



Chapter III

Digitalization and artificial intelligence in the creative economy



Digitalization and artificial intelligence in the creative economy

The chapter examines how creative industries adopted digitalization and artificial intelligence and how this is transforming the creative economy. Creative products are produced, distributed and consumed differently in a digital world powered by artificial intelligence. In this context, creative work can be more cost-efficient and reach a wider audience. This new reality entails essential policy challenges and responses in the creative economy. For example, these technologies raise concerns about quality, appropriation, copyright protection and compensation, homogenisation, privacy, consumer and data protection, and monopolisation of content. These challenges are a development issue, including the fact that several developing countries are lagging due to gaps in infrastructure, digital environment, skills, research and development capabilities, and regulations.

Policymakers must continuously adapt policy and regulatory frameworks to seize opportunities and mitigate risks associated with the digitalization and use of artificial intelligence in the creative economy. Key areas of focus include enhancing quality and consumer welfare through human oversight of artificial intelligence and ensuring algorithmic transparency to maintain, among other things, cultural diversity. Priorities also include updating intellectual property rights, especially copyright frameworks, to address digital challenges, including raising digital literacy and tackling digital piracy, which significantly impacts revenues. Additionally, digital transformation requires adequate skills, highlighting the need for comprehensive education and training with an interdisciplinary approach and preparing for continuous change, contract protection and social support policies. These should come alongside efforts to bridge development asymmetries and digital divides, ensuring equitable access to and use of technology. International cooperation can play a crucial role in all these policy

strategies. Market concentration and competition policy are important topics for digital creative services and are discussed in detail in Chapter IV of this report.

A. “We are not in Kansas anymore”

The phrase “We are not in Kansas anymore”, famously uttered by Dorothy in the movie “The Wizard of Oz” upon her arrival in the magical Land of Oz, symbolises a transition into an unfamiliar, transformative world. This sentiment aptly captures how digitalization and artificial intelligence have ushered the world, including creative industries, into a revolutionary era far removed from conventional experiences.

Industries in the creative economy use digital tools and artificial intelligence to improve cost efficiency and reach more clients. The digitalization of creative industries transformed how content such as books, films, music, video games, and others are created, distributed, and



consumed. Players in creative industries have been among the fastest to adopt digital technologies, impacting their business models (UNESCO Institute for Statistics, 2016). The opportunities provided by digitalization include:

- In producing content, having affordable digital tools lowers entry barriers and allows individual creators to innovate collaboratively (UNCTAD, 2022b).
- In distributing content, some websites and platforms allow artists to reach global audiences.⁶
- Streaming technology has shifted the way users behave when consuming content. Users have moved from ownership to access. In the music industry, users move from purchasing albums or songs to monthly subscribing to access music (International Trade Centre, 2019).

Digitalization reduces costs in creative industries through efficiency and

can improve their revenues through product and process innovation, wider reach to audiences and new business models. Developing countries can use these opportunities to enhance the competitiveness of their creative industries and further integrate them into regional and global value chains.

Furthermore, creative industries apply artificial intelligence in various forms throughout the entire value chain of producing, distributing and consuming creative content (European Commission, 2022). Anantrasirichai and Bull (Anantrasirichai and Bull, 2022) grouped examples of using artificial intelligence in creative industries into five broad categories: creating content, enhancing content and post-production workflows, extracting and improving information, compressing data and analysing information (see Box 2). There are additional opportunities in distribution and consumption as well.



Box 2

Using artificial intelligence in the creative economy

Creating content includes generating scripts and movies, journalistic texts, music, images, captions, animations, and virtual reality content. An artificial intelligence machine created the script for a short science fiction movie, in 2016. In collaboration with humans, the same artificial intelligence was used to create selected areas of the sequel, in 2017.⁷ The first movie had some unnatural storylines, while the sequel was more fluid, confirming that current technology works better in conjunction with people. Automated journalism uses computational techniques to generate news articles by scanning large amounts of data, ordering key points and inserting details such as names, places, statistics and figures. BBC already reported on the general election in the United Kingdom of Great Britain and Northern Ireland in 2019 using automated journalism. In music, artificial intelligence algorithms analyse data to find musical patterns to suggest composed melodies that may inspire artists. A software launched a song in the style of The Beatles in 2016 and the first artificial intelligence album in 2018.

Some applications can produce images based on input images, learning the mapping of the input and applying convolution layers. For example, algorithms can transform images of faces to add age or change attributes such as hair colour. These applications can also interpret images and videos and automatically generate captions through object recognition. Artificial intelligence is also used for animation, where static images are modelled to create moving images. Learning models of artificial intelligence can capture actual motion sequences, even based on several static scenes, and apply motion prediction abilities to animate characters. Artificial intelligence already made a video of the Mona Lisa speaking. Augmented and virtual reality are computer technologies that create a different

⁶ This is the case of YouTube in the case of audio-visual products (International Trade Centre, 2019).

⁷ The first movie is "Sunspring", and the sequel is "It's no Game".



environment. Augmented reality adds digital layers to the physical world, and virtual reality creates an immersive experience through a fully simulated environment. Augmented reality can expand experiences in movies and theatres, and virtual reality is used in health services for surgical simulations and physical therapy.

Extracting and enhancing information includes segmenting and recognising content, detecting and tracking salient objects, combining images, and producing three-dimensional content by reconstructing and rendering. Artificial intelligence methods based on deep learning apply convolutional layers, efficiently performing statistical analysis and extracting information from the signal. This enhances and transforms the signal, making images more readily interpretable or transforming real actions into animations.

Enhancing content and post-production workflows includes improving contrast, colouring, upscaling imagery, restoring content or adding visual special effects. Some methods increase the differences in luminance or colour, i.e. the contrast. These differences make objects distinguishable, avoid flat or dull appearance and trigger reactions in people's visual systems. The colouring adds or restores colour by adding convolutional layers of colours to the grayscale and applying filters to obtain natural colours. This can transform black-and-white content or restore colour to aged films.

Artificial intelligence methods increase the resolution of images and videos. For example, successive video frames can generate a single high-resolution frame. Upscaling imagery became popular, for example, to convert legacy content to be compatible with modern formats. Deep learning techniques, such as deblurring, denoising or dehazing, have been used to restore content. Improving the signal quality is essential for creative activities, addressing distortion or damages caused by environmental conditions, sensor characteristics or medium ageing. The creative economy uses techniques that enhance content to add visual special effects, a type of enhanced animation. Movies can combine physics models with algorithms to create three-dimensional animations. Head-mounted cameras and facial tracking markers can transform actors' faces into characters.⁸

Compressing data, including audio and video, improves quality and user experience. Furthermore, several creative activities demand increasing the quality and quantity of visual content, more immersive experiences, and greater interactivity, all for increased user numbers. Compressing data, notably video, is necessary to reconcile this demand with available network capacity. Artificial intelligence can achieve consistently better compressing results than conventional approaches.

Analysing information comprises categorising texts, retrieving and analysing content, and providing recommendations and intelligent assistant services. Categorising texts builds on generating summarised texts from full texts. The summaries can index documents for subsequent content retrieval and analysis to detect spam, classify topics and give predictions. Content retrieval is important to facilitate the research often needed in creative activities. Artificial intelligence can recognise audio and objects to analyse the media and build on automatic annotations that categorise and retrieve content. Images are retrieved based on several features such as points, lines, shapes and colours. Music is also retrieved based on features extracted from sound.

