plan	<ul style="list-style-type: none"> Realizing short-term changes and results Discovering and promoting strategic projects 	<ul style="list-style-type: none"> Strengthening the public-private partnership policy model Activation of private (human/material) capital investment Discovery of strategic projects to realize mid- to long-term plans
Annual business plan	One-year action plan	<ul style="list-style-type: none"> Governance maintenance and operation (dedicated organization/council) Establishment of industrial partnerships Annual quality management

Inspection and Measures to Secure Execution Ability	
Checklist to Strengthen Execution Ability	Measures to Strengthen Execution Ability
<ul style="list-style-type: none"> Is the mid- to long-term vision appropriate? 	<ul style="list-style-type: none"> Discussion and expansion activities within the institution
<ul style="list-style-type: none"> Is step-by-step performance creation appropriate? 	<ul style="list-style-type: none"> Establishment of a 3-year strategic period and assignment of performance goals
<ul style="list-style-type: none"> Is the business implementation system appropriate? 	<ul style="list-style-type: none"> (Internal) dedicated organization - (MOU) establishment of a cooperative company system

Source: KOCCA (2022b).

② *Establishing a “Content One Campus” Specialized in ArtTech*

Creating a “Content One Campus” specialized in ArtTech can facilitate collaboration among government, universities, businesses, and private institutions. The government should provide funding and establish foundational policies, while universities develop educational programs that integrate technology and culture. Businesses can offer practical training opportunities, and private institutions can promote creativity and innovation through various projects. This collaboration aims to foster new content and business ideas, ultimately developing a new generation of creative talents.

③ *Securing Excellent and Versatile Content IP Embedded in Lithuanian Context*

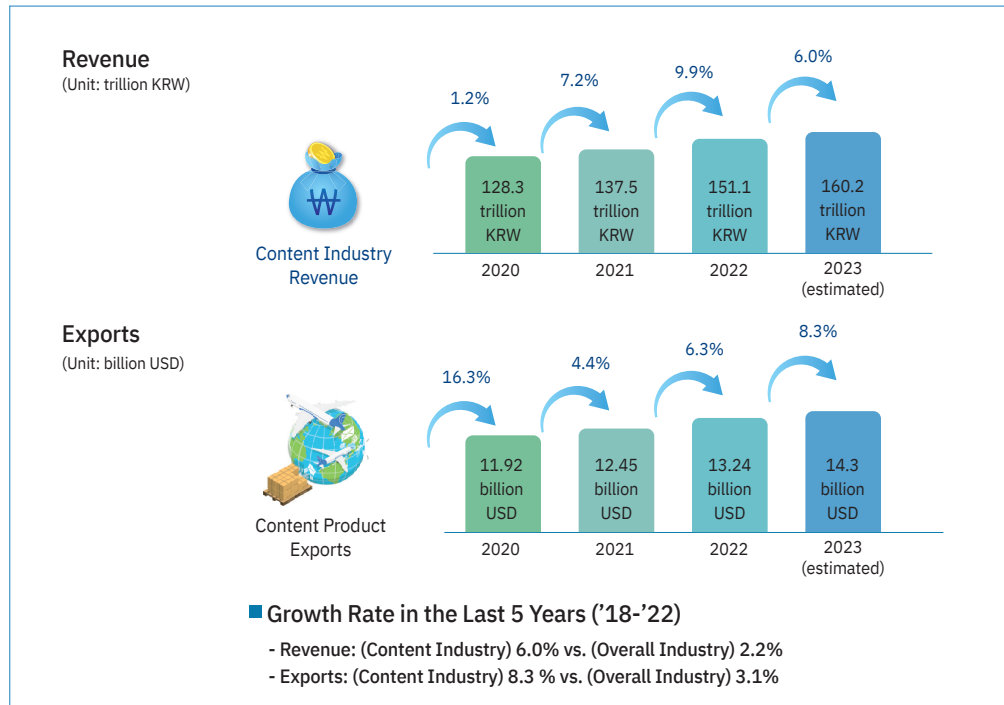
This involves formulating strategies for securing and utilizing key sources to increase success probability and create a virtuous cycle effect. For instance, utilizing cost-effective methods like web novels and webtoons, as seen in Korea, can be beneficial. These forms of content creation require minimal resources compared to traditional media and can easily be expanded across different platforms and genres.

④ *Securing budget and programs specialized for ArtTech companies*

In Lithuania, while the Innovation Agency provides business development support across various industries, there is a limited budget and few programs specifically for ArtTech companies. To address this, it is recommended that the Ministry of Culture establish dedicated funding schemes or support programs for ArtTech within the framework of the Innovation Agency. This approach would increase the visibility of ArtTech initiatives and improve financial accessibility for cultural and creative startups.

