



## LEVERAGING ON TECHNOLOGY: KEY CONSIDERATIONS TO GROW THE KZN AUDIO-VISUAL SECTOR



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## List of Acronyms

5G	Fifth Generation cellular network
3D	Three Dimensional
AI	Artificial Intelligence
AR	Augmented Reality
AV	Audio Visual
CGI	Computer Generated Imagery
DFO	Durban Film Office
DTT	Digital Terrestrial Television
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
FDI	Foreign Direct Investment
FITI	Film Industry Transformation Initiative
FTA	Free to Air
GDP	Gross Domestic Product
IT	Information Technology
KZN	KwaZulu Natal
KZNFC	KwaZulu Natal Film Commission
NDP	National Development Plan
NFVF	National Film and Video Foundation
OTT	Over the Top
TV	Television
VOD	Video on Demand
VoIP	Voice over Internet Protocol
VR	Virtual Reality

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## 1. INTRODUCTION

The audio visual (AV) sector is a dynamic sector that has evolved significantly in recent years due, in part, to technological developments. The structure of the AV sector is multi-dimensional, complex, and highly integrated. The audio-visual market encompasses television production, video and film production, and the internet hosting of popular sites such as YouTube, Instagram, Tik Tok and many others. The audio-visual market has also in recent times expanded to include office and home markets that consist of meetings, conferences and even music and entertainment festivals.

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***A simple framing of the audio-visual sector is all electronic media markets possessing both a sound and visual component. The audio-visual sector thus encompasses a range of creative production activities including film, TV and internet-based content creation, and multimedia.***

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The AV sector is thus a vast sector with extensive networks throughout all aspects and dimensions of the modern technological-driven economy. The AV sector has strong links with and is heavily influenced by changes in technology. Nearly every single aspect of the AV industry and value chain, is influenced by the usage and advancement of technology to meet demand and deliver quality end products. Globally, technology, digitisation and innovation are rapidly expanding, accelerated by the restrictions brought on by the Covid19 pandemic as people adjust to the 'new normal'. However, the impact of Covid-19 has not all been positive especially within the AV sector. There are components of the sector such as the traditional film markets, that have been negatively affected by the pandemic and the lock-down of the economy that followed.



The traditional audio-visual market has evolved due to the dual impact of a rapidly changing and accelerated advancements in technology and the impact of the Covid19 pandemic. It is therefore imperative to craft strategies and that necessary attention is given to the survival, growth, and development of the sector in light of these changes.

The audio-visual sector also has the potential to create substantial inputs into the local economy. Furthermore, a large percentage of employment in the sector falls into the high- and medium-skilled categories. The National Development Plan (NDP) states that the arts and related creative economy sector are an asset that needs investment to provide opportunities for more people, often outside of the formal economy. Therefore, developing the local audio-visual sector can translate into the development of the local skills base, which in turn has the potential to improve living standards in the province.

The purpose of this project therefore is to focus on leveraging technology in the KZN audio visual sector to give new impetus to the sector. The ultimate objective of this project is to formulate recommendations for the KwaZulu Natal Film Commission (KZNFC) and the industry on the future use and application of technology in the sector.

The scope of work of this project is therefore extensive and will take into account the use of technology along the value chain of the sector.

### 1.1. Key Objectives

The overall objectives of the project include the following:

- a. to conduct a comparison /benchmarking exercise on the KwaZulu Natal (KZN) current status quo with regards to utilising technology in comparison to globally relevant practices.
- b. to identify areas of technological improvements that the industry can adopt (quick wins)
- c. to analyse the impact of the 4IR; 5G and COVID -19 on technology advancements in the audio visual industry
- d. to identify and measure the technological requirement needs of the KZN film sector/industry.
- e. to quantify the investment that will lead to the growth of the KZN audio visual sector and become competitive (analyse the platforms and discuss the transformation of the local industry)



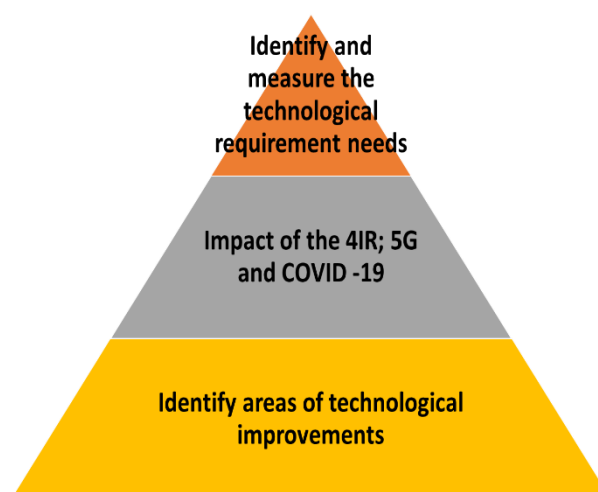
f. to develop recommendations for KZNFC and the industry.

