Full Report

Arts and Technologies in ASEAN

Interconnected Parts

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Foreword

The British Council has been facilitating global collaboration in shaping and enjoying a creative and prosperous future through art and culture. For more than ten years, its Creative Economy programme has been playing a crucial role linking ideas and expertise from the UK with creative communities worldwide. It aims to establish new links, create networks, and promote knowledge sharing to increase trust and understanding across borders (Apostol and Harahap, 2021).

The British Council, being the UK's international organisation for cultural relations and educational opportunities, connects ideas and people from the UK with the world. It builds networks and supports collaboration for long-term impact, mutual benefit, and greater understanding. It engages policymakers at a strategic level, ensuring the conditions are in place for creative individuals and organisations to grow, reach their potential and effect relevant, sustainable change. Previously the regional programme, Creative Hubs for Good which ran from 2018 – 2022, supported creative hubs as key drivers and catalysts for good in cities in Southeast Asia. In 2021, British Council also collaborated with ASEAN Secretariat, ADB Institute and ICRIER to produce Creative Economy 2030: Imagining and Delivering a Robust, Creative, Inclusive and Sustainable Recovery – publication and policy dialogue.

In August 2021, the UK was granted Dialogue Partner status to ASEAN. This promises new pathways to bridge knowledge gaps, enable innovation, and build a robust foundation for sustainable growth in the region. The ASEAN-UK Plan of Action underscores cooperation in various areas, including cultural exchanges and the promotion of creative entrepreneurship. As an effort to support the ASEAN-UK Plan of Action, in early 2024 British Council established the ASEAN-UK Advancing Creative Economy initiative, co-funded by the UK's Foreign Commonwealth Development Office and with support from the ASEAN Secretariat. The programme aims to promote cultural exchange and socio-economic growth in the ASEAN region by maximising the potential of creative economy on individuals, communities and the environment. At the heart of our programme is a commitment to empowering creative professionals and policymakers, fostering collaboration, and facilitating knowledge exchanges between the UK and ASEAN.

Strengthening ties between ASEAN and the UK, guided by principles on transparency and inclusion, can greatly contribute to the region's digital development and the establishment of a vibrant creative economy, with the British Council acting as 'a much-valued facilitator and enabler, connecting talent locally and with the UK, giving visibility and voice and thus acting as a go-to partner for information, access to networks and connections to the UK' (TFCC 2019).

We wish to extend our thanks and appreciation to our partners, the UK Mission to ASEAN and ASEAN Secretariat for their support, the creative technology practitioners in Southeast Asia who showed eagerness and generosity to provide input to this research. Lastly, we are grateful for the hard work and dedication of the brilliant team at Creative Friction Ltd who carried out this research with enthusiasm and tenacity.

Executive summary

The arts and technologies ecosystem in the Association of Southeast Asian Nations (ASEAN) is shaped by tradition, modernity, and a drive for prosperity. It has evolved significantly over the past decade, as marked by the expansion of social media platforms, immersive experiences and artificial intelligence. The Covid-19 pandemic accelerated a shift to hybrid and digital-first approaches in the arts, with a focus on upskilling and new livelihood opportunities for creative professionals. Artists are pushing practices by using technologies in lighting, 3D, sensors, sound production and others.

Arts and Technologies in ASEAN: Interconnected Parts takes a closer look at 10 ASEAN member states and Timor-Leste by investigating how these intersections are leading to new practices and trends. The British Council has commissioned Creative Friction Ltd. to learn more and map these developments. Through in-depth case studies and over 60 interviews with artists, technologists, policymakers and academics, the report reveals a highly diverse region at the forefront of exciting ideas and experimentation. The study is unique as it examines developments from an artist-led perspective rather than a purely economic lens.

Key findings

ASEAN's arts and technologies are driven by artist-led innovations that enhance tradition and establish new paradigms of artistic expression. Artists are advancing fields like fashion, new media, animation and music, setting new standards for creativity, research and development, and global engagement.

Interdisciplinarity has blurred boundaries between traditional art forms, new media, and technology. Initiatives often bring together art, science, and community engagement. Practices highlight and put into question the evolving role of artists, who are increasingly becoming researchers, innovators, coders, and entrepreneurs. But more importantly, this evolution highlights the capacity of artists as connectors of knowledge and life-long learners.

The socio-political landscape greatly informs creative expression. Artists are exploring themes around healing, climate resilience, and socio-political dialogue, redefining what it means to be innovative. For example, artists in Myanmar use VR and the metaverse for activism, while in Cambodia, new media explores cultural memory and urban development. In Thailand, art-science collaborations showcase how creative technologies can drive ecological awareness.

Technology has become a bridge to explore fundamental questions around humanity. Through immersive technologies, artists in ASEAN are creating entire worlds that simulate human interactions. Spirituality emerges as an unexpected yet profound theme with practices seeking to shape artistic expression, and reflect the interconnectedness of life, belief systems, and the natural world. This raises profound questions about how we interact, learn and consume in today's world.

ASEAN is a dynamic ecosystem that involves governments, educational institutions, startups, spaces, artists and civil society. Public support and educational programmes, though varying by country, drive digital transformation in the creative industries. Startups and creative hubs foster entrepreneurship and public engagement, while international organisations and NGOs support contexts with limited resources.

Technology has transformed creative jobs and artistic practices. Design processes like research, prototyping, and ideation allow artists to become more competitive. While highly creative tasks are still highly valued, AI automation is displacing repetitive roles and creating job insecurity.

The arrival of generative AI (GenAI) is a double-edged sword. Advanced AI models and tools remain largely proprietary and paying, limiting artists to content generation rather than higher-level innovation. Practitioners navigate this context by using technology selectively and ensuring it enhances rather than overshadows creativity. But this underscores a broader trend: despite technological advancements, ASEAN artists still view creativity as a fundamentally human, analogue endeavour.

Big technology companies impact accessibility, especially for developing countries. This has created dependencies through restrictive licensing, high fees and potential barriers to entry for smaller or independent creators. While open-source platforms offer flexibility, they often lack the resources and stability provided by big tech, creating barriers for smaller creators. Adobe Creative Cloud, for instance, generated over USD 11.5 billion in 2023, with Photoshop being used by over 90% of creative professionals.

Intellectual property (IP) support is critical. It protects content and innovation, attracts investment and ensures fair compensation for creators. International regulations promote innovation and safeguard rights. However, support varies across ASEAN, with countries like Singapore and Malaysia having robust IP systems, while others like Lao PDR and Myanmar are still in early stages.

The digital divide remains. This is due to various factors, including insufficient funding, political instability and economic uncertainty. Women, ethnic minorities, low-income students and other marginalised groups face significant barriers to technology access and higher education. Fragmented ecosystems across ASEAN complicate regional collaboration and lead to missed opportunities.

Promoting more coordinated exchanges, harmonised policies, and strategic investments is crucial.

Fostering digital literacy and skills development, particularly among women and marginalised groups, is key to bridging the digital divide. Expanding support for interdisciplinary activities, such as through creative hubs and incubators, will nurture talent and drive innovative solutions.

The United Kingdom (UK) is already playing a significant role in the region through policies and agreements that encourage international cooperation and cross-sectoral collaboration. The British Council, working with ASEAN stakeholders, can play a pivotal role through leveraging networks, funding and sector expertise. By encouraging arts-led innovations, the region has a unique opportunity to unlock new narratives, inclusive prosperity and achieve global impact.

List of abbreviations

3D	Three Dimensional
AAI	Applied Artificial Intelligence
ABC	Australian Broadcasting Corporation
ADB	Asian Development Bank
AHRC	Arts and Humanities Research Council
AI	Artificial Intelligence
AITI	Authority for Info-communications Technology Industry
APRA	Australasian Performing Right Association
AR	Augmented Reality
ASEAN	Association of Southeast Asian Nations
AWEN	ASEAN Women Entrepreneurs Network
BAHTC	Brunei Authority for Technology and Cultural Heritage
BIL	Brunei Innovation Lab
BND	Brunei Dollar
BRUIPO	Intellectual Property Brunei Darussalam
CAGR	Compound Annual Growth Rate
CECP	Creative Economy Council of the Philippines
CIC	Creative Industries Council
CMO	Collective Management Organizations
CSPS	Centre for Strategic and Policy Studies
DARe	Darussalam Enterprise
DDCMS	Department for Digital Culture Media and Sport
DEFA	Digital Economy Framework Agreement
DEP	Digital Economy Policy
DICT	Department of Information and Communications Technology
DMX	Digital Multiplex
DTI	Department of Trade and Industry
EEG	Electroencephalogram
FCDO	Foreign, Commonwealth & Development Office
FDI	Foreign Direct Investment
GenAI	Generative Artificial Intelligence
GDP	Gross Domestic Product
GIS	Geographic Information System
ICT	Information and Communication Technology
IMDA	Infocomm Media Development Authority

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IMF	International Monetary Fund
IP	Intellectual Property
IPOPHL	Intellectual Property Office of the Philippines
IPOS	Intellectual Property Office of Singapore
IoT	Internet of Things
LGU	Local Government Units
LLM	Language Learning Model
MDEC	Malaysia Digital Economy Corporation
MOE	Ministry of Education
MOFE	Ministry of Finance and Economy
MPEC	Manpower Planning and Employment Council
MR	Mixed Reality
NAC	National Arts Council
NFT	Non-Fungible Token
NLP	Natural Language Processing
NUAC	National University of Art and Culture
O&G	Oil and Gas
PDPA	Personal Data Protection Act
R&D	Research and Development
RCA	Royal College of Art
RCEP	Regional Comprehensive Economic Partnership
SDS	School of Digital Science
SIKAP	Creative Content Creators Association of the Philippines
SME	Small and Medium-sized Enterprises
SOCA	School of Contemporary Arts
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UBD	Universiti Brunei Darussalam
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTB	Universiti Teknologi Brunei
VR	Virtual Reality
Watershed	Leading Centre for Digital Creativity
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
XR	Extended Reality

Introduction

Background and context

In 2022, Watershed, the UK's pioneering media centre, published a troubling article outlining how society's relationship with technology has been changing over the past decades. The organisation was founded 40 years ago in Bristol with the belief that collaboration between artists and technologists could help shape a better future. Technology has since become a significant global force, with nine out of the ten largest public companies in the world coming from the tech sector. However, this growth has also led to inequality, exclusion and exploitation. Watershed called for a need to examine how creative technology can contribute to a future that is inclusive, sustainable and playful (O'Leary, 2022).

Throughout history, the synergy between art and technology has consistently impacted practices, trends, and policy. It has given rise to new forms of media and business models. The invention of the printing press in the 19th century, and more recently, e-publishing, completely transformed the production and distribution of literary works (Sacco, 2011). New media technologies, e-commerce and GenAI have expanded the visual arts from traditional paintings to contemporary forms of digital installations and non-fungible tokens (NFTs).

In the context of this report and the British Council's portfolio, the term 'arts and technologies' refers to the broad intersection between the arts, cultural, and creative industries and technological innovation. It is often used interchangeably with 'creative technology', a term used by UK accelerator Digital Catapult, to describe technologies that enable the creative industries to produce new experiences services,products, and other forms of cultural activity. The Creative Industries Council describes creative technology as 'new tech that seeks to improve and automate the delivery and use of creative services' (Tech Nation, 2021). University of Salford's Creative Technologies Research Centre 'explore[s] the intersections between creative practice and emergent technology innovations.'
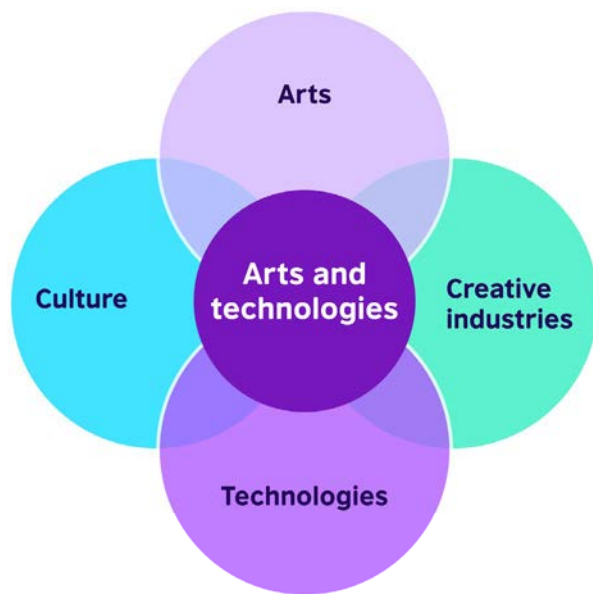
Recent studies have focused more on technology as the primary driver of innovation and growth, often through the point of view of start-ups and small and medium-sized enterprises or SMEs (ZCCE, 2024). However, the significant influence of the arts, cultural, and creative industries as drivers of technological innovation is often overlooked which is why the term 'arts and technologies is prioritised in this report. The report addresses this imbalance by examining innovation from an arts-led

perspective. It will evidence, through diverse case studies, that the arts, cultural, and creative industries have the ability to inspire and drive technological advancement, push for inclusion, and encourage meaningful user engagement with emergent technologies.

Thus, the report, **Arts and Technologies in ASEAN: Interconnected Parts**, articulates the reciprocal relationship between the arts, cultural, and creative industries with advancing technology. By exploring and understanding innovation at this dynamic intersection, the study uncovers the impact of technologies in the hands of artists and creatives both within and beyond arts.

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Key findings reveal that artists are driving new paradigms of creativity by integrating traditional practices with emerging technologies. The arts and technologies ecosystem is dynamic, relying on collaboration between governments, educational institutions, startups, and civil society. Additionally, the blurring of boundaries between art, science, and technology is leading to new forms of artistic expression and innovation. These findings set the stage for a detailed analysis of initiatives that can be effectively supported through policy, investment, and international collaboration.

Meanwhile, the arts and technologies ecosystem in Southeast Asia is also undergoing changes. This rapid growth has led to new means of accessing cultural content, working and doing business. Design, new media and digital content are just some of the biggest sectors (UNCTAD, 2018). The optimistic outlook has driven governments across the region to take advantage of this pivotal point in their creative economy development and digital transformation journey.

The ASEAN Digital Economy Framework Agreement (DEFA), launched in 2021 as a strategic initiative, aims to foster a unified digital economy across member states. With a goal to unlock US$2 trillion in economic value by 2030, its primary objectives include enhancing digital connectivity, promoting e-commerce, and encouraging the adoption of digital technologies across various sectors. The DEFA seeks to streamline regulations, facilitate cross-border data flows, and strengthen cybersecurity measures to create a more integrated and competitive digital marketplace. DEFA's implementation could lead to significant advancements in creative technology by enabling greater access to digital tools, expanding market reach, and fostering innovation.

As the ASEAN region embraces digitalisation, there is a growing need to foster collaboration, promote equitable growth and scale the creative industries in a sustainable way. However, many challenges persist. The lack of digital skills, regulatory policies and their enforcement (e.g. IP), and digital infrastructure are just some of them. In order for organisations like the British Council to respond to this context and support creative communities in a significant way, there is a need to better understand how the creative technology ecosystem is evolving in the region.