To achieve this, the government should conduct thorough background studies on successful foreign practices, such as those from Korea, to outline strategies, roadmaps, and potential impacts. Furthermore, incorporating a solid valuation and performance management system is crucial to select promising projects and measure program effects, ensuring a positive feedback loop for continuous improvement.

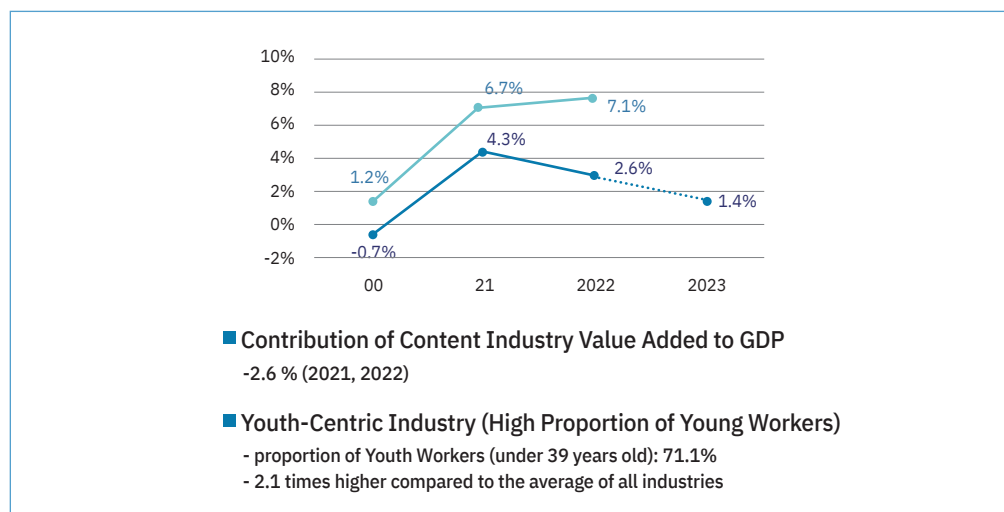
Figure 18.
Value of Korea’s CCIs



Note: Data for the graph was sourced from the Ministry of Culture, Sports and Tourism, Cultural Industry Statistics (2004-2009, Sum of 10 cultural industry sectors), Content Industry Survey (2010-2022, Sum of 11 specialized content industry sectors). The data for CCIs includes media and platform sectors such as broadcasting.

Source: KOCCA (2023).

Figure 19.
Content Industry Revenue Growth as Percentage of GDP



Note: The data was sourced from the Ministry of Culture, Sports and Tourism, Content Industry Survey (2022, 2024); Bank of Korea (2023); and Statistics Korea (2020).

Source: KOCCA (2023).

⑤ *Establishing a Well-structured Program Implementation Process*

Designing an effective support program for startups and SMEs requires a fair and transparent process to identify promising companies with limited access to finance and human resources. KOCCA's implementation process consist of several key steps and can serve as a model for Lithuania.

- **Announcement of Support Programs:** Publicize opportunities through official channels and hold information sessions.
- **Application Submission:** Require detailed business plans and budget proposals.
- **Document Review:** Conduct preliminary and expert reviews to assess feasibility and impact.
- **Interview and Presentation Review:** Evaluate applicants through interviews and presentations.
- **Final Selection:** Conduct final evaluations and announce recipients.
- **Agreement Signing:** Draft agreements detailing support conditions and fund usage.
- **Project Implementation and Management:** Monitor progress through interim reports.
- **Final Reporting and Settlement:** Require final reports and conduct financial settlements.
- **Performance Evaluation and Follow-up:** Evaluate project performance and provide follow-up support.

This structured approach ensures efficient resource use, promotes industry growth, and maintains global competitiveness.

Figure 20.
Growth Rate in the Last 5 Years ('18-'22)



Source: KOCCA (2023).

⑥ *Discovering Success Stories Through “Selection and Focus”*

Given limited budget and resources, it is crucial to focus support on promising companies with high growth potential to create success stories. These success stories can drive innovation, enhance the competitiveness of the ArtTech sector, and serve as benchmarks for other startups. Identifying such promising companies can be challenging due to information asymmetry. The rationale for supporting these companies is to help them overcome financial gaps that might hinder their market success. Policymakers should have clear criteria and design a selection and performance management system to ensure effective support and a thriving ArtTech ecosystem.