Learning systems can assess what people look online, how long they spend browsing ads, and overall online behaviour and preferences. This allows to target ads and to inform how and when to show ads. Analysing content also allows one to match content to audiences, for example, recommending music or movies. Recommendation engines suggest products based on data analysis. These include curator tools that search large databases to create shortlists, such as song playlists, to save time and connect to audiences. Intelligent assistants are software tools that build on the ability to analyse information to answer queries related to news or weather, recommend songs, movies or directions, or manage schedules and emails.

Source: Anantrasirichai and Bull, 2022.

⁸ See for example the "Avengers Endgame".



B. Use of artificial intelligence by different creative industries

Advertising uses artificial intelligence widely, mainly to increase the efficiency of gathering, analysing, and sorting vast amounts of data. Some marketers use data to spot trends and make advertising decisions. For example, an artificial intelligence platform generates multiple advertisements automatically based on the marketer's specific goals. The algorithms conduct tests on potential ads and choose those deemed most effective. This called for extensive investment in expanding computing power to train more intricate artificial intelligence models on larger datasets. This allowed to generate numerous ad variations, evaluate their resonance with audiences, and saturate the market with the variants demonstrating the best performance. Reports from advertisers note that this platform enhances the performance of advertising campaigns (*Financial Times*, 2023a).

Architecture increasingly uses artificial intelligence to address many concerns related to aesthetics, building regulations, structural efficiency, socioeconomic context, and cultural environment. This support can be given at several stages, from planning and design to construction and maintenance.

Artificial intelligence can feed architecture research and planning by processing data to support topology optimisation and urban planning while considering regulatory compliance, solar radiation predictions, and other criteria (As and Basu, 2021).

The design processes build on artificial intelligence at all stages, including design analysis, ideation and iteration with user feedback. Data processing abilities are important for design analysis, for example, by reviewing prior architectural design knowledge and other information that helps design choices promote well-being in people. This information should cover neuroscience data on the behaviour of

users, historical and aesthetic solutions for a given socio-economic and cultural context, notions of heritage, and information on relationships with the territory. Data analytics is of particular interest to enable smart building technologies for sustainability.

Artificial intelligence can assist the ideation stage of architectural design by providing out-of-the-box scenarios that stimulate architects' creativity. Those algorithms can also automatically generate multiple design solutions to an architecture problem (As and Basu, 2021). At the design iteration stage, artificial intelligence can improve accuracy, increase efficiency, and tailor solutions to a client.

Artificial intelligence can also facilitate the production process by optimising aspects of fabrication, structure, and so on, relying on robot fabrication. Artificial intelligence tools support maintenance by analysing video feeds and detecting weaknesses and errors that require preventive or corrective maintenance.

Artificial intelligence has a role to play in several aspects of **arts and crafts**. In the crafts industry, algorithms can assist production in design. People transition to design, maintenance, and programming roles as machines gradually take over routine tasks. This collaborative approach enhances efficiency in the sector, allowing machines to handle repetitive and challenging tasks (Eskak and Salma, 2021). People can also do digital crafting using generative artificial intelligence. Many people use these technologies to share pictures, ideas, and tips to get certain prompts.

Artificial intelligence can facilitate the development of virtual art galleries and exhibitions in the arts. Artists leverage artificial intelligence to craft immersive digital showcases that are accessible globally, making art more widely available. Notably, some of the most innovative artificial intelligence -based art projects are in Africa. For instance, a Nigerian artist employs artificial intelligence algorithms in a multimedia installation that



generates images and sounds based on visitor movements. Similarly, a Kenyan artist combines similar algorithms with traditional painting techniques to create unique digital portraits exploring identity

and representation in contemporary African art (Faster Capital, 2023).

Artificial intelligence creates opportunities for women creative entrepreneurs to grow their businesses, for example, in the arts, crafts, fashion, and gaming industries (see Box 3).



Box 3

The role of e-commerce and artificial intelligence in empowering female creative entrepreneurs

UNCTAD eTrade for Women initiative empowers women entrepreneurs in e-commerce and the digital economy. This initiative was designed to bridge the digital gender gap. It has facilitated the growth of women-owned businesses by providing training, knowledge-sharing and networking opportunities, including for several women in the creative industries. The following profiles showcase experiences of women entrepreneurs navigating challenges and opportunities in the digitalization of creative industries and the use of artificial intelligence.

Female creative entrepreneurs

Co-founder and chief technology officer (CTO) of Mawua Africa in Kenya, Pauline Kariuki, has a technology background and connects over 800 East African artisans in creative industries with international markets. The marketplace is for artisanal crafts, bags, jewellery, and decoration goods. The company aims to address the disparity between high-level creative skills and the lack of business and digital skills among artisans. The company processes international shipping for the artisans from an order fulfilment centre. Still, the marketplace faces important challenges with international shipping, particularly in forecasting tariff rates and navigating diverse customs procedures. Another challenge is the lack of adequate physical and digital infrastructure essential to run e-commerce. The company sees an opportunity in the use of artificial intelligence, especially in developing detailed product descriptions and personalising the shopping experience on its website.

Founder of Epica Jewellery in Kenya, Sharon Wendo embarked on her e-commerce journey in 2020, leveraging the power of online sales during the COVID-19 era. The company's exclusive online sales model, heavily reliant on social media platforms has proven successful in enhancing the company's visibility and sales. However, challenges persist, notably with high customs duties in certain foreign markets. Sharon uses both creative and business skills in her work, relying on platforms and online classes to acquire these skills. She also has to address challenges such as limited access to finance, gap between talent and formal education, high taxes, and dependence on local suppliers. The company uses artificial intelligence apps that aid in design precision and waste reduction.

As the managing director of Idozi Collective, a clothing company based in Lagos, Nigeria, Blessing Ebere Achu emphasises the importance of an online presence through social media and e-commerce platforms. The company uses different technologies to manage inventory and engage with customers efficiently. The main challenges for the company include water scarcity, lack of electricity, limited access to finance, lack of trust in international online payments, challenges in human resources, and copyright issues. This managing director underscores the significance of leadership skills and participation in entrepreneurship and mentoring programmes. The company successfully integrates artificial intelligence into its services, using artificial intelligent apps for design inspiration, mood boards and storytelling.

Founder of Warrd, a company specialising in developing educational apps, games, and animations, Ayah Elarief shares insights into the challenges and achievements of her tech-focused venture in Egypt. This firm's game-based educational platform impacted 120 schools and over 30,000 students, improving learning experiences in various subjects such as Arabic, French, and mathematics. The platform has received appreciation from ministries of education and has exported games to Côte



d'Ivoire, France, Nigeria, Saudi Arabia, and Senegal. Ayah emphasises the importance of effective communication, personal branding, networking and soft skills for success. Challenges include a lack of support for start-ups in Egypt, an unfavourable legal environment (to register patterns, for example), fluctuations in currency rate and societal biases for women in business, especially when pregnant or with small children. The firm actively incorporates artificial intelligence into game development to enhance educational outcomes by adjusting the games to the student's level.