The research aligns with the British Council's wider project objectives to:

- Build network capacity for creative practitioners in the 10 ASEAN Member States (AMS) and Timor-Leste by mapping the arts and creative technology ecosystem and key players

- Document and present the range of trends, gaps, opportunities and challenges faced by the arts and creative technology ecosystem

- Provide a way of looking at the relation and intersection between the creative economy, digital economy, science, technology, arts and innovation.

- Document existing connections between arts and creative technology organisations in ASEAN member states and in the UK and to open a discourse on future shared challenges and opportunities

With this context in mind, the research aims to answer three key questions:

1. What are the key characteristics of the creative technology ecosystem in ASEAN, and how have these intersections evolved over the past decade? How are creative practitioners adopting, adapting, questioning, and transforming GenAI since 2020?

2. How do in-depth case studies demonstrate the role of art and creative practice in driving innovation and shaping perceptions of technology?

3. What does the ecosystem of each country look like and how can it be effectively supported and enhanced through policy, investment, networking, and international exchange?

The term 'innovation' encompasses a variety of definitions and perspectives. Borshalina (2019) presents it as involving the strategic implementation of new ideas and technologies to enhance creative processes and outputs, often leading to new products, services, or practices that improve existing ones.

Carayannis and Campbell (2009) define it as a process of knowledge creation and diffusion that involves collaborative networks among universities, industries, and governments. They emphasise the importance of systemic interactions in driving creativity and technological advancements. Expanding on this, they introduce the Quadruple Helix model, which incorporates civil society as a fourth dimension alongside academia, industry, and government. This model highlights the role of public engagement and societal needs in the innovation process, suggesting that innovation thrives through the collaborative efforts of these four sectors, creating a dynamic ecosystem conducive to holistic growth and development.

Cunningham et al. (2003) refer to innovation as areas where the production of creative, digital content, and applications thrive, emphasising the role of research and development (R&D) and collaboration among key stakeholders to generate solutions that cater to evolving market demands.

In this context, an 'ecosystem' is defined as a network of interconnected parts, including businesses, academic institutions, governmental bodies, and other stakeholders, that collaborate and interact in a mutually beneficial manner to drive innovation and growth in the creative technology sector (Autio & Thomas, 2014). This concept emphasises the importance of fostering a supportive environment where resources, knowledge, and capabilities are shared to stimulate creativity and technological development.

As such, the report refers to the perspectives above to provide a broad understanding of what qualifies as innovative. It considers how the interconnected parts of an ecosystem are interacting with one another – from products, processes and infrastructure, and others – in order for innovation to take place. The report then evaluates how ecosystems can best support the development of novel, creative technologies.

Throughout the report, we mention the 'arts', 'cultural sector', and 'creative industries' and distinguish each one based on practices on the ground within the ASEAN context. The arts typically involve individual or collective expressions through

various mediums such as painting, sculpture, music, and theatre, with stakeholders including artists, galleries, and arts education institutions (Yue, 2016). The cultural sector encompasses broader societal values, traditions, and heritage, involving stakeholders such as museums, cultural heritage organisations, and government cultural agencies (UNESCO, 2015). The creative industries merge creative outputs with more entrepreneurial objectives, covering areas like design and digital content, and include startups, SMEs, media companies, and industry regulators (Hartley et al., 2013). While these stakeholder groups often crossover, each one has distinct perspectives, with the arts often focusing on aesthetic and expressive values, the cultural sector emphasising preservation and cultural identity, and the creative industries prioritising innovation, market dynamics, and economic growth (Flew, 2017).

While Southeast Asia is the technical name for the geographic region, ASEAN (Association of Southeast Asian Nations) is the political and economic organisation consisting of ten member states, with Timor-Leste in the process of becoming the 11th member. For the sake of a consistent term usage with other British Council reports, the study uses ASEAN and Southeast Asia interchangeably.

The study's geographic scope includes case studies from 11 countries, namely: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam.

The report is primarily designed to inform British Council programme teams and partners. However, it will also be a useful resource for practitioners and organisations looking to better understand the creative technology ecosystem in the ASEAN region. It aims to provide insights into how technology and the arts intersect, offering valuable information for those exploring partnership and collaboration opportunities. Policymakers can benefit by gaining a holistic view of the needs and challenges of relevant stakeholders and how policy can contribute to an innovative sustainable and transformative creative ecosystem. Lastly, the study provides new data and analysis to researchers within the evolving field of arts and technologies.

The geographical map of the ASEAN region, and Timor-Leste

ASEAN overview

The ASEAN was established on 8 August 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The bloc has since expanded to include Brunei Darussalam, Vietnam, Lao PDR, Myanmar, and Cambodia. ASEAN's primary aims are to accelerate economic growth, social progress, and cultural development while promoting regional peace and stability and offering a platform for member states to discuss differences peacefully (ASEAN, 2015).

ASEAN operates on the principles of mutual respect for the independence, sovereignty, equality, territorial integrity, and national identity of all nations. This principle of non-interference in internal affairs has fostered a cooperative yet cautious approach to regional integration. These principles are enshrined in the ASEAN Charter, which serves as the legal and institutional framework for the organisation (ASEAN, 2015).

ASEAN's strategic importance is underscored by its geographic location at the crossroads of major global trade routes, notably the South China Sea.

The South China Sea is one of the world's most important waterways, with more than $3.4 trillion worth of trade passing through annually (Schrag, 2017). This has led to overlapping territorial claims among several ASEAN member states and China, posing significant geopolitical challenges. The region's stability is crucial for global trade, making ASEAN a key player in international diplomacy and economic negotiations.

ASEAN's commitment to economic integration is reflected in initiatives like the ASEAN Economic Community (AEC), which aims to create a single market and production base. The AEC Blueprint 2025 outlines strategies to enhance connectivity, competitiveness, and inclusivity across member states (ASEAN, 2015). Despite the challenges posed by differing levels of economic development, regulatory frameworks, and political systems, ASEAN remains focused on deepening economic integration.

ASEAN's external relations are pivotal for its economic and political stability. The bloc has established strategic partnerships with key global players, including China, the United States, Japan, and the European Union. These partnerships are

essential for regional security, economic cooperation, and addressing transnational issues such as climate change, cybersecurity, and public health crises . For instance, the ASEAN-China Free Trade Area (ACFTA), established in 2010, has significantly boosted trade between ASEAN countries and China, highlighting the economic interdependence within the region (ASEAN, 2015).

Despite these strengths, ASEAN faces several challenges. The principle of consensus-based decision-making can slow down responses to regional crises and impede the implementation of ambitious reforms. Additionally, varying levels of economic development and political systems among member states complicate deeper integration efforts. The Rohingya crisis in Myanmar is a stark example where ASEAN's non-interference principle has been criticised for delaying effective collective action (Khatu, 2019).

Demographics

ASEAN's population is approximately 671 million as of 2022, making it the third-largest population bloc in the world, after China and India (ASEAN Statistical Yearbook, 2023). The region's median age is around 30 years, indicating a young and dynamic demographic profile (ESCAP, 2023). This demographic dividend can drive economic growth and innovation if adequately harnessed through investment in education, healthcare, and employment opportunities

Urbanisation rates vary significantly across ASEAN countries. According to World Bank data (World Bank, 2023a), Singapore has an urbanisation rate of 100%, while Brunei Darussalam's urbanisation rate is 78.8%. In contrast, Cambodia has a much lower urbanisation rate of 25.2%, with a substantial portion of its population residing in rural areas. Lao PDR also has a relatively low urbanisation rate of 37.9% .

This urban-rural divide presents challenges in terms of equitable access to services, including

healthcare, education, and digital infrastructure. The ASEAN Sustainable Urbanisation Report (UN-Habitat, 2022) highlights the diversity of urban development within the region, from well-established megacities to emerging urban areas that until recently have been largely rural and agricultural settlements, requiring a variety of urban management solutions.

The region's economic diversity is stark. ASEAN includes both high-income countries like Singapore and emerging economies such as Cambodia and Myanmar. According to the World Bank data, Singapore's GDP per capita for 2023 was $84,734 (World Bank, 2023b). In contrast, Cambodia's GDP per capita for 2023 was $1,875 (World Bank, 2023c), while Myanmar's GDP per capita for 2023 stood at $1,187 (World Bank, 2023d). These figures highlight the significant economic disparities within the ASEAN region, with Singapore's GDP per capita being over 71 times that of Myanmar's and about 45 times that of Cambodia's.

Such disparities necessitate tailored economic and policy approaches to ensure inclusive growth across the region. For instance, while Singapore focuses on advanced industries and high-tech services as part of its Singapore Economy 2030 vision (Ministry of Trade and Industry Singapore, 2023), Cambodia has increased its investment in education to more than $800 million in 2023 to improve the quality of education and spur economic development (Khmer Times, 2023).

ASEAN's young population represents a significant opportunity for economic growth. However, this also poses challenges in terms of providing adequate education and employment opportunities. The region's youth unemployment rates vary considerably. For example, Indonesia's youth unemployment rate was around 13.94% in 2023 (Statista, 2023), while Cambodia's was notably lower at 0.72% in the same year (The Global Economy, 2023).

Navigating the digital divide

Despite the context of ASEAN's growing digital economy and the rapid adoption of advanced technologies, the digital divide remains a significant barrier to the arts and creative technology sectors. This multifaceted divide impacts economic growth, social inclusion, and regional integration across ASEAN member states (*ASEAN Digital Integration Index Report, 2021)*. Addressing this divide is crucial for fostering a vibrant creative technology ecosystem across the region.

The first digital divide in ASEAN centres around reliable internet access and affordable devices.

While internet penetration has grown significantly, there are stark disparities between countries. Although 70% of ASEAN's population are internet users, the region still needs to improve digital access and literacy and upgrade people's skills *(SEADS, 2024)*. Internet penetration across ASEAN countries varies widely, from as high as 73% of the population in Singapore to little more than 1% in Myanmar (Internet Society, 2015).

Socioeconomic conditions play a crucial role in the digital divide, with economic growth and level of urbanisation identified as key determinants (UNICEF, 2020). Geospatial challenges are evident in the notable difference in digital literacy between rural and urban respondents, with rural areas lagging behind their urban counterparts (ABI Research, 2023).

Even where connectivity exists, many ASEAN citizens lack the skills to use digital technologies effectively - this represents the second digital divide.

Digital literacy levels vary widely across the region, with Singapore at the forefront and countries like Cambodia struggling. Many ASEAN countries struggle with low levels of digital literacy, particularly in rural regions. This impedes the adoption and effective use of digital technologies. Educational systems in countries like Cambodia and Lao PDR are underfunded and often fail to provide adequate training in digital skills (UNESCO, 2022).

There is a significant urban-rural divide in digital skills within countries. These challenges are particularly pronounced in countries such as Myanmar, Lao PDR, and Cambodia, which lag behind in various digitalisation indicators (UNESCO, 2022; World Bank, 2024). The urban-rural digital divide remains a significant barrier, with rural areas often lacking the necessary infrastructure for high-speed internet, thus limiting access to digital services and opportunities. For instance, only 55% of villages in Lao PDR are covered by 4G networks (World Bank, 2024). Similarly, Cambodia's internet penetration stood at 56.7%, reflecting similar challenges (World Bank, 2024).

Many users in the region primarily access the internet through social media apps, limiting their engagement with the broader digital economy (Chiang, 2023). The ASEAN Digital Integration Index (ADII) identifies Digital Skills & Talent as the lowest-scoring pillar, highlighting an urgent need to promote science, technology, engineering, and mathematics (STEM) education and digital skills development *(ASEAN Digital Integration Index Report, 2021)*.

The third digital divide concerns the ability to leverage digital technologies for personal and professional growth.

The benefits of the digital economy are concentrated in certain sectors and metropolitan areas. Women and smaller businesses often lag in terms of entrepreneurship opportunities and digital technology adoption. There's uneven development of regulatory frameworks across ASEAN countries, affecting the distribution of digital economy benefits *(ASEAN Digital Integration Index Report, 2021).*

The digital divide in ASEAN is rooted in various factors, including socioeconomic conditions, geospatial challenges, demographic factors such as gender, age, and education levels, and varying stages of economic development and digital infrastructure investment across member states. These divides significantly impact the arts and creative technology sectors by limiting market access for artists and creatives in less digitally advanced areas, leading to uneven innovation potential and reduced collaboration opportunities within the creative community.

ASEAN and its member states are taking steps to bridge these divides. The ASEAN Digital Masterplan 2025 and the Master Plan on ASEAN Connectivity 2025 guide digital cooperation among member states *(ASEAN Digital Integration Index Report, 2021).* Initiatives like Go Digital ASEAN aim to broaden digital skills participation across the 11 countries (Rieger, 2020).

By addressing these areas, ASEAN can work towards narrowing the digital divide and ensuring that the benefits of digital transformation are more equitably distributed across the region. This approach is crucial for ASEAN to realise its potential as a leading digital economy and community, estimated to reach $1 trillion by 2030 (Chiang, 2023).

The arts and technologies ecosystem

The ecosystem in ASEAN is an emerging field that combines traditional creative arts with modern digital technologies, spanning industries such as digital media, animation, gaming, extended reality (XR), artificial intelligence (AI) and creative software development. This sector holds significant potential to transform economies, foster innovation, and promote cultural expression across the region.

Growth and potential

ASEAN's digital economy is projected to grow at a compound annual growth rate (CAGR) of 6%, potentially reaching USD 1 trillion by 2030 (Google, Temasek, Bain & Company, 2023). This growth is driven by increasing internet penetration, a youthful and tech-savvy population, and supportive government policies. Countries such as Singapore and Malaysia excel in digital integration, with initiatives like Singapore's Smart Nation and Malaysia's Digital Economy Blueprint emphasising the importance of digital transformation across various sectors, including the creative industries (Infocomm Media Development Authority, 2023; MDEC, 2023).

The UK ecosystem

The UK's arts and technologies ecosystem is a dynamic and economically significant sector, characterised by diversity, innovation, and global influence. As of 2021, the creative industries contributed £115.9 billion ($150.67 billion) to the UK economy, reflecting a growth rate faster than the overall economy (DDCMS, 2022). A key characteristic of its creative tech sector is its pioneering legacy and heritage, which dates back to early innovations in film, television, and digital media.

Organisations like Watershed, a leading centre for digital creativity in Bristol, have been at the forefront of this landscape, fostering collaboration between artists, technologists, and academics. Today, it remains a vital hub for innovation, offering a platform for interdisciplinary projects and nurturing the next generation of creative talent (Watershed, 2023).

FutureEverything, a Manchester-based innovation lab and cultural organisation, exemplifies the fusion of creativity and technology. Since its inception in 1995, FutureEverything has been at the forefront of exploring digital culture, hosting annual festivals that bring together artists, technologists, and researchers to collaborate and innovate. The organisation's projects span art, technology, and society, highlighting the transformative potential of digital innovation in the creative sector (FutureEverything, 2023).

The UK is renowned for its robust research and development (R&D) capabilities, with many institutions specialising in creative technology through interdisciplinary programmes and cutting-edge research centres. Higher education institutions like the University of the Arts London's Creative Computing Institute expand boundaries through combining creative practices with computer science.