There are three objectives of this research study that are pertinent to the primary research component of the study. They are:

- To analyse the impact of the 4IR; 5G and COVID -19 on technology advancements in the audio-visual industry.
- To identify areas of technological improvements that the industry can adopt (quick wins).
- To identify the technological requirement needs of the KZN film sector/industry

The diagram below illustrates the relationships that exists between the three objectives and how the design of the research will build one on the other.

- It is important to first establish the nature and extent of the technology changes taking place
- Secondly, one needs to determine the causes of some of the important changes taking place such as the impact of 4IR, 5G and Covid-19 and others as will be identified by the stakeholders.
- Lastly, the needs and requirements for the technology improvements will be surveyed and tested with the stakeholders through the primary research.



## 1.2. Research Approach

This approach relies on two main research techniques i.e.:

1. Desktop literature review of relevant policies and strategies as explored in the international and local markets.
2. Primary research with the key stakeholders through survey questionnaires and stakeholder interviews.

This approach is unpacked into the detailed methodology in the next subsection.

### SITUATION ANALYSIS: PRIMARY LITERATURE REVIEW AND DESKTOP RESEARCH



This report represents the Situation Analysis phase of the study. It is divided into two parts: the desktop and literature review phase and the engagement phase. The key objectives of the project that will be addressed during the situation analysis phase are the following:

- to conduct a comparison /benchmarking exercise on the KZN current status quo with regards to utilising technology in comparison to globally relevant practices.
- to analyse the impact of the 4IR; 5G and COVID -19 on technology advancements in the audio-visual industry
- to identify areas of technological improvements that the industry can adopt (quick wins)

A desktop review of key documents and websites of all public and private bodies/organisations that support the audio-visual sector will be researched and assessed in this phase. The aim of the desktop review is to find the relevant information that will aid in the development of a strategic framework to grow the KZN AV sector through leveraging on technology.

#### **SITUATION ANALYSIS: STAKEHOLDER ENGAGEMENT: INTERVIEWS AND CONSULTATIONS**

Simultaneously to the desktop research being undertaken, initial stakeholder identification will take place.

**The Engagement Model:** Stakeholder and industry engagement is a critical component of this project. Industry stakeholders (both private and public bodies/organisations) are engaged. Both national and provincial bodies will be reviewed in this phase to receive inputs into the audio-visual sector. A key focus area will be on the types of support that these bodies/organisations provide to players within the audio-visual sector.

Stakeholders will be contacted and engaged individually to obtain key data and inputs about the performance of their organisation. The interviews and engagements will be structured along the value chain to ensure that all aspects of the sector are identified and taken into consideration.

### **1.3. Outline of the report**

The outline of this report is designed to provide an overview of the current situation as it relates to technology and its impact on the AV sector in KZN.

The following will be presented after this introductory section:

- a description of the background and context for the study is given in Section 2.
- the conceptual framework which outlines the concepts of the audio-visual sector and technology in the context of this study.

- an overview of the AV sector in KZN including a comparison /benchmarking exercise on the KZN current status quo with regards to utilising technology in comparison to globally relevant practices.
- Identified trends and areas of technological improvement in the KZN AV sector
- A strategic plan that gives guidance in terms of specific actions and interventions to be undertaken to leverage on technology in the KZN AV sector

The report concludes with a section that gives recommendations and key action steps coming out of the research.

## 2. BACKGROUND AND CONTEXT

New advancements in technology as well as the changes brought on by the COVID-19 pandemic present new opportunities which the AV sector can take advantage of. This section aims to identify and highlight the main changes that have occurred in the KZN audio-visual sector due to COVID-19 as well as the technological advancements as context for the development of this study.

### 2.1. Impact of COVID -19 on technology advancements in the audio-visual industry

The audio-visual sector, like many sectors in the economy, is impacted by various factors including technology and other socio-cultural influences. The COVID-19 pandemic has had a substantial impact on the AV industry in 2020 and 2021, mirroring its impacts across all arts sectors.