Founder of Annada, a company selling high-end scarves, clothes and bags in Bahrain, Nada Alawi highlights the challenges faced in e-commerce. Restricted access to a social media platform shop option in Bahrain poses difficulties, impacting the company's ability to leverage its significant social media audience for online sales. The company contacts sales primarily in its physical store, with returning customers driving most orders, but it also has a complementary e-commerce website and uses an app to communicate with customers. In a constantly changing business environment, the founder stresses the importance of continuous self-education and adaptability in her industry. Challenges include expensive shipping, limited access to finance, and the disparity between online and physical sales. Annada is actively promoting the use of artificial intelligence to enhance efficiency.

Indonesia-based Iota Kreatif Media is a creative digital company specialising in games and entertainment. Although the company does not rely on e-commerce platforms, it focuses on business-to-business (B2B) transactions and has a solid online presence through its website. Co-founder and creative director Ratna Yoes highlights the government's supportive policies for the gaming industry as a positive development in Indonesia. Artificial intelligence plays a pivotal role in streamlining creative workflows, showcasing the potential for artificial intelligence to contribute significantly to the creative process.

Source: UNCTAD.

In the **film industry**, artificial intelligence can help create and analyse screenplays, streamline pre-production processes, analyse data and audience preferences, and create more realistic special effects (Anantrasirichai and Bull, 2022). Artificial intelligence improves workflow efficiency and accuracy. Machine learning tools can arrange video clips, making it more straightforward for editors to find specific camera angles and dialogue scenes. Additionally, artificial intelligence algorithms assist in restoring old prints by eliminating dirt and scratches and correcting warp and flicker issues (*Wired*, 2023).

The role of artificial intelligence in the pre-production stage has been especially notable. Hollywood companies are gradually adopting artificial intelligence tools to analyse financial, script, audience data and ultimately influence studios' commissioning decisions. These tools combine machine learning techniques, natural language processing, data mining and big data, and principles from risk analysis within the context of

the filmed entertainment business. For example, an artificial intelligence platform processes film screenplays as inputs and generates analytics about features of the screenplay, commercial viability and a final recommendation to greenlight or reject. These analytics can include character's likeability, emotions by scene, measurements of gender equality, potential audience, predictions of gender and age breakdown of target audience, predictions of audience satisfaction ratings, financial forecasts, return on investment and information on which territories the screenplay is likely to find a receptive audience (NECSUS, 2020).

While artificial intelligence represents opportunities for film studios to gain productivity and cut costs, it can threaten movie industry workers who see their jobs at risk of disappearing. Hollywood writers initiated a strike in May 2023, expressing concerns about artificial intelligence-generated scripts that potentially displaced many writers. These professionals were concerned that studios might begin creating



scripts using artificial intelligence, reducing the need for most writers. Furthermore, writers wanted to guarantee that their previous works, such as screenplays and scripts, would not be used to train artificial intelligence systems. Actors represented by the Screen Actors Guild (SAG) joined the strike, citing pay and artificial intelligence issues. Both groups advocated for contracts protecting their roles from being taken over by artificial intelligence, whether in scriptwriting or as background actors (*Reuters*, 2023b). The actors' union negotiated a tentative agreement after a 118-day strike. According to that contract, actors would be getting higher wages. However, analysts worry that this may add 10 per cent to the cost of making movies and that shows, and studios will have to cut back on production to finance the higher costs. For example, an animation studio has recently cut jobs for 4 per cent of its employees. A premium cable network and streaming service, is undergoing a 10 per cent reduction in its workforce (*The New York Times*, 2023).

Artificial intelligence has been used in creation, production, and distribution in the **music industry**. It is used to generate music using vast databases of already existing tracks, blend them, develop new original compositions (*Arts Computing Office Newsletter*, 2021), and provide platform users with personalised recommendations. In many ways, this emerging technology opens up new opportunities for artists to produce music that goes beyond known genres, more novel methods of collaboration, and more options for consumers to personalise their content.

In 2016, a computer science laboratory music team released the first full song generated by artificial intelligence.⁹ The composition was purposefully made to sound like a Beatles song by having access to a database of thousands of songs (*Arts Computing Office Newsletter*, 2021). More

recently, the effects of artificial intelligence on the music industry have deepened and become more apparent. For example, the technology allows the disassembling of songs into malleable components, also known as stems. This function sometimes mixes and matches voice and music elements to form new compositions. This feature allowed Paul McCartney to recover an old recording from the Beatles and make the final Beatles song without synthetically creating new material.

While using artificial intelligence brings opportunities, on the other hand, it brings more challenges, especially concerning the legal implications of copyright laws. There are a growing number of cases where artificial intelligence is actively used to synthesise the voices of existing singers. In some cases, this is leveraged by songwriters who want to demonstrate to potential partners what a specific artist would sound like on a track before it is recorded. While this may benefit the songwriter or publisher, this may be poorly interpreted by the singers whose voices are manipulated and by demo singers who may lose work opportunities (*Billboard*, 2023a). In other cases, the public creates artificial intelligence-generated music, raising concerns about the ownership and credits over sourced musical elements. A track generated by artificial intelligence to mimic the voices of two singers, Drake and The Weeknd, was subsequently taken down by online platforms due to copyright claims (*Variety*, 2023).¹⁰ Similarly, in the Republic of Korea, an artificial intelligence-generated rendition of an original song of a girl group, included mimicking a rock singer's voice.¹¹ However, amidst the trend of using artificial intelligence music generation services, clear policies regarding the unauthorised use of original artists' aural work have yet to be established (*The Korea Herald*, 2023).

Several factors in the **news and media industry** contribute to more use of artificial intelligence. Process efficiency is one of these factors. This efficiency builds on

⁹ See "Daddy's Car".

¹⁰ The track is called "Heart on My Sleeve".

¹¹ The song is "Hype Boy", the girl group is NewJeans, and the rock singer is Yim Jae-Beom.



contributions from artificial intelligence to automated summaries, conversion between text and speech, image recognition, automated tagging, subtitles, and transcriptions (Newman, 2023). The immediate potential gains from this efficiency must be balanced with the important investments required to adopt artificial intelligence tools (*Columbia Journalism Review*, 2024). Major media organisations¹² have already incorporated artificial algorithms into their operations to increase their newsrooms' productivity (FADEL, 2023).

Artificial intelligence contributes to efficiency and engagement by providing content recommendations, automating web pages, optimising news headlines and finding the best time to post (Newman, 2023). For example, some media organisations¹³ use artificial intelligence-driven software to generate quarterly financial reports for many publicly traded firms (FADEL, 2023). Other firms use similar tools to efficiently create stories on traffic or property sales that attract and retain readers (Media Voices, 2023).

Some functionalities help to free journalists' time while facilitating news research and customisation. Some media organisations¹⁴ employ artificial intelligence tools to offer suggestions for article topics and potential sources to its writers. Similarly, another media organisation¹⁵ uses an artificial intelligence system that conducts real-time data analysis to assist journalists with identifying newsworthy stories much quicker (Saikaly, 2023). Artificial intelligence performs data analysis to pick up stories. For example, a system detected news potential by analysing data and identifying that a football team had won for the first time in 40 matches. As another example, a story relying on data can be customised by generating several stories, each using specific data for an area of a country (Media Voices, 2023).