There is a strong push for Intellectual Property commercialisation and entrepreneurship with initiatives like the Royal College of Art's Innovation (RCA) and the University of the Arts London's Creative Enterprise Zone, which provide resources and incubation support to turn creative ideas into successful businesses. The country's strength in R&D is further supported by government initiatives and funding programmes aimed at driving innovation in the creative industries.

The Department for Digital, Culture, Media and Sport (DDCMS) plays a significant role in the creative technology ecosystem by shaping policies and providing funding that supports the growth and sustainability of the sector. In fact, the addition of "Digital" to the Department for Culture, Media and Sport (DCMS) in 2017 underscored the importance of digital technology in modern cultural and creative industries, highlighting the country's commitment to digital transformation and innovation (DDCMS, 2017).

The Arts and Humanities Research Council (AHRC) is another key agency promoting intersections between arts and creative technology. The AHRC funds research projects that explore the fusion of digital technology with the arts and humanities, fostering innovation and new forms of artistic expression. Through initiatives like the Creative Industries Clusters Programme, AHRC supports collaboration between universities and businesses to drive economic growth and enhance the UK's global creative reputation (AHRC, 2023).

Innovate UK, part of UK Research and Innovation (UKRI) plays a crucial role by providing grants and support for tech-driven creative projects. Innovate UK's funding helps startups and established companies develop cutting-edge technologies and bring them to market, thereby stimulating the creative economy (Innovate UK, 2023).

The UK is home to some of the world's most pioneering game companies. Studios such as Rockstar North, known for the globally influential "Grand Theft Auto" series, and Media Molecule, creators of the innovative "LittleBigPlanet" and "Dreams," have pushed the boundaries of interactive entertainment. Another notable example is Ninja Theory, recognized for its work, 'Hellblade: Senua's Sacrifice,' which integrates cutting-edge technology with deep narrative and mental health awareness, showcasing the potential of video games as powerful storytelling mediums (Rockstar Games, 2023; Media Molecule, 2023; Ninja Theory, 2023).

Individual artists are also leveraging creative technology to address societal issues and push the boundaries of traditional art forms. For example, Alexandra Daisy Ginsberg (2024) is algorithmically generating living sculptures for pollinator insects that call into question anthropocentric design biases. Similarly, Jake Elwes (2023) is exposing the underrepresentation of queer communities in AI through deep fake drag cabarets. Both artists exemplify how creative technology can be used to provoke thought and inspire change.

Several immersive and creative technologies developed in the UK have had a global impact, enhancing how artists create and share their work worldwide. For example, the development of Virtual Reality (VR) and Augmented Reality (AR) technologies by companies like Improbable and Blippar has revolutionised how artists create immersive experiences. Improbable's SpatialOS platform allows for the creation of vast, interactive virtual worlds, which artists and developers use to build immersive games and simulations that offer new forms of storytelling and interaction (Improbable, 2023).

Framestore, another company, has pioneered visual effects and VR/AR technologies used in blockbuster films and immersive experiences. Their innovative work includes creating realistic digital characters and environments, which have been utilised in films like 'Gravity' and 'Avengers: Endgame,' as well as VR experiences for theme parks and exhibitions (Framestore, 2023).

Recent developments include the increasing role of digital platforms in art distribution, the growth of the gaming and interactive media sectors, and a significant focus on sustainability and social impact within creative practices (Nesta, 2021). These elements collectively position the UK as a hub and partner for creative and technological innovation on the global stage, and promise exciting opportunities for collaboration and exchange.

Methodology

Research design

This qualitative research is designed to balance comprehensive exploration with manageable scope, ensuring that we capture the diverse realities of each country while providing valuable insights. To this end, we have developed specific research questions that are structured around **five key research design dimensions**: intersections, coordination, practices, technology, and trends. These dimensions cross-over and interact through **ecosystem dynamics**, which we have meticulously explored within the localised contexts of each ASEAN country.

The **first** dimension, **intersections**, focuses on identifying the key players, projects, spaces, and domains where creative practices and technology intersect – or come into direct contact – in ASEAN countries. This includes examining the notable actors and innovative projects that bring together creative practice and technology in a generative way. The **second** dimension, **coordination**, looks at the policies, infrastructures, and resource dynamics that influence the development of creative technology. This involves understanding how various factors support or constrain the growth of creative technology sectors in each country. The **third** dimension, **practices**, explores the specific arts and creative practices that are driving the development of creative technology in the ASEAN region. This includes examining the innovative methods and processes that are shaping the creative technology ecosystem. The **fourth** dimension, **technologies**, investigates how creative practitioners perceive technology and the various sites where art and technology intersect. This helps in understanding the broader context in which creative technology operates. The **final** dimension, trends, focuses on identifying the latest and emerging trends at the intersection of artificial intelligence (AI), art, and innovation in ASEAN countries. This includes exploring how new developments are influencing the ecosystem and what future directions might be emerging.
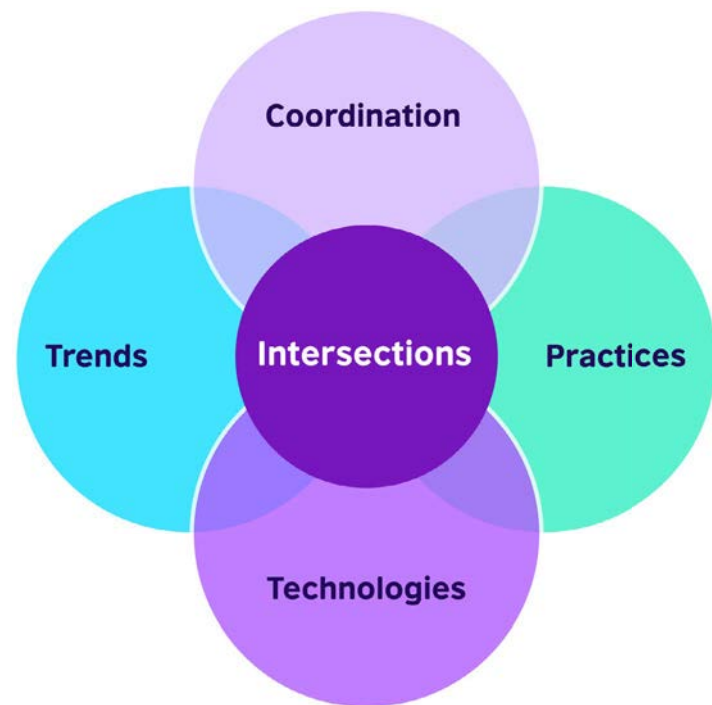
The five key research design dimensions

Research strategy

Considering the wide geographic scope of the project and time and resource constraints, our research strategy focused on an "inside-out" nested case research method. It is mostly based on detailed case studies within an ASEAN country. The aim is to capture the essence of how arts and creative practices intersect with technology in localised settings. After gathering this granular data, the research expands to examine other dimensions, including policies, infrastructure, and broader practices that influence ecosystems. Finally, the strategy incorporates cross-country comparisons within ASEAN and an international perspective, contextualising results within global trends and cross-cultural exchanges.

While this approach allows us to capture rich, primary data, it inherently limits the scope to specific areas of interest, which may not fully represent the entirety of each country's ecosystem. To mitigate this, the case studies are complemented by desk research, which broadens the context and provides additional perspectives. As a result, the findings provide a deep, yet partial, understanding of the creative technology landscape across the 11 Southeast Asian countries. This selective focus is a necessary trade-off that enables us to explore in-depth data while acknowledging that some aspects of the broader ecosystem may remain under-explored.

Data collection methods include both desk research and semi-structured interviews. Desk research involved reviewing existing literature, policy documents, and media articles related to the intersections and case studies.

In consultation with local experts and researchers, we selected case studies using criteria such as innovation and technology integration, creative and cultural impact, community and network dynamics, policy and regulatory environment, infrastructure and resources, cultural and social relevance, economic impact, and emerging trends. The case studies were further refined based on their focus on artist-led innovation and broader creative technology initiatives, considering factors such as sustainability, replicability, and inclusivity.

Semi-structured interviews were conducted with four key stakeholders per country, including artists, policymakers, technology experts, and academics. The interviews were conducted online and lasted for about an hour and a half on average. In cases where the interview was conducted in the local language, such as, Vietnamese or Indonesian, translation was provided by our local researchers to ensure transparency and comprehension across the team. We also ensured that the voices of minority groups were included and considered the gender balance of respondents. Over 60 interviews with artists, technologists, policymakers and academics were conducted.

A detailed explanation of the **Methodology** is found in Appendix A.

Dynamic mapping

This chapter analyses the ecosystems of 11 countries through dynamic mapping. Informed by desk research and in-depth case studies, it focuses on the intersections of trends, practices, policy coordination, and technologies on a regional level. It includes discussions on creative technology evolution, key characteristics, stakeholder analysis, and other factors shaping the ecosystem. It then examines the different factors driving or stifling innovation in ASEAN, such as global collaboration and the digital divide.

Detailed findings for the 11 countries can be found as a separate file, Appendix B: Country deep dives.

A comprehensive overview of relevant policies is found in another separate file, Appendix C: Policy frameworks.

Ecosystem dynamics – A summary

Ecosystem dynamics refer to the interactions between the different dimensions of the ecosystem. These interconnected parts are what give character, energy and colour to the region.

ASEAN countries have their own unique strengths and focus areas. Singapore and the Philippines, for example, are at the forefront of new media and digital content development, while countries like Brunei Darussalam and Timor-Leste are making strides to integrate technology with traditional arts. Across the board, GenAI is fast becoming a tool transforming creative practices. Despite challenges related to infrastructure and access, the region is driven to become a growing force in the global creative economy.
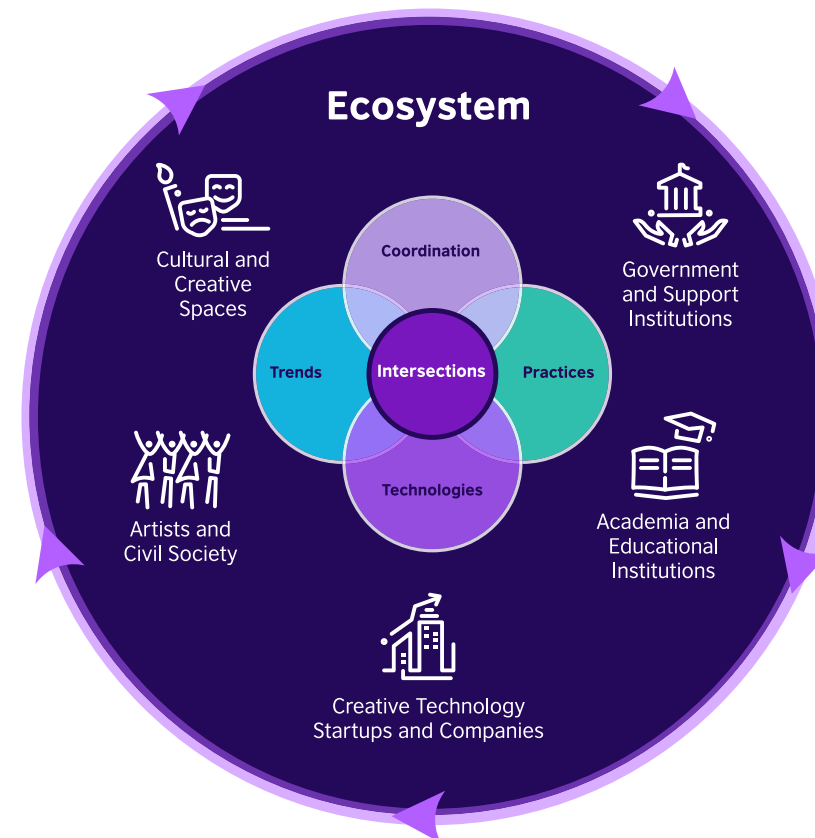
Ecosystem dynamics: Shaped by stakeholders and the many ways that trends, technologies, practices, and policy coordination are intersecting.

| Country	Arts and technologies ecosystem	Ecosystem dynamics
Brunei Darussalam	Emerging creative technology ecosystem with strong government interest but limited infrastructure and investment.	**Trends:** Growing interest in AI-driven fashion design and digital innovation. **Practices:** Fashion designers are using GenAI to streamline the design process, reduce production time, and tailor designs based on market trends and consumer feedback. **Technologies:** GenAI tools like Midjourney and NewArc.ai, Marvelous Designer for 3D clothing design, Procreate for digital sketching. **Policy coordination:** Government initiatives are encouraging digital innovation, though more infrastructure and investment are needed to fully support growth. **Notable intersection:** Fashion design and GenAI.
Cambodia	Developing ecosystem with increasing integration of digital technologies into cultural heritage and contemporary art, though infrastructure and funding challenges persist.	**Trends:** Increased use of digital technologies in cultural heritage and contemporary art projects, including the use of GenAI for enhancing visualisations. **Practices:** Artists and architects are integrating digital technologies like LiDAR to explore and preserve cultural heritage while merging contemporary art practices with new media. **Technologies:** LiDAR technology, GIS for archaeological research, multimedia tools like Blender for 3D modelling. **Policy coordination:** Policy support is growing, particularly through collaborations with international organisations, but further coordination is needed to overcome infrastructure limitations. **Notable intersection:** Architecture, contemporary art, and new media.
Indonesia	Rapidly evolving ecosystem with a focus on integrating technology into traditional art forms, supported by a growing tech-savvy population.	**Trends:** Expansion of immersive and interactive art experiences, along with the adoption of GenAI in creative processes. **Practices:** Artists are pushing the boundaries of traditional installation art by incorporating technology to create multisensory experiences and using GenAI to enhance creativity. **Technologies:** AR/VR platforms, multimedia software like Adobe Creative Suite, interactive sensors. **Policy coordination:** Government policies are actively promoting digital innovation and supporting the creative industries, with a focus on fostering a tech-savvy population. **Notable intersection:** Technology-based installation art.
Lao PDR	Developing ecosystem with growing interest in digital technologies for cultural expression, particularly in animation and contemporary arts.	**Trends:** Growing focus on digital animation as a medium for cultural expression, with an emphasis on claymation and GenAI storytelling. **Practices:** Artists are integrating digital tools with traditional methods, like claymation, to create culturally resonant works, exploring GenAI for storytelling and visual effects. **Technologies:** Animation software like Adobe Animate, claymation tools like Dragonframe. **Policy coordination:** Policy efforts are beginning to support digital arts, though more targeted initiatives are required to build infrastructure and access to technology. **Notable intersection:** Animation and contemporary arts.
Malaysia	Mature ecosystem blending traditional and digital practices, particularly in music production, with strong government support and an active digital community.	**Trends:** Fusion of traditional music with digital production to create new musical genres, with an emerging interest in GenAI for music composition. **Practices:** Musicians are preserving cultural heritage by digitally recording traditional music, while experimenting with digital tools, including GenAI for sound design. **Technologies:** Digital audio workstations (DAWs) like Ableton Live, sound editing software like Audacity. **Policy coordination:** The government is highly supportive of digital innovation, providing funding and infrastructure for creative industries to thrive. **Notable intersection:** Traditional and digital music production.