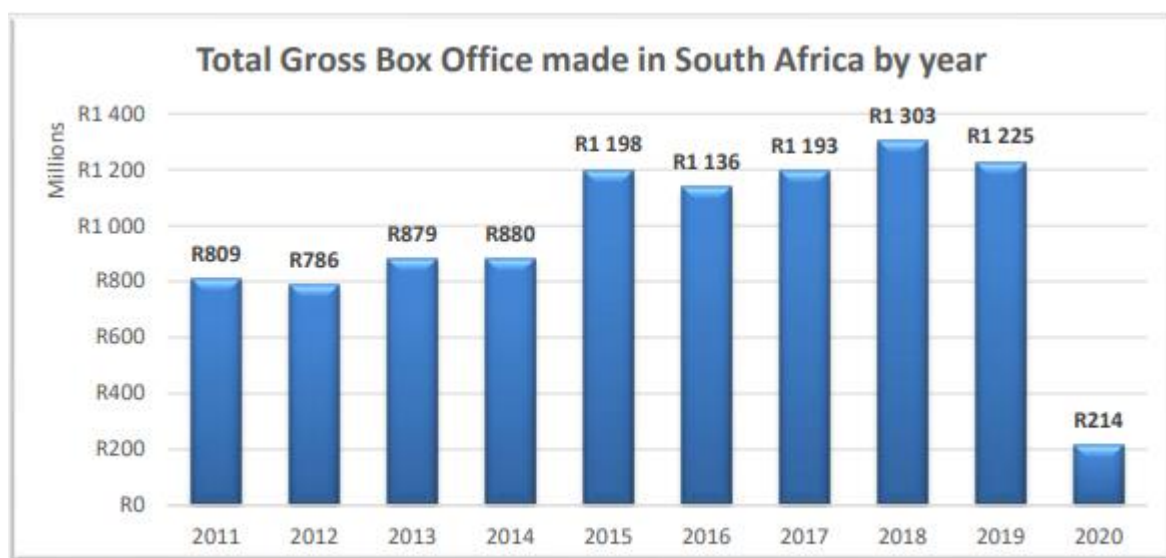
**The COVID-19 pandemic has had a substantial impact on the AV industry mirroring its impacts across all arts sectors. Some AV sectors especially the film and cinema sector have been stalled by lockdown restrictions. However, this has led to emergence of new AV markets such as the teleconferencing subsector which has rapidly expanded since 2020. Responses to Covid 19 have also fast-tracked digital adoption across the AV sector. This has resulted in a rapidly expanding virtual production and distribution market in the AV sector.**

This is especially true in South Africa which is still under lockdown restrictions while many other countries have opened up to full scale production and are providing significant stimulus measures, including increasingly attractive incentives to draw more international productions to their shores.

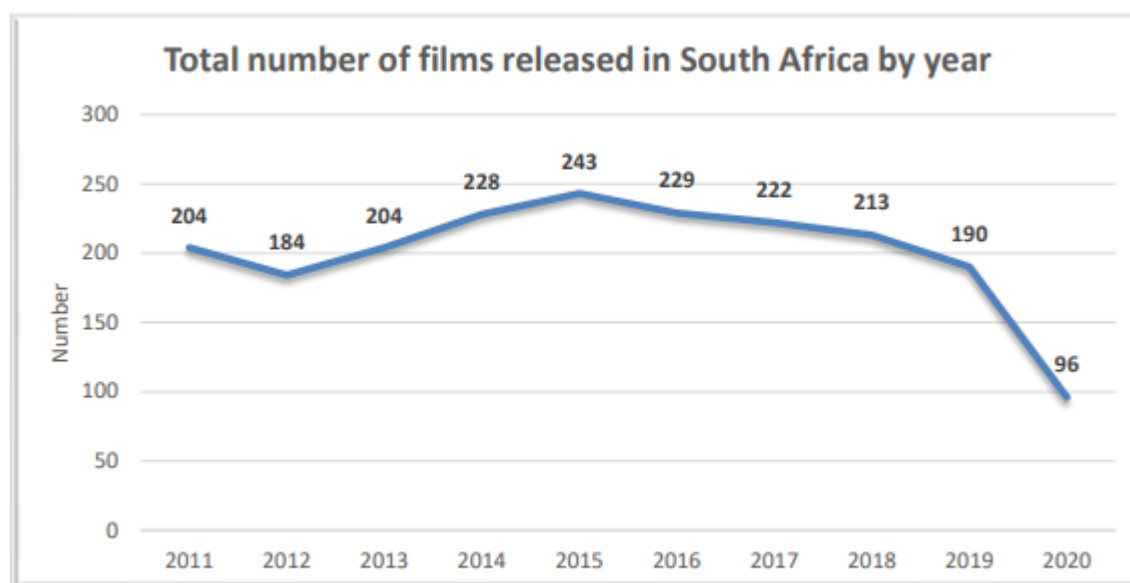
The AV sector has been forced into a hiatus by the social distancing and other lockdown restrictions causing the industry to lose momentum. An important aspect of the AV industry which has been most negatively affected by the Covid19 restrictions is the local film and cinema industry. Across KZN and to varying degrees, cinemas, movie theatres have been closed, festivals have been cancelled or postponed or gone virtual, and film releases have been moved to future dates or delayed indefinitely resulting in lost revenues from ticket sales, merchandising, advertising, and promotion.