Artificial intelligence also assists in other functions, including creating illustrative art

for articles and blog posts (Newman, 2023). This appears to be the most frequent use of artificial intelligence by 41 per cent of news teams. This is followed by generating social media content – 39 per cent of news teams, writing copy or generating content – 38 per cent, personalising and recommending – 35 per cent, and translating and locating – 31 per cent (WordPress, 2023) (Figure 40). The journalist remains responsible for checking, clarifying, and adding value to the automated media story, for example, by adding empathy, insight, judgement, or customisation. Curation is by people, which remains with more time to produce in the cases where these artificial intelligence tools generate content (Newman, 2023).

An issue in this industry is that image media is highly vulnerable to manipulations, making it hard to distinguish between fact and fiction. Deepfake technology has exploited this vulnerability, distorting or fabricating videos. Deepfakes are computer-generated audio or video that create the illusion of individuals saying or doing things they never actually did (Massachusetts Institute of Technology Open Documentary Lab, 2021). The deepfake video project “In Event of Moon Disaster” highlighted this issue by presenting an alternate history of the Apollo 11 mission. The project won an Emmy for Outstanding Interactive Media in the documentary category (Massachusetts Institute of Technology, 2021). As another example, there is a firm producing digital twins of news anchors. This has the risk of undermining trust (Newman, 2023). Thus, it is becoming increasingly important for people to have media literacy, skills that empower them to find, understand, and assess various forms of media (Massachusetts Institute of Technology, 2021). Other efforts should include transparency, digital watermarking and moral guidelines (Newman, 2023).

¹² Major media organisations including the Associated Press, Reuters and The New York Times.

¹³ For example, Associated Press.

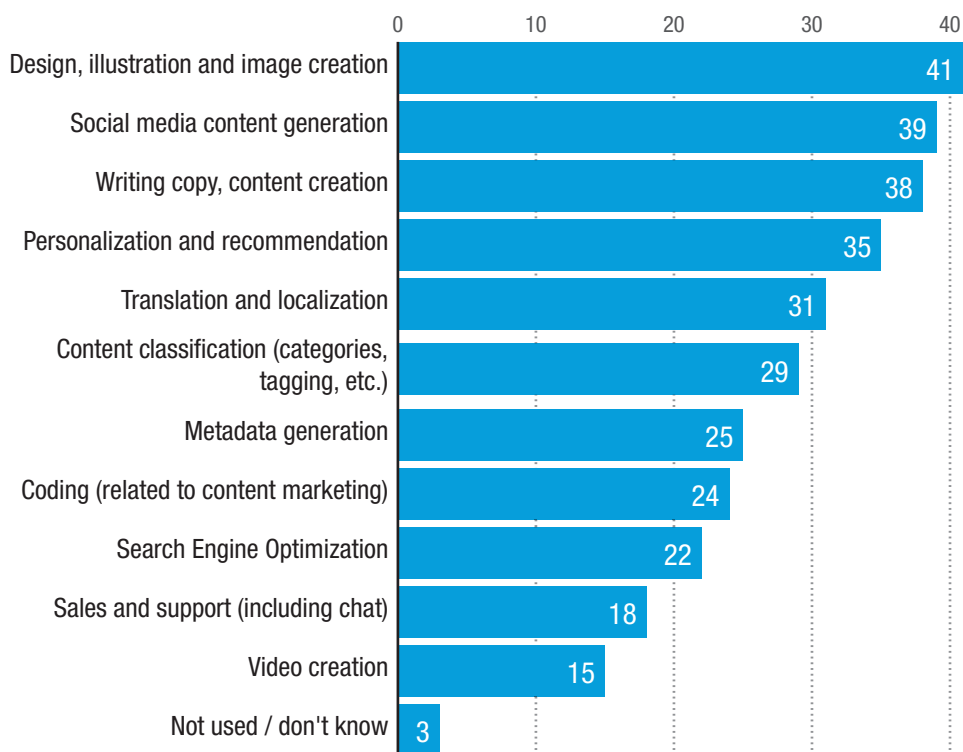
¹⁴ For example, the New York Times.

¹⁵ Namely, the Reuters.





Figure 40
Use cases of artificial intelligence by news teams, 2023
(Percentage)



Source: WordPress.

Another important issue with using artificial intelligence in the news and media industry is the asymmetry of benefits and costs. Some workers may gain efficiency to focus on higher value-added tasks, while others may lose their jobs. Some firms are better prepared and develop best-fit tools, while others rely on artificial intelligence solutions provided by big platforms. This increases the dependence of some news and media firms on technology firms (*Columbia Journalism Review*, 2024).

In **performing arts**, artificial intelligence can intervene throughout the whole process. Algorithms can support text research by analysing vast amounts of literature, translating texts, and suggesting scripts, narratives, choreographies and characters. Artificial intelligence can support the production process by drafting grant applications and project proposals and

increasing cost efficiency in the production process. It can also contribute to set design by creating interactive environments that respond to actors' movements or changes in the storyline, creating a more immersive experience for performers and audiences. Performers can interact with automatically generated visuals, augmented reality or sound that respond in real-time, customising the performance. Some artists use artificial intelligence to analyse reactions from the audience to improve engagement.

Artificial intelligence has improved design, interactivity, and decision-making in the **video game industry**. As video games increasingly strive to offer more realistic and immersive experiences, often integrating three-dimensional visualisation, augmented reality and virtual reality methods, artificial intelligence algorithms have been utilised to influence multiple layers of dynamic



player experiences. For example, artificial intelligence algorithms have been trained to design and develop interactive storylines that respond to player choices. Artificial intelligence techniques have also been used to procedurally generate content in-game, which refers to the automatic and random generation of content such as levels, environments, and rules. This builds personalised and fresh experiences, giving individual players a sense of autonomy and uniqueness in their gameplay experiences (Anantrasirichai and Bull, 2022).

C. Challenges and risks

The digital transformation of creative industries **also poses challenges**, especially regarding using artificial intelligence. These challenges relate to quality, consumer welfare, copyright, market concentration and competition, jobs, and development asymmetries.

The **quality** of artificial intelligence-produced content needs further assessment. The quality of artificial intelligence products relies on the performance of its algorithm, and on the database the algorithm uses. An artificial intelligence system can be fed with some data rather than others. It can prioritise some patterns to the detriment of others to optimise the commercial objectives of its promoters. This has triggered concerns about how algorithms can reduce cultural diversity because some cultures and languages may be left out from the databases training the algorithms, with the risk of monoculture or bias.

Furthermore, many people consume images, music, videos and news through centralised platforms. The criteria of these platforms' proprietary algorithms to select or recommend content are not transparent or auditable. They may be conditioned to the commercial interests of the platforms (European Parliament, 2020). The preference of most people to consume content related to known references may privilege recommendations of established rather than

new artists, favouring consolidation to the detriment of innovation (Maekan, 2022).