Myanmar	Emerging ecosystem with interest in new media art and the metaverse, driven by a small but innovative community amidst political and economic challenges.	**Trends:** Exploration of socio-political themes through immersive digital environments, with GenAI used to create virtual spaces and narratives. **Practices:** Artists are using VR and the metaverse to create immersive art pieces for socio-political expression, incorporating GenAI for creating virtual environments. **Technologies:** Basic VR platforms, multimedia software, and social media for digital art dissemination. **Policy coordination:** Policy coordination is limited due to political challenges, but grassroots initiatives are driving innovation in the creative sector. **Notable intersection:** New media art and the metaverse.
Philippines	Robust ecosystem, particularly in animation and content development, with growing international collaboration and industry support.	**Trends:** Expansion of the 3D animation sector, focusing on global content markets, and increasing use of GenAI for optimising animation workflows. **Practices:** Studios and animators are enhancing their content development capabilities with advanced 3D animation technologies, using GenAI to streamline content creation. **Technologies:** 3D animation software like Blender, Autodesk Maya, content development platforms. **Policy coordination:** Government policies support the growth of the animation industry, with a focus on international collaboration and content export. **Notable intersection:** 3D animation and content development.
Singapore	Leading hub for new media and metaverse technologies in Asia, supported by strong infrastructure, government initiatives, and an international network of creative professionals.	**Trends:** Positioning as a leading centre for metaverse development and digital media innovation, with significant adoption of GenAI for immersive digital environments. **Practices:** Innovators are pioneering the creation of metaverse experiences and digital media, pushing boundaries in immersive digital spaces, using GenAI for creating digital art. **Technologies:** Metaverse platforms, AR/VR technologies, blockchain applications for digital art. **Policy coordination:** The government provides robust support for digital innovation, with comprehensive policies to position Singapore as a global leader in creative technologies. **Notable intersection:** New media and metaverse.

Thailand	Vibrant creative technology ecosystem with significant growth in areas such as bioart, digital media, and immersive technologies, often focused on ecological, scientific, and cultural themes.	**Trends:** Growing trend of bioart exploring environmental sustainability and the interaction of living organisms with art. Increasing interest in digital media that preserves cultural heritage and the use of VR/AR to create immersive experiences. **Practices:** Artists are collaborating with scientists to create bioart that interacts with biological systems. Additionally, they are engaging with digital platforms to produce interactive installations and multimedia art, utilising VR/AR technologies for cultural preservation and immersive storytelling. **Technologies:** Biohacking kits, digital sensors, multimedia software, VR/AR platforms like Oculus and Unity, GenAI tools for digital media production, Adobe Creative Suite. **Policy Coordination:** Government initiatives promote interdisciplinary collaboration, cultural preservation through technology and innovation in the creative industries. **Notable intersection:** Bioart and technology.
Timor-Leste	Early-stage ecosystem with efforts focused on preserving traditional culture through digital means and building infrastructure.	**Trends:** Increasing efforts to digitally preserve and share traditional music with a global audience, with exploration of GenAI for music distribution and preservation. **Practices:** Musicians are recording traditional music using digital tools and sharing it through online platforms, experimenting with GenAI for enhancing distribution. **Technologies:** Digital recording tools, social media for distribution, digital archiving platforms. **Policy coordination:** Government initiatives are beginning to focus on digital preservation of cultural heritage, though more support is needed to develop the broader ecosystem. **Notable intersection:** Traditional music and digital production and distribution.
Vietnam	Rapidly growing ecosystem with a strong emphasis on new media art and immersive technologies, supported by investment in education and industry.	**Trends:** Growth of immersive art installations and digital exhibitions, with increased use of GenAI to enhance interactive elements and create digital art. **Practices:** Artists and technologists are collaborating to create immersive experiences that blend physical and digital worlds, using GenAI for digital art creation. **Technologies:** VR/AR technologies, multimedia platforms for digital art creation. **Policy coordination:** The government is actively investing in digital and immersive technologies, with policies aimed at fostering innovation and supporting the creative industries. **Notable intersection:** New media art and immersive technology.

Open Chedi (2023), 3-pieces sculpture, polystyrene foam, plywood, fluorescent paint, @vuthlyno.art, Commissioned by Thailand Biennale Chiang Rai 2023. Source: Supernormal Studio
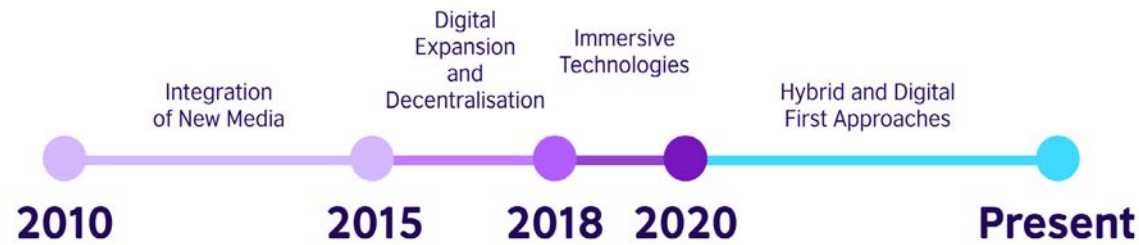
Evolution of arts and technology intersections in ASEAN, from 2010 to present

## Evolution of arts and technology intersections in ASEAN

In the early to mid-2010s, ASEAN saw a stronger integration of new media,including digital media, video, and electronic elements, into their practices. This period marked a shift from traditional art forms to more experimental and technologically-driven approaches, influenced by the increasing accessibility and affordability of digital technologies globally (Taylor, 2012). Digital media and the internet were replacing traditional media across the world during the same period. The traditional view of artists also began to evolve as they adopted digital tools, expanding the definition of what it meant to be a creator in the digital age.

In the Philippines, the animation industry transitioned from traditional cel animation to 3D digital techniques, which allowed animators to create more dynamic and visually complex stories. The shift to 3D technology allowed for greater flexibility in storytelling and visual effects, making the Philippines a competitive player in the global animation industry. In Vietnam, artists like Le Thanh Tung (aka Crazy Monkey) started incorporating real-time graphics, augmented reality, and immersive multimedia into their work at this time.

The mid-2010s saw a significant expansion and decentralisation of digital technology. This period was characterised by the widespread adoption of digital tools and social media platforms, which became crucial for artists to showcase their work and reach global audiences. An example of this shift can be seen in the band KLAMAR from Timor-Leste, which started promoting their music through digital platforms at this time. This reflects a wider trend towards supporting creative sectors as economic drivers across the globe.

The late 2010s introduced immersive technologies such as augmented reality (AR), virtual reality (VR), and artificial intelligence (AI) into the creative sector in ASEAN. These technologies enabled artists and cultural institutions to push the boundaries of traditional art forms and create even more dynamic, interactive experiences. In Singapore, Serial Co, developed VR installations that offered immersive environments with museums and galleries as main clients.

During this period, governments began to reflect on how policies could be adjusted to better support initiatives that combined art and culture with digital and entrepreneurial activities. ASEAN's creative economy was influenced by international policies, particularly those from the UK, which had pioneered approaches to integrating creative industries with digital innovation and entrepreneurship (Flew, 2019). This played a role in shaping the region's policy adjustments and the proliferation of creative hubs and makerspaces.
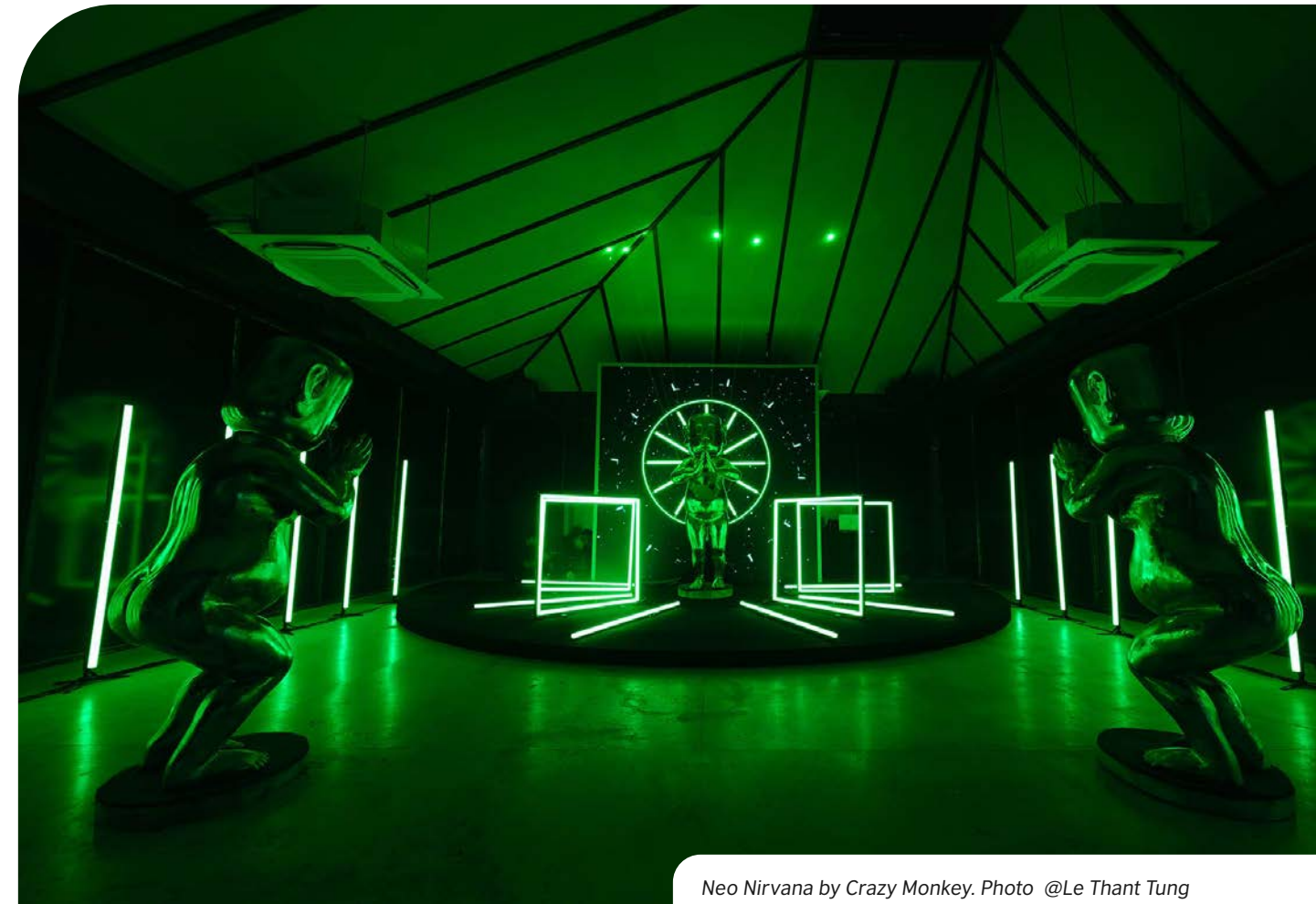
Neo Nirvana by Crazy Monkey. Photo @Le Thant Tung

The 2020s brought a significant shift towards hybrid and digital-first approaches in the arts, triggered largely by the Covid-19 pandemic. Artists and organisations had to pivot to online platforms. Following the pandemic, policies increasingly focused on digital upskilling, multidisciplinary educational programmes, and job resilience in the creative sector. For example, the Year of the Creative Economy in 2021, led by Indonesia, underscored the importance of creative industries as a driver for economic recovery post-pandemic.

The public launch of GenAI saw significant advancements. Artists started using new tools to experiment with creative processes, though they also faced challenges related to the originality and ownership of AI-generated works. Concerns over ethics and copyright in art creation raised questions about originality and authenticity (Lindvall, 2020). New business models, such as NFTs (Non-Fungible Tokens), emerged, offering artists novel ways to monetise their work and engage with global markets. Platforms like Foundation and OpenSea became popular as an alternative revenue stream.

Pushing tech frontiers

What are the technologies being used, adapted and advanced by practitioners in the region? From the case studies, we have grouped them according to their primary functional roles—such as lighting, sound, sensors, and immersive technologies. Each category represents a distinct area of application within creative practices.

Lighting technology

Lighting technology is essential in creative applications, allowing precise control over light sequences, colour, and movement. Systems like DMX (Digital Multiplex), developed in the 1980s, revolutionised stage lighting and are now widely used in art installations to create immersive environments (USITT, 1990). In ASEAN, artists such as Bagus Pandega and Tromarama push this technology by integrating DMX with software like TouchBase and microcontrollers like Arduino. This enables them to choreograph complex, real-time lighting effects that respond to viewer interactions.

Immersive technology

Immersive technology, including Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), blends physical and digital worlds to create engaging, multi-dimensional experiences. These technologies have evolved significantly, from early VR experiments in the 1960s to modern AR applications like Pokemon Go (Lanier, 2017; Niantic, 2016). In ASEAN, artists like Enchax from Myanmar integrate AR into his projects, which transforms traditional cultural symbols into interactive digital experiences.

Live realtime (or "hot") set at Robosheep, Philippines. Photo courtesy of Micah Fernandez.

3D technology

3D technology involves creating, rendering, and interacting with three-dimensional models and environments, transforming both creative and industrial sectors. Significant advancements include the development of real-time rendering engines like Unreal Engine and 3D printing (Sutherland, 1968; Epic Games, 1998). In ASEAN, the Philippines' Robosheep exemplifies innovative use of 3D technology by using Unreal Engine to produce virtual sets for film and digital content. This enhances storytelling flexibility and reduces the need for physical sets.

Sensors

Sensors detect and measure physical properties such as light, motion, and distance, converting them into data used in various applications, including interactive art and cultural preservation. In ASEAN, sensor technology is creatively and effectively applied in projects like the Cambodia Archaeology LiDAR Initiative (CALI). This initiative uses LiDAR technology to create detailed 3D maps of ancient sites such as Angkor Wat. It showcases how sensors can play a crucial role in both heritage preservation and advancing creative practices (UNESCO, 2019).

Sound production

Sound production technology encompasses tools and systems used to record, manipulate, and reproduce sound, evolving from analog devices to modern digital audio workstations (DAWs) like Pro Tools (Avid Technology, 1991). These technologies are vital in music production, film scoring, and live sound engineering. In ASEAN, artists like Analog K in Malaysia and KLAMAR in Timor-Leste are leading the integration of advanced sound production technologies into their work.


3D wire frame of Market; Angkor Wat West Gate, 12th Century. Source: VirtualAngkor.com

Innovations across the cultural cycle

In this section, we explore how intersections in trends, practices, technology and policy coordination are driving transformation and innovation in ASEAN. By using UNESCO's cultural cycle as an analytical framework, we map developments in creative technology through different stages, from creation, production, distribution, delivery, and consumption.