Due to the disruptions, the global and national box office has dropped by billions of dollars and the stock of film exhibitors has also dropped dramatically. Many blockbusters originally scheduled to be released since mid-March 2020 have been postponed or cancelled around the world, with film productions also halted.

The National Film and Video Foundation (NFVF) reports that the South African box office lost as much as 83% of revenue last year. In 2019, the industry released 190 movie titles, and generated as much as R1.2 billion. While in 2020, only 96 titles were released and income from movies amounted to R200 million (NFVF South Africa Box Office Report, 2020) as shown in the graph below.



Source: Filmfinity, NFVF database



\*Source: Filmfinity, NFVF database

The cancellations affect not just the main performers or teams, but also stadium workers, businesses in close proximity and the community at large in terms of economic impact. For example Ster Kinekor, the almost 50-year-old company that operates 53 theatres in South Africa, filed for voluntary business rescue. Competitor, Nu Metro, though in good financial standing, still has not recovered to preCovid levels (BusinessTech, 2021).

While the audio-visual industry may be among the worst affected by the COVID-19 crisis, the industry has had to evolve to adjust to the restrictions necessitated by the COVID-19 pandemic. Responses to Covid-19 have fast tracked the adoption of digital technologies by several years. There has been a boost in digital media with the share of digital and digital enabled products accelerating rapidly in the sector.

The crisis has also fundamentally changed how audio-visual products are viewed and consumed, becoming 'studio' events with empty venues. Consumers have moved dramatically toward online channels with online publications seeing a significant rise in popularity. The result has been a rapidly expanding virtual production market. This, in turn, has created openings for independent cinema productions to receive wider exposure.

One sector that underscores the silver lining under the pandemic is teleconferencing. The paradigm shift towards remote work and communication has spurred the astronomical uptake of videoconferencing services such as Zoom, MS Teams, Hubbub, Figma, Mural and Around. These collaborative meeting spaces use a combination of AV and cloud-based technologies that allow several people to work and present their tasks together in real time. The teleconferencing platform Zoom records an average of 300 million daily meetings in 2021, up from 10 million in December of 2019. The period past COVID-19 will likely continue to spur the growth of the sector as 94% of business executives report that videoconferencing has increased their business productivity (Zoom Dashboard, 2021) Interactive meetings and tools to keep businesses and individuals connected are leading to massive opportunities within the AV sector.

The audio-visual industry has shown the ability to rally, sustained by resurgent demand during the Covid19 pandemic. Ultimately, consumers want to stay informed and entertained and the audio-visual industry has found engaging ways to deliver and prosper. It is imperative that the AV sector be assisted, however possible, to capitalise on these developments, opportunities in technology, and partnerships in order to optimise the potentially significant contribution the sector can make to Gross Domestic Product (GDP), Foreign Direct Investment (FDI), job-creation, transformation and promoting local stories to the widest possible audience.

## 2.2. Impact of technological advancements on the audio-visual industry

The audio-visual sector is an industry which has strong links with and is heavily influenced by changes in technology. Nearly every aspect of the audio-visual value chain, is influenced by the usage and advancement of technology to meet demand and deliver quality end products. Therefore, fully understanding the role and value of digital media technology and understanding the concept and application classification of digital media technology are key concerns of improving the audio-visual industry.