4. Conclusion

This study offers a comprehensive analysis of the ArtTech ecosystem in Lithuania, drawing on insights from Korea's experience in fostering CCIs. It examines the current state, challenges, and strategic recommendations for the growth of Lithuania's ArtTech sector. This policy brief is based on the policy recommendation report, which consists of three chapters. These chapters focus on critical aspects of the ecosystem, including national strategies, financing mechanisms, and the training of creative talents and support for startups. Each chapter draws comparisons and lessons from Korea's advanced CCI ecosystem, proposing strategic actions tailored to Lithuania's unique context.

Chapter 1 explored the CCIs innovation ecosystem of Korea and Lithuania, focusing on their national strategies and policy directions. The Republic of Korea's success in integrating digital technologies into its CCIs, particularly through the use of AI and big data in content production, has driven significant growth in these sectors. The country's investment in digital content hubs has been critical in supporting the development and international competitiveness of its CCI sector. Additionally, the government's efforts to promote digital transformation and support startups have been pivotal in maintaining Korea's competitive edge in these industries.

Conversely, while Lithuania's CCI sector has considerable potential, it currently lacks a unified policy framework and faces challenges such as limited funding, inadequate infrastructure, and fragmented governance. Lithuania's CCI policy framework is still in development and lacks structured performance management systems for ArtTech. Addressing these issues would require Lithuania to invest in its own ArtTech R&D, particularly in emerging technologies like AI, big data, and IoT. Implementing a national open data platform, similar to Korea's initiatives, would support evidence-based policymaking and foster a collaborative environment for innovation. Furthermore, strengthening public-private partnerships is crucial for transforming Lithuania's institutions, policies, and governance in the ArtTech sector.

Chapter 2 explored the role of public and private finance in enhancing the ArtTech ecosystem, examining various financing mechanisms employed by Korea. For example, Korea's "Motae Fund" (Fund of Funds) has been instrumental in providing stable funding for venture investments in the CCI sector. This fund has supported a wide range of creative startups, helping them scale and innovate by offering crucial financial backing

during their early stages. Lithuania could benefit from establishing a similar fund dedicated to ArtTech, offering financial support tailored to the needs of startups and SMEs in this industry. Moreover, implementing a content valuation system, like Korea's Content Valuation Center, would be another critical step for Lithuania. This system has allowed companies in Korea to accurately assess the value of their creative content, making it easier to secure financing from banks and investors. For instance, content valuation has enabled Korean films, games, and music projects to obtain funding based on projected revenues, rather than relying solely on traditional collateral. Establishing a government guarantee system for these investments could further encourage private sector participation in Lithuania, reducing the perceived risk associated with investing in creative industries. Korea's experience shows that such guarantees can be transformative, attracting private capital into sectors often seen as high-risk but high-return. By adopting these financial strategies, Lithuania can create a more supportive environment for ArtTech companies, facilitating their growth and innovation.

Chapter 3 focused on strategic recommendations and case studies for training creative talents and supporting startups within the ArtTech ecosystem in Lithuania. The chapter highlighted the critical role that creative talents and startups play in driving innovation, economic growth, and cultural influence in CCIs. Through a comparative analysis, it was shown that Korea, with its well-established programs under KOCCA, has successfully fostered a vibrant ecosystem by providing structured support for creative talents and startups through initiatives like the Creative Talent Partnership Program and Content One Campus. In contrast, while Lithuania has shown promising growth in its new creative industries, it faces challenges such as regional disparities, insufficient support systems dedicated to ArtTech, and limited investment in R&D. To overcome these challenges, it is recommended that Lithuania develop a more cohesive strategy for nurturing creative talents and supporting startups. This could include establishing dedicated funding schemes, creating institutions similar to KOCCA, and fostering stronger collaboration between academia, industry, and government. By implementing these strategies, Lithuania can enhance its ArtTech ecosystem, increase global competitiveness, and drive sustainable growth in the CCIs.

To fully realize the potential of Lithuania's ArtTech sector, it is essential for the country to take a proactive and strategic approach. By implementing the recommendations outlined in this report—such as investing in R&D, establishing dedicated support systems for startups, fostering public-private partnerships, and enhancing the education and training of creative talents—Lithuania can build a robust and innovative ArtTech ecosystem. These efforts will enhance Lithuania's global competitiveness and drive sustainable economic growth and cultural development.

Moving forward, it is crucial for Lithuania to remain committed to continuous evaluation, adaptation, and collaboration to ensure the long-term success and vitality of its ArtTech sector. Through these dedicated efforts, Lithuania can establish itself as a leader in ArtTech innovation, benefiting both its economy and society at large.

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The KSP is a policy-oriented development cooperation program designed to share Korea's development experience and knowledge. Its goal is to support the institutional and capacity building of partner countries through collaborative research, policy consultations, and technical assistance on key policy issues.

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