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These advancements do not simply enhance traditional practices. They create entirely new paradigms of artistic expression and redefine how technology should be used, pushed, and valued within the creative process. Findings show that artists and creative professionals are not mere users of technology. Instead they challenge and push technological capabilities, demonstrating a dual role as both users and innovators. (Klinger & Svensson, 2018)

They demonstrate that technology is not merely a tool but a driving force in the cultural and artistic transformation of the region. Through this, they are setting new standards for creativity, research and development**,** and engagement.
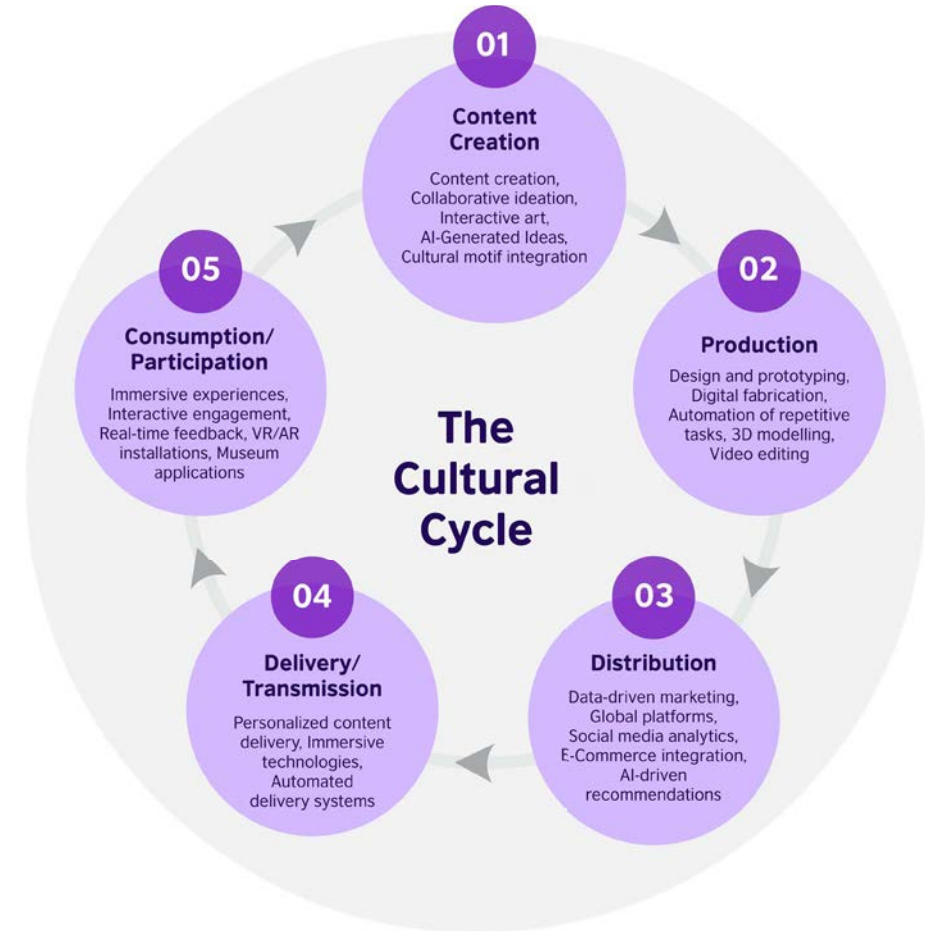
Innovations across the cultural cycle

The **creation** stage involves the generation of ideas and content, where artists and designers use various tools to develop initial concepts. In ASEAN, this process is being revolutionised by GenAI, digital tools, and immersive technologies. These innovations enable collaborative ideation and the integration of AI-generated ideas with cultural motifs.

Production focuses on the realisation of creative ideas into tangible or digital products. Advanced technologies such as 3D modelling, digital fabrication, and automation are enhancing this stage by streamlining the production process. In ASEAN, these tools are key in enabling precise design, rapid prototyping, and efficient video editing.

Distribution refers to the ways in which creative products are made available to audiences. This stage is increasingly facilitated by digital platforms and data-driven strategies. In ASEAN, social media analytics, e-commerce integration, and AI-driven recommendations are crucial.

Delivery or transmission involves the method by which creative content reaches the consumer. In the ASEAN region, personalised content delivery is made possible through immersive technologies and automated systems. VR, AR, and other digital platforms are used to provide tailored, immersive experiences, blending traditional and modern elements in innovative ways.

Consumption and participation involve how audiences interact with and experience creative products. The use of VR/AR installations, real-time feedback, and museum applications allows for active participation, with creative content being accessed through online streaming services, virtual platforms, and physical spaces.

Arts and creative practices

Fashion design. Emerging fashion designers are transforming their industry through the use of GenAI, enabling them to do more effective and less costly product development. In Brunei Darussalam, this technology allows for rapid prototyping and precise pattern creation, which streamlines production. Digital platforms facilitate faster distribution and real-time customisation, with fashion increasingly delivered and consumed through online channels, expanding the reach of traditional designs.

New media and contemporary art. New media artists are giving way to provocative works through the use of 3D mapping technologies and referring to architectural heritage. In Cambodia, these tools are used to create immersive experiences that digitally reconstruct historical events and sites while engaging the public in new ways. The resulting works are distributed through physical installations in public spaces and digital platforms, enhancing accessibility and interactivity in art consumption.

Contemporary artists are pushing the boundaries of technology-based installation art by communicating local narratives in unique ways. In Indonesia, the integration of fine arts like sculpture with technology such as sensors and 3D printing is supported by a growing digital and art market

infrastructure. Audiences engage with works both physically and through online platforms.

Through bioart explorations, artists are integrating contemporary practices such as interactive installations, environmental art, mixed media, and performance art. In Thailand, they are creating immersive and thought-provoking works that engage with scientific concepts and environmental concerns. Works are often presented through galleries, museums, public spaces and online platforms.

Artists are also exploring the metaverse to revolutionise expression and audience engagement. In Singapore, VR and AR technologies are enriching cultural education for learners through immersive experiences. In Myanmar, the metaverse offers a digital space where artists can explore themes of resistance, identity, and cultural narratives that traditional media might not fully capture.

Finally, artists are using immersive technology to transform the storytelling of local themes like historical events, folk art, and mythology. In Vietnam, artists are incorporating VR and AR to increase the interactivity and multisensorial impact of their works. This innovative approach provides fresh, engaging perspectives to audiences, turning traditional narratives into dynamic, modern experiences.
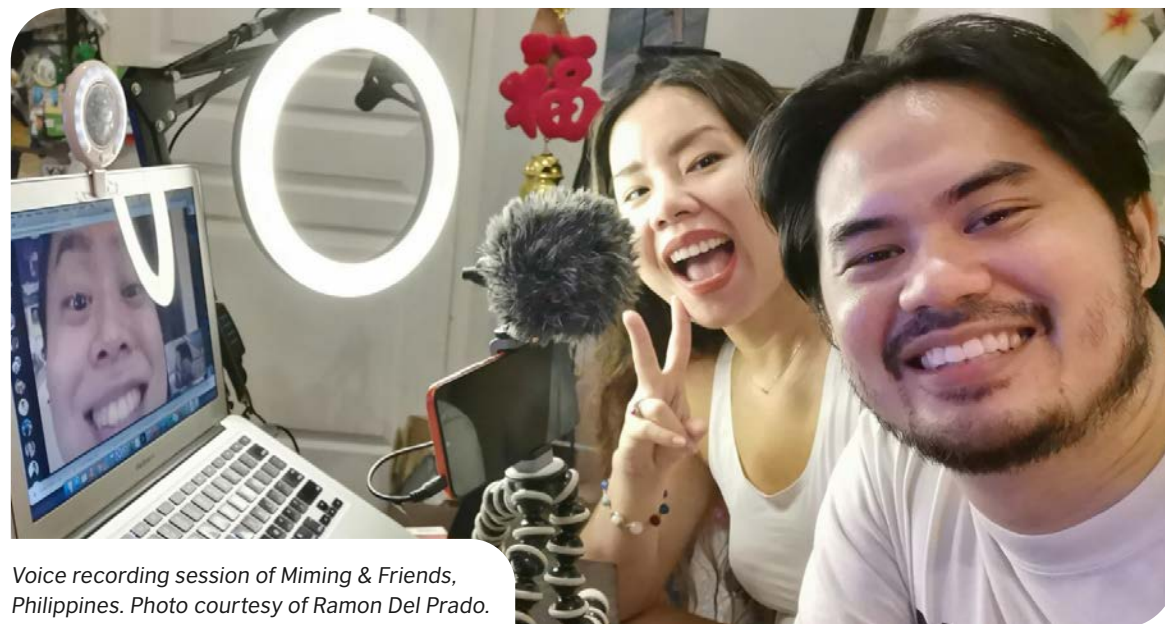
Voice recording session of Miming & Friends, Philippines. Photo courtesy of Ramon Del Prado.

Animation, film and video production. Film and animation producers are advancing the field of 3D animation by pioneering real-time technologies that enhance visual storytelling. Studios in the Philippines are pioneering the use of real-time 3D technologies, integrating 3D assets into live production environments, which significantly enhances the quality and efficiency of film production. This high-quality content is increasingly distributed through digital media platforms, allowing it to reach global audiences primarily via streaming services.

Animators are revitalising traditional techniques by integrating contemporary technology into their practice. Artists are enhancing storytelling by adapting claymation techniques to local conditions, using lightweight, non-melting clays to overcome climate challenges. Advancements are supported by

strategic collaborations and educational programmes, which foster a growing interest in creative technology and ensure the preservation and modernisation of Laotian cultural heritage. This approach helps preserve cultural practices while adapting them to contemporary global standards.

Music. Musicians are skillfully blending traditional instruments with electronic music by using AI and digital tools, leading to the creation of new genres, styles and unique soundscapes. In Malaysia, the use of digital platforms and AI has expanded the music industry's global reach. These platforms also provide musicians with valuable insights into audience preferences and market trends. Similarly, in Timor-Leste, artists use digital audio workstations and streaming platforms not only to produce and distribute their music internationally but to gain a better understanding of their audience.

Khairul Hazwan Musa, aka Analog K (Malaysia). Photo courtesy of the artist.

Key characteristics

The key characteristics of ASEAN's arts and technologies ecosystem are exemplified by interdisciplinarity, evolving creative jobs, humanity in technology, power dynamics between art and tech, and redefining innovation.

Interdisciplinarity. The ecosystem is increasingly characterised by interdisciplinarity, where boundaries between traditional art forms, new media, and technology are blurred. Initiatives often bring together art, science, digital media, and community engagement. Examples highlight the evolving role of artists, who are increasingly becoming researchers, innovators, coders, and entrepreneurs. But more importantly, this evolution highlights the capacity of artists as connectors of knowledge and life-long learners. They synthesise information from various disciplines to create new insights and foster continuous learning within their communities.

Interdisciplinarity brings significant advantages to both industry and art practices, impacting business, creative outputs and audiences. For the industry, it fosters innovation, streamlines processes, and opens up new markets. It expands art practices by enabling new forms of expression and facilitating audience engagement. It enhances how diverse media tell and share stories.

Tech-based installation works like Bagus Pandega's "Yesteryears"(2020) incorporate 3D printing to transform Sidoarjo mud, sourced from a catastrophic mudflow in East Java in 2006, into sculptures. This disaster caused by drilling activities displaced numerous communities, erasing entire villages. By using 3D printing, Pandega meticulously recreated drawings of lost homes provided by the affected locals, thus preserving and honouring their memories. Local Indonesian motifs and contexts were merged through kinetic elements, sound and video elements. The work highlights community resilience by emphasising the ongoing impact of natural disasters in Indonesia. It is a result of a synergistic intersection between sculptural practice, 3D printing technology and local narratives.

Bagus Pandega, Yesteryears, 2023, (detail) 3D printing machine, Sidoarjo mud, plywood base, installation view of one of three 3D printing machines.
Collection of the artist, courtesy of ROH.
Image courtesy of Museum MACAN, Indonesia.

In Brunei Darussalam, fashion designers are increasing their skills in digital research and development. Brands like NA FORRÉR and Mahkota Designs utilise GenAI tools such as Midjourney and NewArc.ai for product development. These tools allow designers to generate a vast array of design variations quickly, which significantly reduces the time and labour involved in traditional design processes. This not only boosts efficiency but allows designers to experiment with more unique patterns. For instance, Mahkota Designs has been able to produce intricate and culturally inspired garments at a fraction of the time, enabling them to cater to both local and international markets.

In Thailand, artists like Henry Tan and Wave Pongruengkiat merge art and science through emerging practices like bioart. Henry Tan, for example, uses living organisms and biological processes to create art that integrates cutting-edge biotechnological techniques and digital tools. One project involves the use of CRISPR gene editing to modify microbial cultures, which are then digitally monitored and visualised using sophisticated software. CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a revolutionary gene-editing technology that allows scientists to make precise, targeted changes to the DNA of living organisms. By using CRISPR, Tan can create living artworks that evolve over time, challenging viewers to consider the implications of genetic manipulation and digital surveillance. Similarly, Wave Pongruengkiat's work integrates scientific research with digital technology through pieces that integrate human anatomy and augmented reality (AR).

Additionally, in Singapore, the ArtScience Museum collaborates with tech companies to create immersive exhibitions that use virtual reality (VR) and augmented reality (AR) to provide interactive educational experiences for audiences. One notable example is the "Into the Wild" exhibition, developed in collaboration with Google and Lenovo, which transforms the museum into a virtual rainforest. Visitors use AR-enabled devices to interact with digital animals and learn about conservation efforts. The immersive experience not only enhances storytelling by making it interactive and engaging but also educates the public on important environmental issues. Such collaborations between art institutions and tech companies exemplify how cross-disciplinarity can enhance educational outreach and create compelling narratives that resonate with a broad audience.

Interdisciplinarity also puts into question different perceptions around creativity, highlighting that it is not just about expression but a tool for innovation, development, and dialogue. Creativity is a complex interaction between an individual's work, social environment, and broader cultural context (Csikszentmihalyi, 1996). Our findings demonstrate that governments largely share this view in varying degrees, and believes in creativity's potential contribution to technological advancement, social change, and economic growth. Policies like the National Creative Industry Policy (Dasar Industri Kreatif Negara, DIND) in Malaysia support this notion by integrating arts and creative practices with technology and innovation and encouraging collaboration between artists, scientists, and technologists.

Evolving creative jobs and artistic work.
Technology has transformed creative jobs and artistic practices. While there's a growing demand for conceptual thinking, technical digital knowhow, and tasks that involve decision-making and planning, automation is also reducing the need for some manual skills, leading to uncertainty and job insecurity.

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Consequently, artists and creative professionals now need to continuously update their skills to stay relevant or competitive in the job market. This shift underscores the importance of adaptability and lifelong learning, where high-level creative skills are crucial to navigate an increasingly digital and automated world.

The advent of digital collaboration and online transactions is changing ways of working. Design processes like research, prototyping, and ideation now require additional digital knowhow. Remote working has become a norm through platforms like Zoom, Slack, and Google Workspace. This setup enables artists to engage in projects without geographical constraints and offer greater flexibility and access to international markets. Online transactions and digital payment systems like PayPal and Stripe streamline art sales, making it easier to manage finances and conduct business globally.