**There has been a wide range of audio visual -based developments related to digital technologies. All these technological changes have allowed for players in the AV sector to widen their potential, allowing more diverse, detailed, and dynamic ways of creating, distributing, and marketing audio visual products. Embracing new opportunities within the technological sector could give new impetus to the KZN audio visual sector. It would provide employment, promote innovation, and contribute to the KZN participation in the global AV industry.**

The history of the audio-visual industry is one of innovation and remains a major driving force behind the AV sector. With the improvement of quality of life, the demand for quality audio visual products is constantly increasing.

There has been a wide range of audio-visual based development related to digital media technology such as the use of Computer-Generated Imagery (CGI) and editing which will be discussed in greater detail in Section 4 of this report. The internet, specifically the widened accessibility of the internet through modern technology such as Fifth Generation cellular network (5G) and wifi6 has greatly influenced the AV sector value chain. Widespread implementation of the 5G and wifi6 technologies offer faster download speeds which will benefit the KZN AV sector through increased opportunities in content delivery and sharing. Production studios and providers increasingly use the internet as the main way to market products to audiences such as posting trailers online to platforms such as YouTube. This allows for cheaper and quicker distribution and marketing of material. The internet also allows for studios to create websites where audiences can access information and online extras enabling increased awareness of AV products.

Advancements in smartphone technology has allowed independent production of films, broadcasting of live videos and the sharing of content on online platforms. AV content is now also readily available through various distribution channels ( TV, computers or mobile devices) that can reach a wider audience. The potential from this mobile revolution may be seized by the KZN AV sector to create new revenue streams and create growth within the sector. However, the sector will have to be agile in order to leverage on these opportunities.

Within the KZN context, embracing new opportunities within the technology sector could give new impetus to the sector. Among other things, it would provide employment, promote innovation, and contribute to the KZN economy participation in the global AV industry. From the current development of domestic film and television animation works, there is still great room for development. Therefore, in order to quickly promote the development of the domestic film and television audio visual industry, it is necessary to combine digital media technology to innovate traditional film and television audio-visual production, and then improve the details of and quality of the film and television audio visual works.



### 3. CONCEPTUAL FRAMEWORK

In order to correctly craft interventions that are designed to leverage on technology within the KZN audio visual sector, appropriate definition and framing of the sector and technology is important. This section discusses the concepts of the audio-visual sector and technology within this sector for the purposes of this study.

#### 3.1. Framing the Audio-Visual Sector

The audio-visual sector is dynamic, multidimensional, and highly integrated. Audio visual products and services include sequences of related images, irrespective of length, intended to be shown as a moving image through the use of devices, regardless of the medium of initial or subsequent fixation, and for the public exhibition including film and video recordings, animation and documentaries for exploitation in theatres, television, DVD or any new forms of distribution (La Torre, 2014).

The KZN audio-visual industry encompasses a range of creative production activities characterised by products containing moving images and sound including film, TV and documentary production, commercials, stills photography internet content and multimedia.<sup>1</sup>

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***A simple framing of the audio-visual sector is all electronic media markets possessing both a sound and visual component. The audio-visual sector thus encompasses a range of creative production activities including film, TV and internet-based content creation, and multimedia.***

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The nature of the production, the scope and feature of the products, as well as the way products can be broadcasted and distributed, identifies different audio-visual markets or sub sectors. It is possible to categorize four main audio-visual markets namely:

- ❖ Broadcasting/TV,
- ❖ Cinema/film,

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<sup>1</sup> Electronic media are media that use electronics or electromechanical means for the audience to access the content e.g. [video](#) recordings, [audio recordings](#), [multimedia](#) presentations and [online](#) content. Most new electronic media may be in either [analogue electronics data](#) or [digital electronic data](#) format<sup>1</sup>

- ❖ Multimedia, and
- ❖ Web/internet market.