Quality concerns can disproportionately affect people in developing countries. Most artificial intelligence systems were trained with data gathered from people from developed countries or otherwise specific to the reality of developed countries. This can generate outputs that do not serve the interests of people in developing countries. For example, digital medical services building on artificial intelligence tools may be better equipped to address concerns of high-blood pressure in a developed region than malaria in a developing country because the algorithm was less exposed to data on the latter. Another dimension of this bias on source data is that many artificial intelligence systems are trained to satisfy the preferences identified by people in developed countries. This may imply that less visible artists from developing countries are less likely to be recommended by artificial intelligence tools which, as previously mentioned, will privilege more known references. Furthermore, artificial intelligence systems are most often trained in English putting at a disadvantage people from developing countries who are not English native speakers (*Foreign Affairs*, 2023) and may have limited access to learn foreign languages.

Appropriation is an issue with both moral and economic dimensions regarding artificial intelligence applied to the creative economy. The moral dimension discusses whether building on work from others is acceptable. The economic dimension discusses whether appropriate compensation is provided for the authors of the work that is used as a basis for appropriation.

The moral analysis between code-based art and people-based art should be similar. Appropriation is the force behind artificial intelligence, as people use databases directly and indirectly to train it. But appropriation is inevitable in art creation as all creators have influences, experiences and aesthetic references. The art world has formally acknowledged appropriation as



an artistic form, which had an established role during art movements such as pop art (Karakaidou, 2019). This implies that artists who use tools from the platforms to facilitate creative activities and other users of those platforms may be doing a morally acceptable appropriation. The acceptance does not hold when the code-based art involves other moral issues related to cultural appropriation.

In addition, many creators argue that artificial intelligence tools undermine the time and talent put into people-based art and affect their livelihood. The latter relates to the need to discuss economic compensation. The economic dimension of appropriation is also key when discussing the centralised governance of artificial intelligence by some tech giants. Artificial intelligence experts who work on these platforms and many of the artists who feed the databases underlying the algorithms have insufficient negotiation power (WIPO, 2018) to claim appropriate compensation from the giant gatekeepers, as discussed in Chapter IV. This challenge also has a development dimension, as many people in developing countries will have less chances to claim appropriate compensation and possibly lower negotiation power to advocate for systemic changes in this current artificial intelligence paradigm.

This brings **intellectual property rights** (IPRs), especially copyrights, to the forefront of discussing artificial intelligence in the creative economy. Copyrights protecting creators are designed for an analogue environment, and new business models, such as streaming, present a challenge for copyright experts. Policymakers and regulators need to discuss issues such as royalties for artists on streaming platforms, reselling of e-books, and platform liability for unauthorised uploaded content (UNCTAD, 2022a).

The “Next Rembrandt” project illustrates the challenges in determining authorship. The project built on Rembrandt’s work to generate an image that could be the next piece of the painter. In the United Kingdom of Great Britain and Northern

Ireland, regulations define the author of a computer-generated artwork as the person undertaking the arrangements to create the work. In Germany, regulations do not protect artificial intelligence artwork. In the regulatory frameworks of Germany and of the United Kingdom, artificial intelligence system cannot be an author, although this barrier is continuously challenged (European Parliament, 2020). Due to copyright concerns, stock image services have prohibited posting and selling artificial intelligence images (Dataconomy, 2022).

Development challenges also exist on IPRs related to artificial intelligence as some developing countries face regulatory gaps in this area. While this is an issue that exists in several areas, the gaps may be particularly acute regarding the regulation of new technology.

Consumer protection remains a key issue of digitalization in the creative economy. For example, when buying creative products, consumers expose themselves by providing personal and payment data to platform companies. However, many countries do not have national laws regulating domestic e-transactions and online consumer protection (UNCTAD, 2021a).

In the case of artificial intelligence in the creative economy, consumers may be exposed to the above-mentioned quality issues. This includes consuming cultural products with possible reduced cultural diversity and bias due to the algorithm’s performance or training data. Excessive reliance on artificial intelligence for decision-making could promote narrow-mindedness (European Commission, 2022).

Furthermore, manipulation of visual or audio media has been enhanced with artificial intelligence for entertainment or malicious purposes. This has created deepfakes with improved realism, sometimes by replacing faces or synthesising mouth movements to fake a speech and with body movements generated by learning with source videos. Text manipulation can also occur with text generator tools that



produce coherent paragraphs and have been used to create fake news or spam (Anantrasirichai and Bull, 2022). Deepfakes call for more debate on whether the manipulators use artificial intelligence to infringe copyright or misappropriate data.

Using personal data, such as images or videos, for deepfakes challenges consumer protection, privacy and moral issues. Developing a regulatory framework that addresses these concerns also requires considering that data has become an inescapable resource for several companies to improve their performance. The use of data in an appropriate, authorised, acknowledged, and economically compensated manner should ensure privacy and consumer protection while allowing firms to build on data for their competitiveness.

Regulatory challenges related to consumer protection in some developing countries also create development challenges. Many people in developing countries will have less recourse to challenge artificial intelligence issues such as use of personal data or manipulation of content. In addition, some artificial intelligence systems can perform worse than advertised and consumers in some developing countries need better ways to report issues and appeal decisions (*Foreign Affairs*, 2023).

Jobs in the creative economy are changing with the increased use of artificial intelligence. Some discussions point to a job decrease in automated activities and a job increase in activities related to automation development. Recent research by the International Labour Organization argued that the emergence of generative artificial intelligence applications shifts the competition to higher-skilled jobs (International Labour Organization, 2023b). Some applications excel in cognitive tasks like analysing texts, drafting documents, and retrieving information from various sources. This study suggests that the new wave of automation will

predominantly affect knowledge workers in the short term. Technicians, journalists and market research analysts could face competition from artificial intelligence.

For example, this risk may impact some developing countries which have significant exports related to information technology. For instance, India and Singapore ranked among the three developing countries that exported more telecommunications, computer and information services in 2022. These countries accounted, respectively, for 10 and 2 per cent of global exports in this category. At the same time, information and communication sectors in these countries relied heavily on jobs with advanced education. In 2022, India and Singapore had 87 and 86 per cent of people with advanced education in jobs in this sector, respectively. This is above the global average of 71 per cent in the same year.¹⁶

In February 2024, concerns about the potential of artificial intelligence halted an investment of US\$ 800 million in soundstage expansion to a studio. The investor worried that the ability of intelligent systems to generate scripts and finish videos from simple text prompts might eliminate the need for location travel or set construction and put writers, composers and other creative professionals out of work (Forbes, 2024).

Research on the Mexican economy pinpointed the average likelihood of automation for domestic jobs in the second quarter of 2022. This likelihood was 63.7 per cent in non-creative and non-cultural industries and only 0.15 per cent in cultural and creative industries (CAIINNO, 2023). An analysis of the Survey of Adult Skills (PIAAC) data indicates that the high risk of automation of activities within the OECD stands at 14 per cent for the overall job market and a lower 10 per cent for creative and culture-related jobs (OECD, 2022b). This study aligns with other analyses suggesting that creative roles are more resilient to automation. The ongoing digitalization

¹⁶ Export data from UNCTADstat (<https://unctadstat.unctad.org/EN/>) and job data from ILOSTAT (<https://ilostat.ilo.org/>), accessed 22 May 2024.



of the economy may even generate increased demand for creative skills.