Amidst this context, more and more artists are increasingly motivated to turn creative skills into sustainable livelihoods. Serial Co from Singapore, founded by new media artist Jake Tan in 2020, started his business model around creating augmented reality and has since moved into building immersive experiences with the help of sensors that translate data into digital settings.

Artists are self-marketing and bypassing traditional gallery-dependent models. Platforms like Instagram, TikTok, and YouTube allow them to reach global audiences directly, showcase their work and build a personal brand without the need for intermediaries. Indonesian digital artist Livi Zheng sold her NFT artwork for 12 ETH (approximately USD 36,000) on OpenSea, highlighting income potential. However, this trend seems to have decreased in terms of hype since Covid-19.

Humanity in technology. Amidst advanced technologies, artists are making an effort to humanise their work. Tech founder Herman Narula envisions the metaverse not just as a virtual space but as an extension of human reality, where digital and physical experiences converge to create new forms of social and cultural interaction. According to him, the metaverse allows for unprecedented levels of expression and community-building, providing a platform where identities can be explored and expanded in ways that are not possible in the physical world (Narula, 2022).

Technology has become a bridge that facilitates fundamental questions around human identity and existence (Jones, 2019). Artists can now create entire worlds that simulate human interactions. This raises profound questions about how we interact, learn and consume in today's world. Lao artist Souliya Phoumivong, for example, prefers to explore the tactile part of his craft through clay animation, even though animation has become so high-tech. This approach demonstrates that "slow tech" or "low tech" can be just as meaningful. By emphasising the tangible, Phoumivong maintains a deep connection to traditional artistic practices while engaging with contemporary themes.

Flow, 2018 Single-channel HD video, colour, sound 8 minutes 50 seconds Installation of clay sculptures.

Artwork courtesy of Souliya Phoumivong, Lao PDR

Among the case studies, spirituality emerged as an unexpected yet profound theme. It can be attributed to the region's rich cultural heritage and deeply ingrained religious traditions. They often shape artistic expression, reflecting the interconnectedness of life, belief systems, and the natural world. This is particularly significant in Southeast Asia where artists are exploring and reinterpreting heritage in ways that resonate with contemporary audiences (Jones, 2019).

Le Thanh Tung's multimedia exhibition "Neo Nirvana", in Vietnam, utilises augmented reality and interactive installations to reimagine Buddhist motifs of awakening, healing, and faith in a digital age. This fusion is able to present multi-layered views around spirituality to contemporary audiences. Similarly, in Thailand, artists like Henry Tan combine ancient Hindu symbolism with cutting-edge science and technology. His work exemplifies how traditional spiritual themes can be revitalised through innovative artistic practices, creating a dialogue between the past and the future.

Artists in Myanmar are pioneering practices in the metaverse and augmented reality, which emphasise human experiences and cultural narratives. ZUNE (Thoughtform), a graphic and 3D designer, explores virtual reality and immersive experiences. Influenced by mystery games and interactive fiction, ZUNE's practice revolves around mythologies, spirituality, and ethereal realms. Her works, such as Rite of the Ocean (2023) and Scryers (2022) demonstrate VR's potential to offer new artistic dimensions.

Entrance to :\screensaver exhibition. The interactive function allows visitors to see each other, chat through voice and text as avatars.

Image courtesy of exhibition designer ZUNE (Thoughtform), Myanmar.

Redefining innovation. The socio-political landscape of ASEAN greatly informs creative expressions. Artists are exploring narratives around healing, climate resilience, and socio-political dialogue, which redefines what it means to be innovative.

In Myanmar, amidst militarised political turmoil, artists like Ko Latt are using virtual reality (VR) and the metaverse to create immersive experiences that offer an outlet for dissent and self-expression. Ko Latt's work includes VR installations that depict life under authoritarian rule, allowing viewers to experience the harsh realities faced by many in Myanmar. Immersive environments enable anonymous sharing and interaction, providing a safe space for expression. In Timor-Leste, KLAMAR's history-inspired fusion music and its potential for global reach is able to offer alternative cultural narratives to diverse audiences.

Vuth Lyno from Cambodia employs new media to explore themes of cultural memory. His work, "Light Voice," transformed an abandoned staircase into an illuminated, sound-activated art piece to symbolise the reclaiming of neglected urban spaces. It was located in the White Building, originally known as the Municipal Apartments, constructed in the 1960s and was a symbol of Cambodia's modernisation. The building fell into disrepair and became notorious during the Khmer Rouge regime when many of its residents were persecuted. By revitalising a part of this historical structure, Lyno's installation served as a poignant reminder of Cambodia's past and a beacon of hope for the future (Chhay, 2021).

In Thailand, the collective, Freak Lab merges arts, science, and technology to create works that address ecological issues. A notable project involves bioart installations using genetically modified bacteria to create living art pieces. This project demonstrates the potential of the sciences in artistic expression while raising awareness on genetic engineering. Through such projects, Freak Lab integrates scientific inquiry with artistic practice, showcasing how creative technologies can drive ecological awareness and innovation. Art-science collaborations are more crucial than ever as the world faces challenges in communicating complex concepts and advocacy around climate change (Jones, 2020).

Henry Tan (Henry and Partners), Dancing Brain 2022, Thailand.

Photo courtesy of the artist.

Animators, Ramon Del Prado and Meryll Yan, through their show, "Miming and Friends," utilise 3D technology to create relatable, lifelike characters. Their mission is to foster empathy and understanding among children by addressing social issues and emotional growth through engaging narratives. They leverage open-source technologies such as Blender for 3D modelling and animation, and Godot Engine for game development, which allows them to produce high-quality content while maintaining creative freedom and cost efficiency.

Power dynamics between art and tech. The ownership of technologies in the creative sector ranges from big tech companies to open-source platforms, significantly impacting the level of control artists have. Big tech companies dominate the arts and creative technology ecosystem. Adobe Creative Cloud, for instance, generated over USD 11.5 billion in 2023 (Statista, 2023), with Photoshop being used by over 90% of creative professionals. Meta controls nearly 75% of global social media usage, while Google powers 88% of search engines worldwide. This has created dependencies through restrictive licensing, high fees and potential barriers to entry for smaller or independent creators.

Open-source platforms offer more flexibility but lack the resources and support of proprietary systems, highlighting the need for more equitable tech resources in the creative sector. They allow artists to modify software to suit specific needs and push boundaries without the constraints imposed by proprietary systems (Graham & Dutton, 2019). In Indonesia, artists like Bagus Pandega utilise a blend of proprietary and open-source technologies such as TouchDesigner, Arduino, and DMX Lighting to create interactive installations that explore themes of memory, loss, and resilience.

Despite the empowering aspects of technology, the market power of big tech companies often dictates accessibility and affordability. In animation where cost is a significant factor, Ramon Del Prado and Meryll Yan from the Philippines navigate this by creating entire animation pipelines on a mid-tier gaming laptop. Their reliance on open-source software like Blender not only reduces expenses but enables them to optimise modest hardware setups effectively.

In Lao PDR, limited funds and access to legal and up-to-date software forces artists to rely on pirated copies, posing legal risks and undermining the stability and functionality of their creative tools. The lack of infrastructure and financial resources exacerbates the divide. In Cambodia, despite significant investments in cultural heritage projects using technology, these activities remain under-resourced and lack government support.

Intersections and adaptations in GenAI

The impact of GenAI on the arts and creative technology is undeniable. Stakeholder interviews revealed mixed sentiments, seeing its arrival as a double-edged sword. Not surprisingly, industry leaders and technologists see it as **a transformative tool** that can drive innovation and democratise access to creative tools. A more **balanced perspective** from some artists, policymakers and educators acknowledged AI's potential while emphasising the need for responsible use. However, some are more **cautious**, stressing the importance of robust frameworks to address ethical challenges and prevent job displacement. On the **critical end**, some artists and curators expressed scepticism, fearing that AI could erode the human touch in creativity and exacerbate inequalities.

AI encompasses a broad range of technologies and tools designed to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and understanding natural language. Its origins have a rich history, dating back to the mid-20th century. Viewed through a Western lens, pioneers like Alan Turing and John McCarthy began exploring the potential of machines to simulate human intelligence.

AI can be broadly categorised into two types: narrow AI and general AI. Narrow AI (or weak AI) is designed to perform specific tasks and operates within a limited domain (AI for Social Good, 2023). Examples include virtual assistants like Siri and Alexa, image recognition systems, and recommendation algorithms used by platforms like Netflix and Amazon. These systems are highly specialised and operate under predefined constraints.

GenAI is a key subset of general AI that uses algorithms and huge datasets to develop models capable of generating original content, including text, images, music, and more, based on input data. The technology has seen rapid advancements in recent years, leading to the creation of highly sophisticated models capable of producing human-

like content. For instance, GenAI can be used to create realistic digital art, compose music, and even generate video content. Tools like ChatGPT, Claude 3, and Dall-E exemplify it by leveraging advanced natural language processing to assist with tasks such as writing, summarising information, and answering questions based on vast datasets. (OpenAI, 2023).

Emerging practices and trends

Stakeholders are experimenting and integrating GenAI through:

Cultural preservation and restoration. AI is being actively employed to preserve and restore cultural heritage, providing specific and impactful examples of its application. In Myanmar, GenAI is used to restore damaged historical images and artefacts, such as filling in missing parts of ancient texts and artworks to maintain their historical accuracy. For instance, artists and technologists use AI algorithms to digitally reconstruct and preserve the intricate designs of temple murals and sculptures that have been damaged over time. This not only helps in the physical restoration of cultural artefacts but ensures that digital archives are maintained for educational and cultural promotion.

Addressing ethical boundaries. The integration of AI in the arts prompts artists to push and critique ethical boundaries. This critical approach encourages dialogue on its ethical use and impact on creative production. In Malaysia, artists like Analog K and Vimala Perumal reflect on the commodification of art and the erosion of traditional skills in an AI-driven landscape. According to them, AI should serve to enhance rather than replace human creativity.

Highlighting misinformation and manipulation. Stakeholders mentioned how AI is being used to address and highlight the spread of misinformation. Artists are exploring works that illustrate how AI can distort information, generate fake news, or alter historical narratives, raising awareness about the potential dangers of unchecked AI technology. In Myanmar, artists and educators like Aung Myat Htay use AI in their work to

demonstrate these risks, emphasising the need for ethical AI usage and robust regulatory frameworks to prevent misuse.

Creating interactive and personalised narratives. GenAI is supporting the creation of works that engage audiences and cultural heritage in novel ways. This involves using AI to generate real-time responses to viewer interactions. The "Voice Gems" project by Reeps100 (Harry Yeff) and Trung Bao in Vietnam aims to celebrate individuality by transforming unique voice recordings into visual art or gems. The project employs AI to analyse voice recordings, identifying specific audio characteristics such as pitch, tone, and rhythm, which are then mapped and generated into intricate digital gemstones. "Voice Gems" is a powerful and engaging educational tool that allows audiences to experience cultural diversity in an innovative and immersive manner.

Mahkota Designs (Brunei) Integrating AI into the design process.

Critiquing the value and meaning of creativity. The rise of AI in the arts has sparked debates about the true nature of creativity and the role of human input in artistic creation. It underscores a broader trend: despite technological advancements, the essence of creativity is still largely viewed as a human, analogue endeavour.
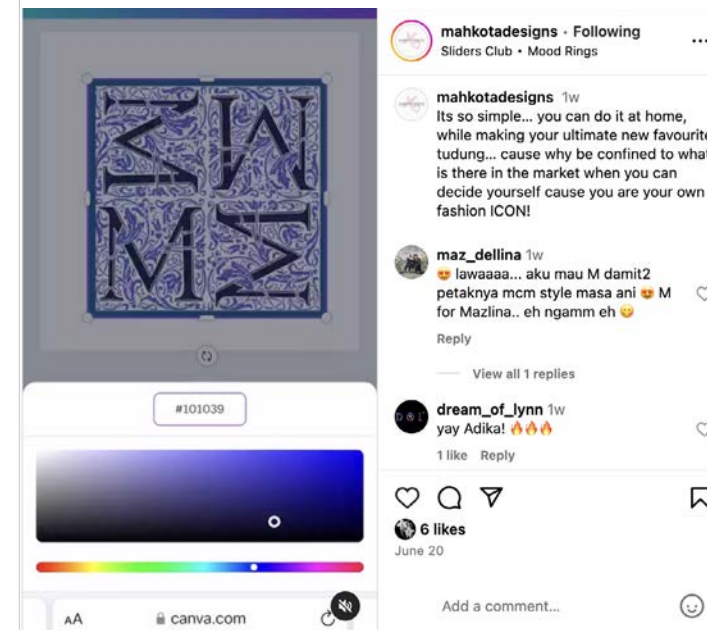
AI serves as a tool that can augment but not necessarily replace the uniquely human aspects of artistic creation.

—

"You could say that with AI, everyone can become makers. Everyone is a maker in this era of technology. But not everyone becomes a creative maker. That's the challenge. Not everyone becomes creative."

- Ignatia Nilu

Nilu further explains, "AI creates a distortion between critical thinking and critical making….There is a gap between critical thinking and creative thinking."

Education and training. AI is also being leveraged for education and training within the arts and creative industries. This creates new opportunities for personalised learning and skill development. In Brunei Darussalam, one of the most attended sessions at the Brunei Innovation Lab (BIL) was "101: Artificial Intelligence in Creativity" by Liyana Hanif, held in 2023. This high attendance indicates a strong public interest in understanding and utilising AI in artistic practices. Workshops like these provide participants with hands-on experience in using AI tools, enabling them to incorporate these technologies into their creative processes effectively. Furthermore, in Singapore, educational institutions use AI to create adaptive learning environments that adjust the curriculum based on student performance and engagement.

Challenges with AI use

Global North vs. Global South. The impact of GenAI on the creative sectors differs significantly between the Global North and South due to disparities in access to technology, infrastructure, and funding. Countries in the Global North have greater access to advanced AI technologies, robust infrastructure, and substantial funding, enabling artists to leverage it fully. In contrast, the Global South has limited access to technology, inadequate infrastructure, and insufficient funding, hindering the effective adoption and utilisation of AI tools. Artists often have to rely on basic technologies and face barriers like high costs and limited technical support (ASEAN Gen AI Report, 2024).

Ethical and intellectual property issues. GenAI raises significant intellectual property (IP) concerns, as it often utilises vast amounts of existing data, potentially infringing on copyrighted material. This creates challenges in delineating clear IP rights, possibly leading to legal disputes and financial losses for original creators. Additionally, AI can perpetuate biases present in training data, leading to discriminatory outcomes in generated content. The lack of transparency in AI decision-making processes complicates accountability. Ensuring AI systems are trained on diverse, culturally sensitive, and representative data is crucial to mitigating these risks. Moreover, the absence of robust regulatory frameworks in some ASEAN countries raises concerns about data privacy and the misuse of AI technologies. This leads to risks of unethical use and infringement on individual rights and freedoms.

Hallucinations: Large Language Models (LLMs) tend to 'hallucinate,' generating information that does not exist. This phenomenon occurs because LLMs produce text based on patterns learned from training data without understanding the content, leading to plausible-sounding but incorrect or fictitious information. This raises significant concerns about the validity and reliability of AI-generated content, further complicating the ethical and practical landscape for artists and creators.