Table 1: Delineation of the audio-visual sector

The Audio Visual Sector in KZN	
AV markets/sub sectors	AV products
TV	TV and radio broadcasts Pay-per-view Video-on-demand
Cinema/Film	Exhibitions in theatres Live theatre Home viewing (DVDs) Video games and accessories relating to film
Web/Internet	Free Content Creator Platforms/Apps Subscription Online Streaming Services Social Media Apps Livestreaming Services
Multimedia	Teleconferencing Platforms Cloud based collaboration platforms Short form animation Motion graphics Animation Advertising Games Virtual Reality

**Framing the Audio-Visual Sector**

AV is **electronic media** possessing **both a sound and a visual** component

It is a dynamic sector that has evolved significantly in recent years owing to technological developments

It covers the film, broadcasting (television and radio), internet and multimedia markets across various stages of the value chain life

The structure of the AV industry is highly integrated, multidimensional and complex

Source: Debande and Chetrit. 2001. *The European AV industry: an Overview*.

These industries are broadly divided into various stages of activity, representing the production and commercialisation life cycle: Development; Production stage covering pre-production and post-production including editing; Distribution stage covering packaging and transmission to the viewers by various delivery technologies; and finally, the Exhibition and broadcasting stage.

Different players such as content providers, right-holders, content distributors, operate in the value chain from the production of content such as films, TV programmes or music to its delivery via cinema, TV channels or Internet portals.

Table 2: Delineation of Audio-Visual activities

DELINEATION OF AUDIO-VISUAL ACTIVITIES
Motion picture, video and television programme production
Motion picture, video and television programme postproduction
Motion picture, video and television programme distribution
Motion picture projection activities
Television and radio programming and broadcasting activities
Artistic creation
Music and video recordings
Publishing of computer games and accessories

Source: La Torre, Mario. *The Economics of the Audio-visual Industry: Financing TV, Film and Web*. Basingstoke: Palgrave Macmillan, 2014.

The sector is important for the pursuit of governments' economic and other objectives. The sector stimulates growth, generates substantial employment, brings in valuable foreign exchange and acts as an important means through which technology is transferred and the skills base is upgraded. The industry generates jobs directly in companies involved in the direct value chain and it generates many more jobs indirectly in the support and hospitality industries, stimulating business in hotels, catering companies, restaurants, and transport providers. It is also one of the best forms of promotion. The NFVF 2021 Economic Impact of the South African Film Industry report shows a marked growth in the KZN film industry from 9% of total film activity in South Africa to 12% of total industry share. In addition, the industry creates 5.65 jobs per R1 millions of expenditures and is known to be a catalyst of economic growth with an economic multiplier of 2.8.

As a medium, the AV sector plays an important role in communicating ideas and providing information. A thriving, independent audio-visual industry helps foster democracy through engendering debate and providing political commentary. In addition to being a contributor to the economy and employment, it also is a major driver of the creative industries that are the future of modern economies and the fourth industrial revolution. It is one of the main guarantors of the province's diversity and creativity, and of the preservation of the cultural and linguistic diversity of local KZN communities.

The national and the provincial KZN government is aware of the importance of the industry. However, both the extent to which it impacts growth and employment, and the extent to which it is losing competitiveness may be less obvious. Highlighting the importance of a study such as this.

### 3.2. Framing technology in the context of the audio-visual sector

The recent digital wave has led to the combination of film production and computer technology and a revolutionary change has occurred in film production process and audio-visual effect. Digital technology is the engine of the audio-visual industry thus, the expression of film and television and other audio-visual products has been enriched greatly. Digital

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***Technology in the audio-visual context refers to the plethora of hardware or software that is used to record and transmit audio and video signal that can change the status quo of the audio-visual sector through innovation and improved efficiency and quality of products.***

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technology embraces digital electronics, and utilizes certain equipment to transform pictures,

text, sound, image and other information into binary digits that can be recognized by an electronic computer, which then computes, processes, stores, transmits, spreads and distributes this information (Hu, 2016).

Digital technology in this paper refers to all computer technologies applied in the audio visual sector. It can be divided into two:

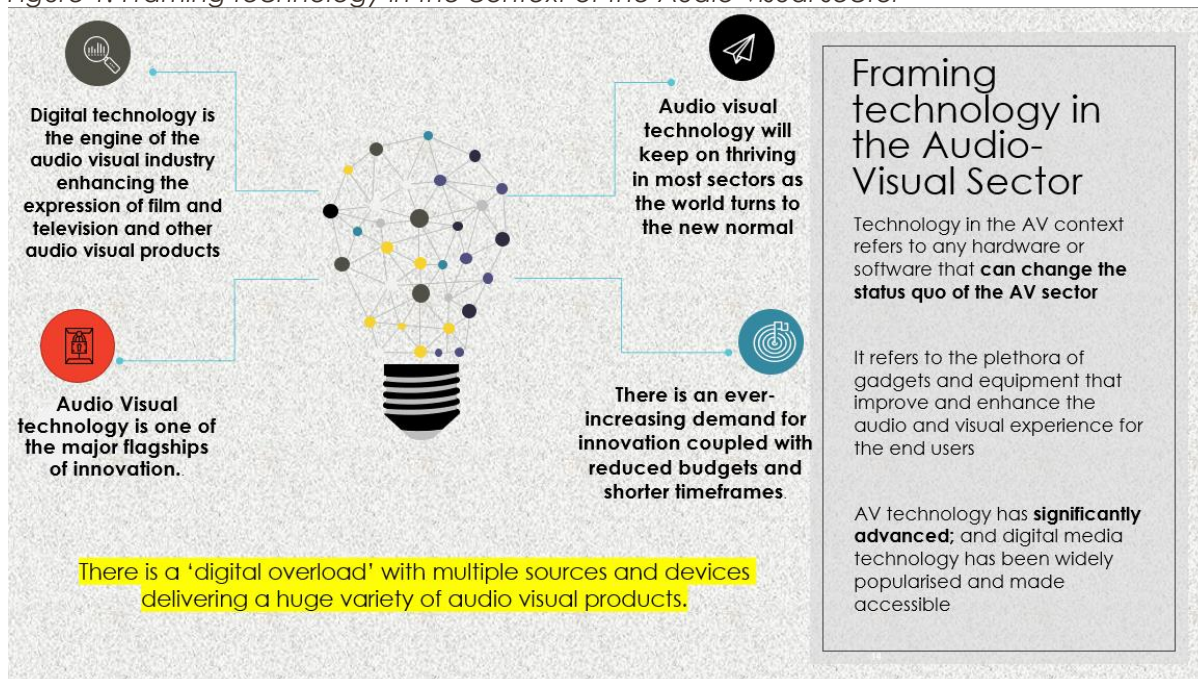
- i. technologies that are used to produce the film itself, that is digital graphic processing technology based on computer graphics, including digital imaging, HD technology, non-linear editing, and scene design;
- ii. digital film transmission technologies represented by digital video, network, digital distribution and digital projection (Hu, 2016).

It refers to the various technologies, the plethora of gadgets and improvements that are used to record and transmit audio and video signal and can change the 'status quo', improve and enhance the audio and visual experience and develop content and consume audio visual products and services for the users.

AV technology has significantly changed over time. Developments in both audio visual and information technology (IT) are leading to a convergence of the two sectors. In the current era full of computer high tech technology, digital media technology is the most commonly used creative means in the audio-visual field. Using digital media technology combines artistic works with innovation for increased quality of products.

A series of new digital media technology is now widely used in 3D animation, 3D printing technology computer graphics technology (CGI), digital audio synthesis technology, digital processing technology, electronic digital information technology, virtual technology and all digital film including shooting, downloading and showing thus bringing new audio-visual experiences. In addition, digital media technology also involves all aspects of current social life.