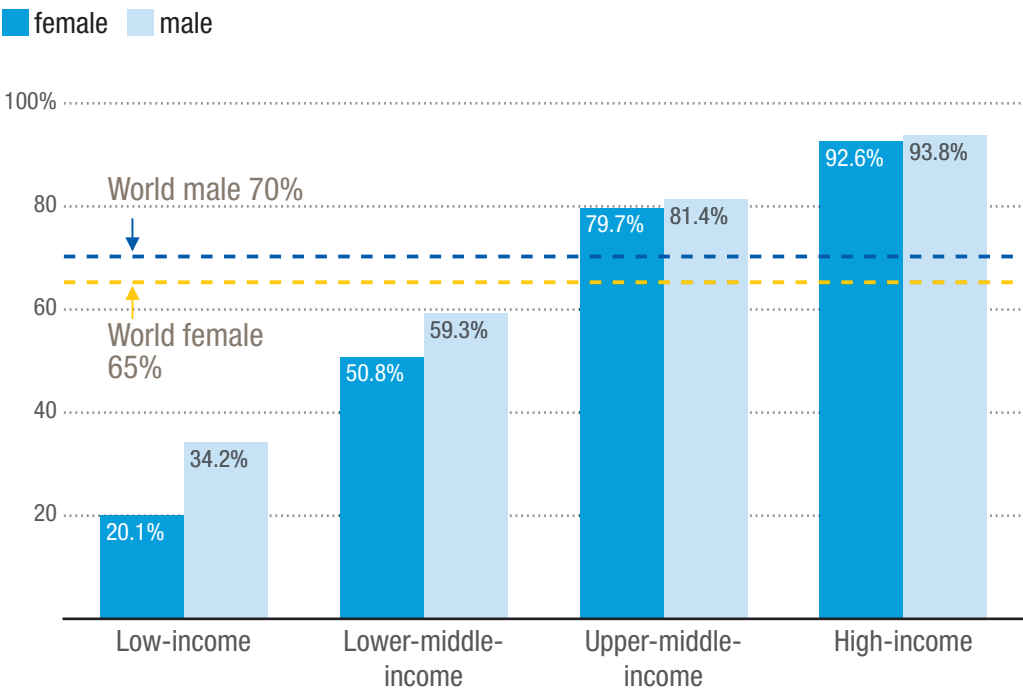
A challenge in the future of work in the creative economy is identifying professionals who can use artificial intelligence technologies and manage change. Artificial intelligence developers may not understand the work done in creative industries, and creative industry professionals may not be experts in artificial intelligence. This may also imply a change in how sectors are organised. Creative industry firms' lack of in-house capabilities makes them dependent on artificial intelligence technological companies (European Commission, 2022).

Development asymmetries also create development challenges in using artificial intelligence in creative industries. Currently, many artificial intelligence-related technologies come from developed countries. Developing countries must often allocate resources to other urgent needs such as education, healthcare, or public debt repayment (*The Conversation*,

2022). Developed countries, along with China and India, dominate the “Global AI Index”, measuring talent, infrastructure and research and development capabilities (Tortoise, 2022). The first Latin American country is Brazil, in 39th place, and the first African country to appear is South Africa at 55th. This trend could widen the digital divide between developed and developing countries (International Finance Corporation, 2019).

In 2023, economies of different development levels showed a wide Internet usage gap. Countries with higher incomes have higher Internet usage. Countries with a high income had 93 per cent of individuals using the Internet, while countries with low income had 27 per cent (International Telecommunication Union, 2023). Women used the Internet less than men at all development levels. This gender gap was 1 percentage point in high-income countries and 14 percentage points in low-income countries (Figure 41). A wider

Figure 41
Percentage of individuals using the Internet by gender, 2023
(Percentage)



Source: UNCTAD, based on International Telecommunication Union (2023)

gap exists between Internet usage in urban and rural areas, with rural areas showing a lower usage. This gap was 7 percentage points in high-income countries and 30 percentage points in low-income countries (International Telecommunication Union, 2023). Infrastructure, accessibility, and overall cost remain likely issues that inhibit faster growth in this area.

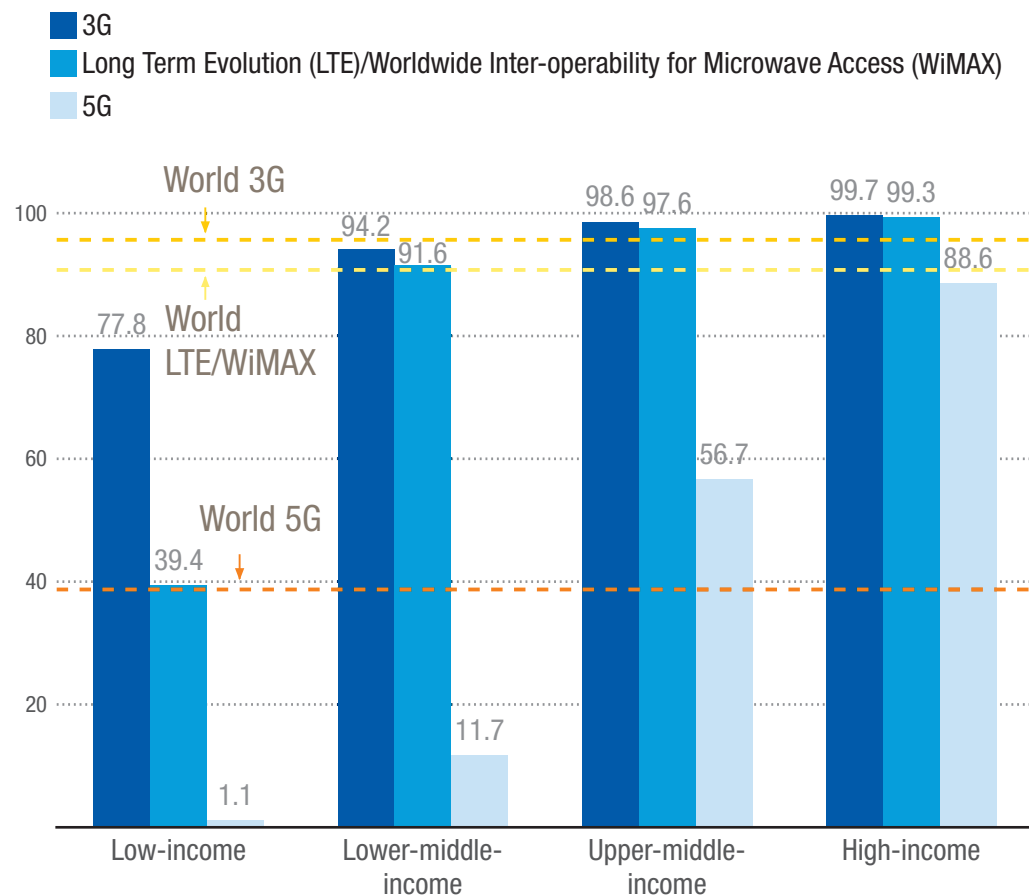
In the same year, many regions reached over 80 per cent of 3G mobile network coverage. LTE or WiMAX mobile networks were implemented later but increased faster and have reached similarly extensive coverages. The more recent 5G mobile network is still facing a more imbalanced global climb,

confirming the infrastructure dimension of the digital divide. Countries with higher income have higher coverage of mobile networks. This is valid for all technologies, but the asymmetry is higher in the more recent and advanced 5G mobile network. Countries with high income had 89 per cent of their population covered by 5G mobile networks in 2023, while countries with low income had only 1 per cent (Figure 42).