Global collaborations

Global collaborations foster knowledge exchange, funding opportunities, and exposure to new technologies. They are often motivated by artistic innovation, economic growth, and social impact, providing artists and enterprises with access to international markets, advanced technological tools, and diverse artistic perspectives. Institutional partnerships help promote the region's creative industries and offer different pathways for development.

Meanwhile, global inequalities within the creative industries are pronounced, with developing ASEAN countries often trailing behind more developed nations in terms of infrastructure, funding, and market access. While global trade in creative goods grew at an average annual rate of over 7% from 2002 to 2015, ASEAN developing countries face significant challenges that hinder similar growth. For instance, China dominates this sector, contributing a significant portion to global trade in creative goods, while other developing nations struggle to keep pace (UNCTAD, 2022).

The UNESCO 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions seeks to address these disparities by promoting equitable international collaborations and balancing the trade in cultural goods and services. Despite these efforts, inequities persist, exemplified by partnerships where creative and financial control is predominantly held by entities from developed countries. For example, international film co-productions often see developed country partners retaining major revenue shares and creative decision-making power (ibid).

Multilateral relations between ASEAN and the UK

Colonial historical ties play a significant role in today's context. For example, many ASEAN countries have historical links with the UK, which facilitate cultural exchanges and open up new markets for their creative industries. Timor-Leste's connection with Portugal, on the other hand, promises avenues for music market development.

In Brunei Darussalam, while official collaborations are minimal, the close historical ties with the UK have led to significant investments and educational partnerships.

In Singapore, the collaboration between local artists and tech companies with global institutions has been instrumental in advancing the creative tech sector. The UK-Singapore Digital Economy Agreement (UKSDEA) and various joint initiatives have enabled artists to access cutting-edge resources and expertise, facilitating projects and international recognition. Malaysia's digital music sector, supported by policies like the Digital Content Ecosystem (DICE) Strategic Framework, leverages these collaborations to enhance local music production.

Artist and institutional collaborations

Several notable collaborations illustrate the dynamic partnerships between ASEAN artists and UK organisations. Not surprisingly, the British Council was identified as playing a crucial role in supporting creative sectors across ASEAN, funding initiatives, workshops, and residency programs that foster international collaboration and innovation.

In Indonesia, artists benefit from residencies and exchanges with UK institutions, allowing them to explore new media art and kinetic technologies. For example, the British Council facilitated a residency programme in Liverpool, enabling artists to develop projects and expand international networks.

In Malaysia, collaborations with UK organisations and festivals provide opportunities for exchange, funding, and exposure. Institutions like Limkokwing University of Creative Technology collaborate with UK entities to offer accredited programmes and practical experience in fields such as fashion, IT, multimedia, and design. These partnerships enhance the skills and knowledge of Malaysian students.

In Singapore, the Performing Arts and Tech Lab, mentored by experts from the UK's National Theatre, exemplifies successful collaboration. This program has provided artists with insights into immersive technologies and production techniques, contributing to the maturation of the local arts scene.

In Timor-Leste, collaborations with international artists, including sound engineers and DJs from the UK, have enriched the local music scene. These partnerships have introduced new techniques and perspectives, enhancing the quality of music production and broadening the creative horizons of Timorese artists. The UK also supports Timor-Leste's efforts to join the ASEAN Economic Community, providing technical assistance to enhance trade preferences and economic integration.

In Vietnam, the British Council continuously supports independent art organisations with funding, workshops, and residency programs. These efforts help shape Vietnam's cultural industry by promoting traditional cultural values and boosting sustainable development. The collaboration between the Vietnamese Ministry of Culture, Sports, and Tourism and the British Council in Vietnam further solidifies these ties.

Global partnerships are vital for introducing new ideas, technologies, and creative approaches. Although collaborations with the UK provide significant advantages, such as access to advanced practices and resources, challenges persist. For example, Myanmar's involvement in creative technology is limited due to a focus on humanitarian support, while UK aid to Lao PDR emphasises language skills over creative infrastructure. In Malaysia, while connections exist, they lack formal agreements on creative technology. Other partnerships tend to be 'one offs' and less focused on interdisciplinarity and contemporary art practices.

Stakeholder mapping

In this section, we map the relevant stakeholder groups that are crucial for the continued development of ASEAN's creative technology. The ecosystem can be understood through categories loosely based on the pentahelix innovation model. The pentahelix model, traditionally used to describe the interplay between five key sectors — **Government, Academia, Industry, Civil Society, and Media** —provides a comprehensive framework for understanding innovation ecosystems. It emphasises the importance of collaboration across sectors to drive sustainable development and innovation.

The pentahelix model has been adapted to better reflect the unique dynamics in the region. As such it has replaced **Media** with **Cultural and creative spaces**. The change highlights the importance of both physical and virtual environments where art is created, displayed, and interacted with. It also acknowledges the critical role spaces play in providing platforms for artistic experimentation and public engagement. **Media** has been integrated within the **Cultural and creative spaces** and **Creative tech startups and companies** categories, acknowledging its role in both content creation and dissemination, as well as in facilitating interactions between creators and audiences.
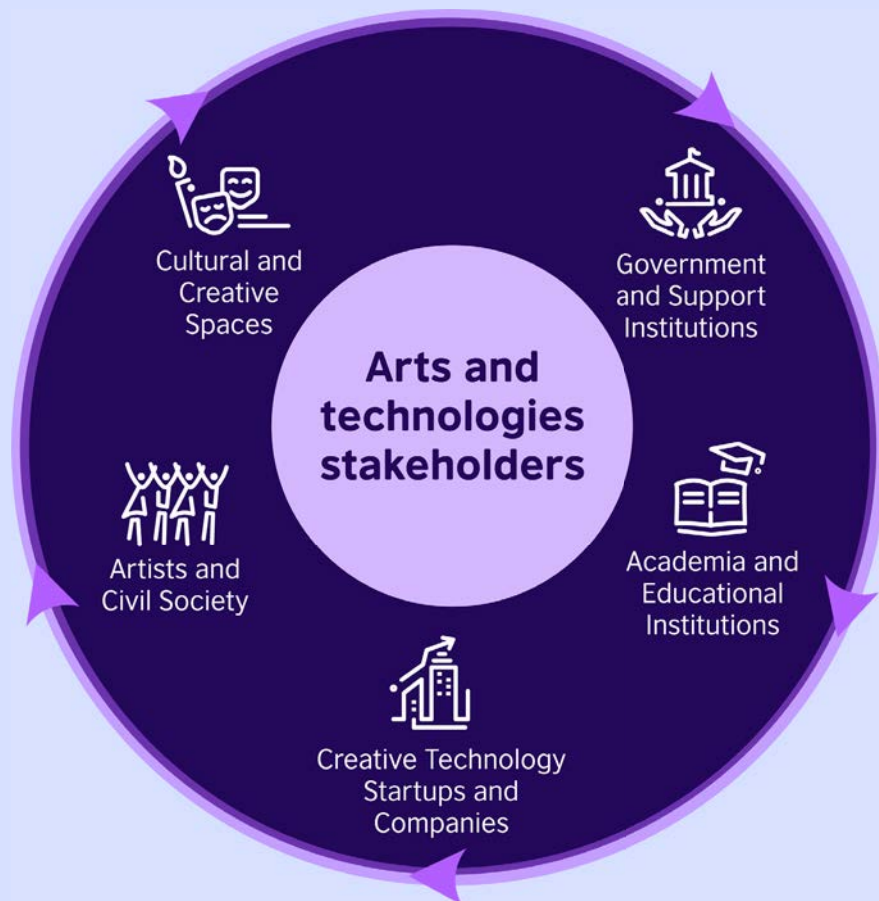
The five stakeholder groups include: (1) Government and support institutions (2) Academia and educational institutions (3) Creative tech startups and companies (4) Artists and civil society and (5) Cultural and creative spaces.

Government and support institutions. Government bodies, support institutions, and funders shape policies that encourage innovation, protect intellectual property, and ensure the sustainability of creative projects. They play a role in setting standards and regulations that govern the use of technology in the arts. They typically involve a mix of middle-aged to senior professionals:

National and local government agencies: Cultural ministries, economic development boards, and city councils.

International organisations: British Council, UNESCO, ASEAN Secretariat, and World Bank.

Non-profit funding bodies: National Arts Councils, local and national government grants, and private foundations.

For-profit funders: Accelerators, Incubators, Venture capitalists, banks.

Academia and educational institutions. Universities, colleges, and research centres are pivotal in providing the education, training, and research necessary for the growth of creative technologies. This group is diverse, encompassing young students and professionals to seasoned academics and researchers. Stakeholders are aware of the need to strengthen gender diversity, particularly the number of women in STEM and creative fields. Key entities include:

Universities and colleges: Institutions like Institut Teknologi Bandung (ITB) in Indonesia, and Nanyang Technological University in Singapore.

Research centres: Dedicated centres for digital media and creative technologies.

Non-formal educational entities: Workshops, community-led initiatives, and online courses.

Collaborative programs: Partnerships with global institutions like the Royal College of Art and MIT Media Lab.

Creative tech startups and companies. They range from small startups focused on niche markets to large tech firms that provide comprehensive solutions for the creative sector. They often attract participation from young entrepreneurs and innovators. Startups are at the forefront of integrating technology with creative processes. Their relevance lies in driving technological advancements, creating new tools for artists, and opening up new possibilities for artistic expression:

Startups: Newly founded companies focused on bringing innovative products or services to market within digital art, animation, and interactive media.

Tech giants: Global firms like Google, Adobe, and Microsoft offering software and platforms

Digital marketplaces: Platforms like Etsy, Saatchi Art, and Artsy.

Media platforms: Social media platforms, content creation platforms, and streaming services that allow artists to share their work and engage with audiences.

Artists and civil society. Artists, collectives, and non-profit organisations form the core of the arts and creative tech ecosystem. They are the primary users and innovators of creative technologies. Civil society organisations provide resources, platforms for collaboration, and opportunities for public engagement. Artists range from young emerging talents to experienced professionals.

Individual artists and collectives: Independent artists, artist-run spaces, creative collectives.

Non-profit organisations: NGOs, advocacy groups, and community arts organisations.

Professional associations: Groups that support artists' rights and provide professional development.

Cultural and creative spaces. They play a key role in preserving cultural heritage and providing platforms for traditional and contemporary art forms to coexist and evolve. Importantly, they bring together different sectors such as information, communications and technology (ICT) R&D, science, and more, facilitating interdisciplinary collaboration and innovation. They are often managed by a mix of young professionals, curators, entrepreneurs, engineers, programme managers and artistic directors:

Physical spaces: Galleries, museums, cultural centres, and maker spaces.

Digital spaces: Online platforms, virtual galleries, and social media.

Creative hubs: Spaces that provide resources and networks for creative professionals.

Hybrid spaces: Many cultural and creative spaces now offer hybrid activities, transitioning from physical to virtual at different stages to maximise reach and engagement.

Policy coordination and support mechanisms

This section delves into the analysis of policies and support mechanisms that coordinate the growth of creative technologies and give equitable opportunities to women and marginalised groups. By examining them, we gain insight into how ASEAN countries give meaning, value and prioritise creative technology within specific contexts. The analysis is organised to provide a comprehensive understanding of the varying levels of policy development, the effectiveness of support systems, and opportunities for enhancing collaboration and innovation.

IP policy analysis

Intellectual property (IP) is critical for creative technologies on a worldwide scale because it protects breakthroughs, encourages investment, and ensures artists receive monetary compensation for their original ideas. During the Covid-19 pandemic, there was a global surge in creating and consuming content. Big western studios would invest in IP in Asia, bringing bigger budgets and cutting edge technology to creative content practices in the region. Encouraged by revenue from streaming platforms, there was a surge in "content creators," or individuals or microstudios, who would put together short-form content to be played on platforms like Instagram, Facebook, TikTok, and the like.

IP regulations stimulate content production by protecting rights, encouraging innovation, and boosting competition. International accords, such as the TRIPS Agreement, standardise intellectual property regulations, allowing worldwide trade and collaboration (World Trade Organisation, 2023).

Strong IP frameworks support economic growth, attract foreign investment, and drive digital transformation. Policies like the ASEAN Intellectual Property Rights Action Plan promote cooperation, IP enforcement, and capacity building, crucial for sustaining creative industries and boosting innovation (ASEAN, 2022).

Despite this, ASEAN shows varying levels of IP development in its respective creative sectors. It is heavily influenced by national policies, ease of access to technology, and the robustness of creative intellectual property policy frameworks in each respective territory. Countries with stronger policy support and effective IP protection, such as Singapore and Malaysia, tend to have more developed creative sectors. In contrast, nations like Lao PDR and Myanmar are still building the necessary infrastructure and legislative support to foster their creative economies. The countries with more developed creative sectors also reflected easier access to current digital and creative technology as compared to countries that are still nurturing their creative sectors. This is also seen in the level of investment, international cooperation and trade, and protection of creator's rights in each country (UK IPO, 2023; ASEAN, 2022).

Intellectual property regulation also varies. Countries such as Singapore and Malaysia have effective enforcement. Other nations, such as Lao PDR and Timor-Leste, are still working on improving their intellectual property frameworks to meet international norms. Countries like Brunei Darussalam, the Philippines, and Vietnam have been actively aligning their policies with WIPO and other international policies, while at the same time improving IP enforcement. Overall, the region is making tremendous progress in enhancing intellectual property protection in order to promote innovation and creative sectors.

Summary of ASEAN IP policy

Brunei Darussalam	Managed by the Brunei Intellectual Property Office (BruIPO), which promotes innovation and protects creative works. Brunei has developed a robust IP framework to support its modernising creative industries.
Cambodia	Governed by the 2003 law on Copyright and Related Rights. This law forms the backbone of IP protection, although enforcement remains a challenge, with ongoing efforts to strengthen the IP regime.
Indonesia	A comprehensive framework has been developed to support the protection of creative works. The Indonesian government actively promotes IP rights to encourage innovation and creativity.
Lao PDR	Recent reforms aim to align IP laws with international standards. Before becoming a WTO member, Lao PDR faced significant IP challenges, but improvements are being made to enhance enforcement.
Malaysia	The Malaysian Intellectual Property Corporation (MyIPO) manages IP protection. Malaysia has a well-developed IP framework that supports innovation and creative industries, with ongoing efforts to improve enforcement and protection.
Myanmar	The IP framework is evolving, with recent legislative reforms to improve protection and enforcement. Myanmar is working towards better alignment with international IP standards.
Philippines	The Intellectual Property Office of the Philippines (IPOPHL) ensures robust IP protection. The Philippines has a strong IP framework, which supports its vibrant creative industries.
Singapore	Singapore has a world-class IP framework, with strong enforcement and support for creative industries. The Intellectual Property Office of Singapore (IPOS) plays a crucial role in promoting innovation and protecting IP rights.
Thailand	Managed by the Department of Intellectual Property (DIP), which provides comprehensive IP services. Thailand has made significant strides in improving its IP laws and enforcement to support creative industries.
Timor-Leste	The IP framework is developing, with efforts to align with international standards. Timor-Leste is working towards better protection and enforcement of IP rights to support its emerging creative sectors.
Vietnam	Recent improvements in IP laws aim to provide better protection for creative works. Vietnam is focused on aligning its IP framework with international standards and enhancing enforcement mechanisms.

Funding support for arts and technologies

In the midst of technological advancements, a constant hurdle that creative professionals face is the lack of financial support. Practitioners often find themselves shelling out of pocket to finance their passions and endeavours, while more organised entities look for investment and bridge funding. We have identified five funding mechanisms that could make a significant impact in the further development of creative technology in the region. They are not exclusively for arts and technologies in the region. They are not exclusively for these sectors but could potentially support relevant initiatives:

Government grants and subsidies

Several ASEAN nations offer grants and subsidies to promote creative technology. For example, Singapore's Infocomm Media Development Authority (IMDA) provides money through programmes such as the Media Development Grant (IMDA, 2023).

Private sector investment

Private investors and venture capital firms are active in the region, backing startups and innovative technology projects. Notable investors include Golden Gate Ventures and Gobi Partners, which make significant investments in ASEAN's tech economy (Golden Gate Ventures, 2023; Gobi Partners, 2023).

International organisations

Institutions like the World Bank and the Asian Development Bank (ADB) sponsor technology and innovation projects, including those in the creative sector (World Bank, 2023; ADB, 2023).

Non-governmental organisations (NGOs) and foundations

NGOs and foundations, such as the ASEAN Foundation, provide grants and support for creative projects that foster cultural interchange and innovation (ASEAN Foundation, 2023).

Corporate sponsorships and partnerships

Corporations frequently participate in sponsorships and collaborations to encourage creative technology initiatives. Companies such as Google and Microsoft have programmes that offer financial assistance and resources to ASEAN tech entrepreneurs (Google, 2023; Microsoft, 2023).

Gender & marginalised community support

Workshop led by Khatriza Ahmad Saffian, Khatriza Ahmad Saffian, Senior Lecturer at Universiti Technology MARA, Malaysia.

Our findings reveal that despite progress in policy and practice, gender disparities in accessing education and technology remain. For example, in several ASEAN nations, cultural norms and socioeconomic constraints prevent girls from pursuing higher education and technology (UNESCO, 2023). The gender ratio in creative, technology, and creative technology courses differs by ASEAN country. In Indonesia, women account for roughly 38% of students in technology-related fields, whereas in Singapore, women account for approximately 45% of the cohort in equivalent courses. The greatest gender difference is found in Cambodia, where women account for only 25% of students in these professions, whereas the Philippines has a more equal ratio, with women

accounting for 48% of the student population in technological courses. However, there is limited data on the number of students from marginalised backgrounds enrolled in creative technology courses. Reports show that marginalised groups, such as ethnic minorities and low-income students, suffer major impediments to higher education in the technical professions (UN Women, 2023; ASEAN, 2023).

Marginalised groups in ASEAN countries face significant challenges, despite various initiatives aimed at promoting gender equality and supporting underrepresented communities. For instance, while Brunei Darussalam has made strides in gender equality through initiatives like the Wawasan Brunei

2035 and the National Plan of Action on Women, there remain gaps in support for women-owned businesses. Similarly, in Lao PDR, despite high female labour force participation, many women still occupy unpaid or low-control positions, highlighting a persistent gender divide. Malaysia, with its conservative social norms, also sees women underrepresented in professional sectors, particularly in fields like engineering, despite high educational attainment. In Myanmar, traditional gender roles and limited access to technology significantly hinder women's participation in the tech sector. Across the region, there is a need for more inclusive policies and programmes that not only address gender disparities but empower marginalised groups, ensuring they have equitable opportunities to contribute to and benefit from economic and social development.

There are several funding programmes identified for women and marginalised communities in ASEAN:

Women in Technology (WiT) Fund, Singapore

The Infocomm Media Development Authority (IMDA) leads this initiative, which aims to help women pursue jobs in technology, including creative technology. It provides grants and scholarships to enable them to further studies in technology (IMDA, 2023).

ASEAN Women Entrepreneurs' Network (AWEN)

AWEN provides funding and support to female entrepreneurs in a variety of fields, including creative technology. It focuses on empowering women by providing capacity building, mentorship,

and financial resources (AWEN, 2023).

Microsoft Philanthropies

Microsoft offers a variety of programmes aimed at ASEAN's marginalised communities. Initiatives include grants and training programmes for women and marginalised communities to improve digital literacy and creative technology skills (Microsoft Philanthropies, 2023).

Google for Startups' Women Founders

This programme provides funding, resources, and mentorship exclusively for female-led entrepreneurs, particularly those in creative technology. It seeks to address the gender gap in the technology industry by financial and strategic support (Google, 2023).

ASEAN Foundation's Empowering Women for Sustainable Development Programme

This initiative offers money and training to women and marginalised populations to help them improve their abilities in creative and digital technology. The programme aims to promote sustainable development by empowering women in many technological disciplines (ASEAN Foundation, 2023).

She Loves Technology: Global Startup Competition

This yearly competition is for tech firms founded or co-founded by women.
It provides entrepreneurs with capital, mentorship, and networking opportunities to help expand enterprises in the creative technology sector (She Loves Tech, 2023).

Recommendations

The recommendations aim to align with the objectives of the British Council and Foreign Commonwealth Development Offices (FCDO) in ASEAN countries. The British Council's ASEAN-UK Advancing Creative Economy Initiative aims to strengthen the creative economy of ASEAN member states through collaboration with the UK, focusing on professional development, knowledge exchange, and building networks of policymakers and creative practitioners in both regions. Simultaneously, the FCDO's UK Mission to ASEAN aims to deepen engagement, building on existing political-security, economic and socio-cultural collaboration. Based on these objectives and our findings, we recommend the following strategic actions below.

Pushing artistic innovations

In partnership with cultural institutions, creative spaces, and art funds, the British Council can commission flagship creative technology works. These will aim to expand the discourse on the evolving nature of art in the digital age and its profound impact on society. These showcases can provoke thoughtful dialogue, inspire audiences and broaden understanding of creative technology's role in shaping future societies.

Fostering digital literacy and skills development

In partnership with educational platforms, community organisations and creative hubs, the British Council can support projects that enhance digital literacy and skills across ASEAN, particularly for women and marginalised artist groups. By leveraging the UK's resources and expertise, the British Council can assist in creating workshops, online courses, and certification programmes in areas like coding, digital content creation, and creative technologies such as VR and AR. These initiatives can empower creative professionals and promote inclusion in the digital economy.

Empowering creative hubs and incubators

The British Council can support hubs where creativity and technology meet. Hubs make an impact by supporting the professional development of creative professionals, advocating for inclusion, and fostering the growth of creative enterprises. They also provide tools like 3D printers, digital fabrication labs, and animation software. The British Council can also boost these hubs by supporting networking and pitching events, offering professional development opportunities for hub leaders—similar to the Creative Hubs for Good project—and providing grants for arts and technology initiatives.

Enhancing interdisciplinarity

Promoting interdisciplinary R&D projects that integrate art, science, and technology will drive innovative solutions to contemporary issues. In partnership with higher education institutions (HEIs) from the UK or ASEAN, the British Council can initiate and support collaborations that drive innovation in creative technology. HEIs play a key role by leading research and development (R&D) that connects the academe, industry and creative talent. Supporting projects in scoping, prototyping, market testing, and finding collaborators can ensure their success and can potentially bridge funding gaps. This approach not only builds local strengths but also positions UK and ASEAN institutions as global leaders in innovation.

Strengthening IP protection and legal support

The British Council can partner with local governments and international organisations to enhance IP laws and enforcement across ASEAN. By offering workshops on IP rights, copyright issues, and the business aspects of IP, creatives can better protect and value their work. Collaborating on a regional festival that showcases creative products and policy innovations in IP protection can further highlight the importance of IP in the creative economy. Leveraging the UK's strong legal framework, the British Council can guide these efforts, ensuring creatives are protected and can confidently innovate and collaborate internationally.

In addition, partnering with organisations like WIPO to upskill agencies and collective management organisations (CMOs) across ASEAN can improve enforcement and help artists maximise revenue streams. The British Council can work with local IP-focused agencies, such as IPOS and IPOPHL, to develop stronger advocacy and educational materials. A conference involving ASEAN government agencies, industry organisations, CMOs, and creators, with UK thought leaders, can address emerging global IP issues.

To further support IP development, the British Council can explore offering ASEAN-specific grants to help creators understand the monetary value of their IP. A potential programme could involve an ASEAN partnership to co-produce a large IP project spanning multiple media platforms, providing hands-on experience in IP management. Additionally, partnering with national IP programmes like the Philippine International Copyright Summit and Singapore IP Week can strengthen IP practices in the region.

Finally, establishing a policy lab that connects artists with policymakers to discuss IP ethics, particularly around GenAI, can help shape future frameworks.

Encouraging sustainable and socially impactful projects

In partnership with other international organisations, technology companies and climate-focused organisations, the British Council can fund initiatives that use technology for environmental and cultural preservation. For instance, projects that use VR to document and preserve endangered cultural practices or blockchain to ensure the provenance of sustainable art materials. Supporting projects focused on sustainability, cultural preservation, and social impact aligns with global sustainable development goals and enhances the relevance of creative projects.

Promoting equitable market access

Working with emerging artists and creative entrepreneurs, the British Council can facilitate access to new markets, audiences and collaborators. This can be done through networking, residencies, conferences and exhibitions. For example, organising cultural exchange programmes that allow ASEAN artists to exhibit their work in the UK and vice versa. Such initiatives can significantly boost livelihood opportunities for creative people while fostering cultural links and understanding.

Conclusion

Summary of key findings

ASEAN's arts and technologies have been a catalyst for transformation, enabling new forms of expression while reinterpreting traditional practices. The region's rich cultural heritage, coupled with the rapid digital advancement, has created an environment conducive to new business models, practices, and artistic expressions. Government support has been instrumental in nurturing this ecosystem, providing critical funding and infrastructure that have allowed initiatives to flourish.

A notable finding in this report is the evolving role of artists who are leveraging technology to push boundaries. Technologies such as AI, AR, and VR are not only tools but mediums through which artists can explore new narratives, create immersive experiences, and engage audiences in novel ways.

However, significant challenges remain. The digital divide continues to be a major barrier, limiting access to technology and the internet, particularly for marginalised groups. Resource constraints, including limited funding and technological infrastructure, hinder the growth of creative projects, while political instability and fragmented initiatives pose risks to sustainability and collaboration. Additionally, issues such as intellectual property protection, big tech monopolisation and regulatory inconsistencies across ASEAN countries complicate ecosystem development.

Despite these challenges, arts and technology intersections in ASEAN are promising. Interdisciplinary collaborations, the adoption of emerging technologies, and expansion of creative hubs and incubators can foster value creation. Moreover, there is a growing emphasis on sustainability and social impact, providing a platform for artists to contribute meaningfully to addressing environmental and societal challenges.

As ASEAN continues to navigate these complexities, the intersection of art and culture, creativity, and technology will remain central to rapid developments. The region's ability to understand and harness these dynamics will determine its future success in the global creative economy.

Implications for the British Council and key stakeholders

Findings from this report have several implications for the British Council and other stakeholders in the creative economy. Firstly, there is a clear need to bridge the digital divide and provide equitable access to technology and the internet across ASEAN. The British Council can promote programmes on digital literacy for marginalised artist groups to ensure they have the resources and knowledge to engage with creative technologies.

Secondly, through this research project, the team realised the weak links existing between technologists and artists. Strengthening these ties through collaborative opportunities from the British Council could prove useful in responding to the digital divide.

Additionally, the British Council can have a unique role to play in offering alternatives to traditional economic growth models in the creative industries. Supporting the development of creative hubs and incubators can nurture new talent and provide a platform for innovative projects.

Through these initiatives, stakeholders can contribute to a future that is – as was mentioned in the Introduction – inclusive, sustainable, and playful.

Acknowledgement

The research team would like to thank all interviewees for their time and valuable insights:

About Creative Friction Ltd

Creative Friction Ltd is a London-based company focused on research and consulting services. Our team has its roots at the University of Oxford, Central Saint Martins, Cambridge, and UCL along with other institutions and companies that are not only shaping cities in the UK, but also around the world. Having worked with top innovation funds such as Sitra, cultural organisations such as the British Council, impact makers such as the Global Thinkers Forum and the World Economic Forum, accelerators such as Startupbootcamp IoT, and a range of workspace companies, we have become experts in helping our clients deliver exceptional value. Creative Friction believes in the power of creative interactions to foster innovative spaces and value. Through our data-driven methodology, we are able to consult in sustainability, innovation, and co-design areas to help organisations understand, evidence and enhance the creative value they are generating.

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Appendix

Appendix A: Methodology

Detailed research questions (continued from Introduction chapter)

The research questions mentioned in the Introduction section are based on the more detailed questions below:

Research question 1	What are the key characteristics of the focal arts and creative practices intersections of interest in each country included in our study?
Research question 2	How have these intersections evolved over the past decade? What factors, including notable projects, spaces, events, domains, actors, have affected their development and at which specific points in time? What have been the key challenges?
Research question 3	What do our in-depth case studies reveal about how art, culture, and creative practices are driving innovation and shaping perceptions of technology in each country? How have these case studies influenced the arts and creative practices intersections?
Research question 4	How do ecosystem-level factors, such as policy frameworks and infrastructure, support or constrain the development of creative technology?
Research question 5:	How can specific arts and creative practices intersections be effectively supported and nurtured through policy, investment, networks, and international exchange (e.g., with ASEAN/UK) from 2025 to 2030? How can support be targeted to strengthen the transformative role of arts and creative practices in relation to rapid, narrowly defined, and configured technological innovation?
Research question 6	What do we know about how generative artificial intelligence (GenAI) is being adopted, adapted, questioned, and transformed by creative practitioners from diverse backgrounds since 2020 when OpenAI made it accessible to the general public? Is the work of artists and other creative practitioners impacting broader artificial intelligence (AI) trends in each country or notable communities within it, for instance, by making alternative visions and technologies known to the public?

Data analysis methods

We employed various analytical approaches:

1. Thematic analysis to identify recurring patterns related to the use of creative technology and its cultural impact. This method helped in categorising and interpreting qualitative data, allowing us to draw meaningful insights from diverse sources such as interviews and desk research.

2. Timeline mapping to understand the evolution and dynamics of creative technology adoption, highlighting key events, influential factors, and ecosystem dynamics. This chronological approach provided a clear view of how discussions and adoption patterns have shifted over time, especially before, during, and after the pandemic.

3. Ecosystem analysis to examine how creative production is being transformed by emerging trends, such as GenAI, and to analyse the conditions within an ecosystem that lead to creative and technological advancements. This involved examining how various stages of the cultural cycle are being influenced by new technologies.

Appendix B: Country deep dives

Detailed findings for the 11 countries can be found as a separate file, Appendix B: Country deep dives.

Appendix C: Policy frameworks

A comprehensive overview of relevant policies can be found in another separate file, Appendix C: Policy frameworks.

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