Another technological benchmark where some developing countries face challenges is on digital recordkeeping systems that are necessary to use the potential of artificial intelligence (*Foreign Affairs*, 2023).



Figure 42
Population covered by mobile network by technology and level of income, 2023
(Percentage)



Source: UNCTAD, based on International Telecommunication Union (2023)



D. Policy considerations

Digitalization and artificial intelligence may be a game changer for several creative industries. Policymakers need to monitor technological developments and update the relevant policy and regulatory frameworks that harness the opportunities and mitigate the risks for the creative industries.

Several countries around the globe recognise the transformative potential of

digital technologies and artificial intelligence in the creative economy. 14 of the 36 countries participating in the UNCTAD survey reported specific initiatives on digitalization and artificial intelligence for creative industries (Box 4). Nine countries (i.e., Argentina, Cambodia, Cuba, Egypt, Nigeria, Pakistan, Seychelles, Sri Lanka, and Trinidad and Tobago) provide incentives for enterprises through more generalised policies, including enabling e-commerce and building digital skills.



Box 4

Examples of government-led initiatives to leverage digital tools and the use of artificial intelligence in the creative economy

China made significant investments in integrating science and technology with traditional industries. Efforts are underway to develop digital cultural trade, strengthen digital content creation, and promote digital models of cultural consumption. Notably, the Zigong lantern arts industry used scientific and technological innovations to help transform and upgrade this traditional cultural industry. These used three-dimensional printing, augmented reality and virtual reality, and 5G technologies to revitalise traditional crafts and enhance their market presence.

The **Dominican Republic** outlined a comprehensive digital agenda to harness artificial intelligence across various sectors, including creative industries. The National Artificial Intelligence Strategy seeks to transform and elevate the economy through sophisticated automation and innovation. This strategy is part of a broader effort to position the Dominican Republic as a regional leader in artificial intelligence. It also enhances creativity, innovation, and market access within its creative sectors.

The Gambia responded to digital challenges and opportunities by launching The Gambia Digital Economy Master Plan 2023. This plan aims to build on emerging technologies to benefit creative industries, addressing issues such as copyright and income generation in the digital space.

Indonesia is leveraging digital tools and artificial intelligence to promote its creative economy, focusing on village tourism, developing digital talent, and facilitating the necessary ecosystem. The National Strategy for Artificial Intelligence reflects a comprehensive approach to integrating artificial intelligence technologies across sectors, including creative industries, to foster innovation and competitiveness.

Jamaica, through a project called 'Caribbean Animation Business Model, facilitated collaboration across Caribbean studios over a virtual platform and represents a step towards regional cooperation and global competitiveness of animation studios.

By establishing a study group, **Japan** is addressing the complex interplay between artificial intelligence technologies and intellectual property rights. This initiative aims to deepen understanding and provide guidance on legal issues related to artificial intelligence in the creative process.

Malaysia introduced a programme called DIVRSE'22 – Makyung in Metaverse, an innovative project with a series of online events. It combines traditional performing arts with modern digital technologies like augmented and virtual reality. This initiative highlights the potential for cultural heritage and digital innovation, creating new forms of creative expression.



Mauritius embraced augmented reality through the Dodo Expedition AR app, offering a novel way to engage with the extinct Dodo bird at the Natural History Museum. The Mauritius Expo Virtual Platform also represents a digital space for local artists to showcase their work, exemplifying the country's commitment to integrating digital technologies within its creative sector.

Oman launched the Makeen initiative to equip Omani youth with digital skills, reflecting the country's ambition to transform its economy and workforce through digital technology and artificial intelligence. This initiative emphasises the importance of developing national competencies to meet the evolving demands of the digital creative economy.

In the **Philippines**, the Implementing Rules and Regulations of Republic Act 11904 aims to develop and promote the Philippine creative industries. The law provides for digitalizing creative industries by granting access to digital services and digital training platforms for creative businesses.

The **Republic of Korea** is addressing copyright concerns related to artificial intelligence by preparing an AI-Copyright Guide. This guide aims to clarify and reduce legal risks for developers, copyright holders, and users of artificial intelligence-generated materials, and underscores the importance of legal frameworks in the age of digital creativity.

In **Slovenia**, upcoming initiatives of the Ministry for Culture will support cultural and creative industries in their fair digital transformation. The initiatives aim to open opportunities for creative SMEs, create new forms of media and storytelling, promote fair e-payments for creators, improve distribution and equal access to information and content, and promote creative businesses' professionalisation and exports.

Sri Lanka is pushing the country's creative economy by integrating emerging technologies to stimulate innovation and international reach. The Academy of Design leverages Sri Lanka's design potential in the global landscape. This academy guides creative industries' young talent with knowledge dissemination and increased engagement with emerging technology institutions from big tech to artificial intelligence startups.

The **United Kingdom of Great Britain and Northern Ireland** has been an early supporter of integrating artificial intelligence within its creative industries. The government's £ 100m BridgeAI programme^a helps creative industries and other priority sectors to harness the power of artificial intelligence and unlock their full potential. The government is also investing £50 million into the next wave of the Creative Industries Clusters Programme (Department for Science, Innovation and Technology of the United Kingdom of Great Britain and Northern Ireland, 2023) supporting the sector to maximise benefits of artificial intelligence.

^a See <https://iuk.ktn-uk.org/programme/bridgeai/>.

Source: 2024 UNCTAD survey on the creative economy.

Quality and consumer welfare

Quality and consumer welfare are promoted with people supervising the results of artificial intelligence in creative industries, acting as human curators. The collaboration of technology and people is the best scenario for developing content, as determined in the analysis of content generation in the film industry. Transparency on algorithms is needed to ascertain which patterns are prioritised and that commercial interests do not unduly condition the algorithm. This includes

preserving cultural diversity and ensuring that there is no cultural appropriation.

Regulations should cover these aspects and, in general, online consumer protection. Regulation for deepfakes could envisage the use of data in an appropriate, authorised, acknowledged, and economically compensated way. This would ensure privacy and consumer protection while allowing firms to build on data for competitiveness. International cooperation is a key dimension of devising these regulatory frameworks, as detailed below under "Artificial intelligence governance and

policy frameworks". Managing deepfakes also calls for media literacy to assess and understand media and could include requirements on transparency, digital watermarking, and moral guidelines.

Intellectual property rights

Most existing intellectual property rights regulations and policies were formulated before the widespread adoption of digital technologies. These regulations may not adequately address new issues like intellectual property in the digital realm, online distribution, and user-generated content. Technologies like artificial intelligence are increasingly used in creative processes, raising questions about ownership, accountability, and transparency. Policies need to address these new challenges. Policymakers must collaborate with industry stakeholders, legal experts, technology specialists and others to adapt regulations to the evolving digital landscape.

The main gaps and challenges in public policies related to the increasing digitalization of creative industries include protecting IPRs, especially copyrights. These become more difficult to enforce due to the ease of access to content, copying, and redistributing content. Policymakers need to adapt copyright laws to the digital age and establish an appropriate balance between the rights of creators, consumers, and platforms in the digital space. Similarly, a balance is called between protecting the creators' and authors' copyrights and fostering an environment that encourages innovation and creativity.

In Angola, public policies face the additional challenges of informality and creators' reduced negotiation capacity. Policymakers in the country could consider actions to improve IPR literacy and apply a whole-of-society approach to consultations on IPR regulations. A national IPR strategy can consolidate IPR rules and improve clarity. Adhering to international treaties of IPR can promote minimum levels of rights and obligations.

A recent study conducted on digital video piracy found that this piracy leads to between US\$40 to US\$97 billion in revenue losses for the global film industry. The losses range from US\$40 billion to US\$95 billion for the global television industry (Global Innovation Policy Center, 2019). Similar studies show that the Indian entertainment sector experiences an annual revenue loss of approximately US\$2.8 billion due to digital piracy (The Times of India, 2022). Piracy of movies and TV shows is an even bigger issue in Africa (*Reuters*, 2009). It is so rampant that some companies choose not to release their content in their countries. Instead, they decided to sell their shows only to audiences living in countries with better rules to control piracy.

The US Digital Millennium Copyright Act (DMCA) of 1998 heightens the penalties for copyright infringement on the Internet. Furthermore, the law criminalises the production and dissemination of technology, devices or services intended to circumvent measures that control access to copyrighted works. The law also criminalises circumventing access control, whether or not there is actual infringement of copyright itself.

The challenges related to copyright issues are even more prominent with the rise of artificial intelligence. The European Union and the United States of America assert that authorship should be attributed exclusively to natural persons. Consequently, the role of artificial intelligence is confined, acknowledged at most, as a tool within the legal framework. This role is not recognised as a co-author. Analysing some regulations in Latin American countries points to similar approaches, recognising only natural persons as authors. This is evident in collaborative and joint authorship regulations in Argentina (Article 16), Chile (Article 5), Colombia (Article 8), Honduras (Article 9), and Mexico (Article 4). None of these legal provisions explicitly address economic compensation for a work resulting from co-creation, treating artificial intelligence solely as a



tool, not a co-author. The challenge with exclusively protecting and compensating works created by natural persons lies in determining their level of participation. This can be particularly difficult with certain creations. Additionally, investors could face uncertainties if artificial intelligence inputs are freely accessible, as property rights would be ineffective and revenue would decrease (Santamaría Hernández, 2021).

Artificial intelligence governance and policy frameworks

Clear and transparent regulation for artificial intelligence is important for creative industries. This clarity and transparency protect artists' rights, uphold moral and commercial responsibilities, provide effective guidelines, balance innovation with responsibility, and prevent the uncontrolled proliferation of artificial intelligence-generated content. Without such regulations, the creative landscape may face moral, legal, and commercial challenges that hinder its growth and sustainability.

Several countries took steps to develop a regulatory framework around artificial intelligence. These frameworks are not specific to creative industries but have important implications for creative industries and workers. Some examples include:

- In Canada, the Pan-Canadian Artificial Intelligence Strategy was launched in 2017 and is the first of its kind. This strategy is a five-year plan that designates US\$125 million in investment to advance artificial intelligence technologies to bring positive social, economic and environmental benefits to people and the planet.
- China's New Generation Artificial Intelligence Development Plan in 2017 outlines ambitious goals for artificial intelligence development.
- The European Union's "AI Act" is part of its broader digital strategy and outlines rules for artificial intelligence's moral and trustworthy use.
- France has released a National Artificial Intelligence Strategy, which includes

funding for research, development, and the establishment of artificial intelligence moral guidelines.

- Germany has established a Data Ethics Commission to guide data and artificial intelligence morals.
- Singapore has developed a National Artificial Intelligence Strategy, focusing on four key pillars: (1) driving artificial intelligence adoption, (2) growing artificial intelligence capabilities, (3) ensuring artificial intelligence is explainable and human-centric, and (4) ensuring artificial intelligence is applied in a moral and responsible manner.
- The United States of America National Artificial Intelligence Initiative Act of 2020, signed into law in early 2021, aims to accelerate artificial intelligence research and development across various sectors.

Further to these national initiatives, there are arguments about the benefits of international cooperation in designing regulatory frameworks for artificial intelligence. The technical argument recognises that research and development and technological applications of artificial intelligence to creative industries and other sectors are resource-intensive and benefit from scale in knowledge, talent, computing capacity and data. International cooperation on the technical aspects of artificial intelligence can lead to standards through organizations such as the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), the Institute of Electrical and Electronics Engineers (IEEE) and other standard development bodies (Brookings, 2021). Such technical discussions are relevant for development aspirations of countries. Developing countries should be involved in shaping possible artificial intelligence standards, including on how it applies to social, political and economic life, comprising creative industries. These standards should have built-in development concerns, which can include considerations on skill, digital and infrastructure gaps, protection of data, and others.



International cooperation should aim to build trust by producing commonly agreed principles to develop and use artificial intelligence and the related policy and regulatory frameworks (Brookings, 2021). These principles should ensure the right of countries to use artificial intelligence for social and economic development, including industrial policy initiatives. At the same time, the principles should pursue the benefits of regulatory convergence, reducing unjustified trade restrictions for artificial intelligence related innovation, diffusion and trade. Different regulatory requirements can affect how data are collected, stored and transmitted. These differences can change how artificial intelligence models use data and how they are built. Striking a balance between policy space and convergence would allow developing countries, for example, to support their creative industries by protecting their data, while promoting the use of artificial intelligence for efficiency gains in those same creative industries.

The G7, the European Union and 28 European governments emphasized the need for international cooperation in regulating artificial intelligence, recognising that several of the associated risks are of an international nature and require joint efforts. All have further stressed the importance of a multistakeholder governance, security, responsibility and human rights protection in implementing and advancing artificial intelligence (*Italian Institute for International Political Studies (ISPI)*, 2023). In December 2023, the High-level Advisory Body on Artificial Intelligence, created by the United Nations Secretary-General, published an interim report on governing artificial intelligence for humanity. The document suggests several guiding principles for the international governance of artificial intelligence. This report recognises that artificial intelligence can assist people not only in everyday tasks but also on their most ambitious, creative and productive endeavours (United Nations, 2023).

Jobs and skills

The roles and tasks of creative industry actors are changing as emerging technologies such as artificial intelligence become increasingly embedded in creative value chains. An important effect is the increasing demand for new digital skills, which calls for education and training policies to meet that demand.

This shift causes job gains and losses. Support is needed for those in vulnerable situations. This includes education and training, contract protection, and social support. The debate on socialising the benefits of artificial intelligence deserves merit, including more discussion on universalising income decoupled from work.

Strategies to develop skills are particularly relevant for development aspirations. Skill building should attend to some of the aforementioned challenges and include an interdisciplinary approach and a continuous learning dimension. For example, creative economy professionals should learn to use artificial intelligence technologies and also to manage change. This has the objective to prepare these people to seize the benefits of artificial intelligence in their work, while preparing them to the extent possible for the changes that artificial intelligence can cause in job gains and losses.

Development asymmetries

Policies should consider the digital divides and aim to close the digital, knowledge, physical and digital infrastructure gap between genders, urban versus rural areas, and regions with differing developmental levels. This should consider asymmetries in access to the Internet, mobile networks, and other forms of telecommunications.

Policymakers also need to promote affordable digital tools and access to new payment technologies for creative industries in all countries, particularly developing countries.