Figure 1: Framing technology in the context of the Audio-visual sector





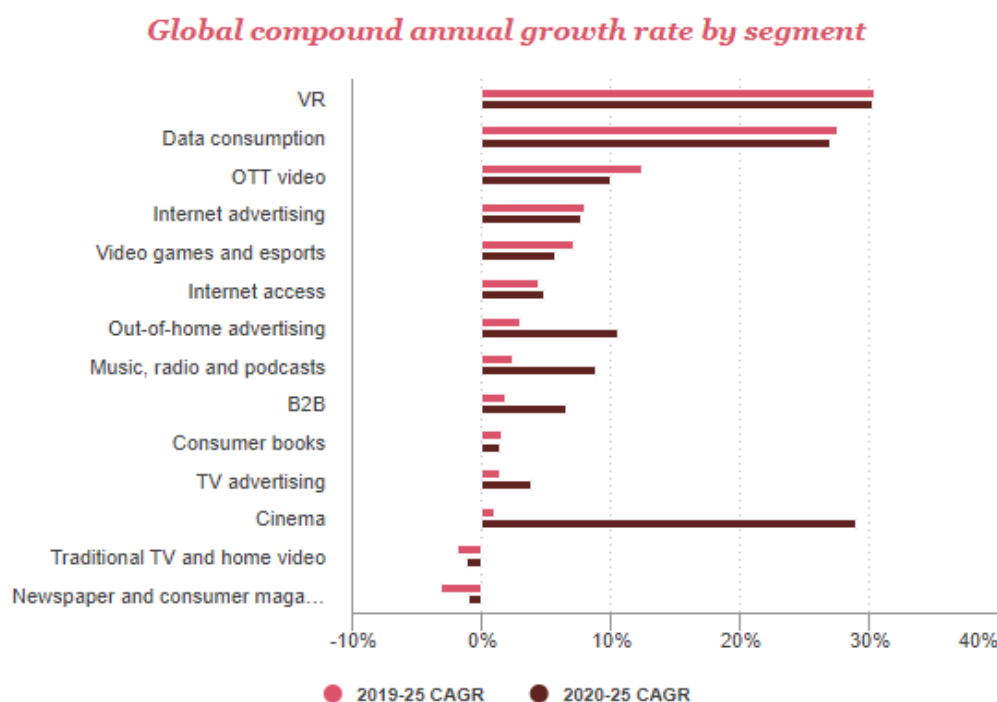
#### 4. SITUATION ANALYSIS

Over the past 20 years, there has been a drastic change in the way in which audio-visual content is consumed owing to rapid digitisation and advancements in technology. General trends in the consumption of audio-visual content indicate that:

- Cinemas are declining in terms of patronage, ticket sales and revenue.
- DVD sales are declining.
- TV, Cable TV/satellite market is relatively stable.
- Subscription Video-on-demand [VOD] streaming platforms (Netflix, Disney+, Showmax Hulu, AppleTV) are growing in popularity and usage
- Internet and social networks are a rapidly expanding market
- Smart mobile devices are now becoming an ever-increasing distribution network.

The way in which audio-visual content is being produced and distributed is changing because of the demand for access to unlimited content for consumption via online platforms, and other platforms such as video-on-demand, which has had an impact on film exhibition, as home video continues to grow.

Globally, the PwC Global Entertainment & Media Outlook 2021–2025 report on Media: Technology, Media & Telecommunications, digital formats are the leading segments within the audio-visual market with VR projected to have the largest global growth as depicted in the figure below.



Source: PwC Global Entertainment & Media Outlook 2021-2025

Interestingly, cinema is forecast to be the fastest-rising segment globally, although this is mostly driven by the rebound in 2021 coming from a very low base in 2020. These and other trends will be further unpacked in the following subsections.

#### 4.1. Overview of the KZN Audio-Visual Sector

Nationally, of all the creative content industries, the Audio Visual and Interactive Media industry was the largest sector. The sector contributed R38 billion of the GDP contribution of the creative content industries in 2018 (Masterplan Research, Nelson Mandela University, November 2020). It is also a major driver of the creative industries that are the future of modern economies and the fourth industrial revolution. It is one of the main guarantors of the province's diversity and creativity, and of the preservation of the cultural and linguistic diversity of local communities.

##### Opportunities

The audio-visual sector is an asset to the local KZN economy that has the potential to provide opportunities for local economic development. This sector has significant potential to contribute to the province's economic recovery and growth. It creates thousands of jobs, from world-class cast and crew to new unskilled entrants to the workplace who can create a sustainable successful career in the industry (playing a meaningful role in the NDP 2030 goals); it attracts billions in foreign direct investment; it rapidly injects capital throughout the economy (67% of production spend flows to other sectors, the bulk of which is spent during the shooting period of the production); throughout the value chain and supplier network it contributes substantial taxes; the immense 'soft' but the critical value of promoting local stories, national identity and culture, locally and globally, which only this sector can do; and it promotes brand KZN. The AV sector is unique in its capacity to deliver the following:

- It has a large labour footprint, and it can quickly create jobs, from technical to unskilled. Employment created through each production can run into hundreds, and includes among other roles actors and actresses, make-up artists, lighting technicians, hairdressers, caterers, and sound technicians.
- According to the NFVF Economic Impact of the South African Film Industry Report (2021), the industry creates 5.65 jobs per R1 millions of expenditure. In 2020/21 a total 12 775 full time equivalent jobs were created/sustained by the activities of the film industry in South Africa. Based on KZN's 12% share of the national film industry, approximately 1 533 of these jobs were created/sustained within the KZN film industry (NFVF Economic Impact of the South African Film Industry Report, 2021)

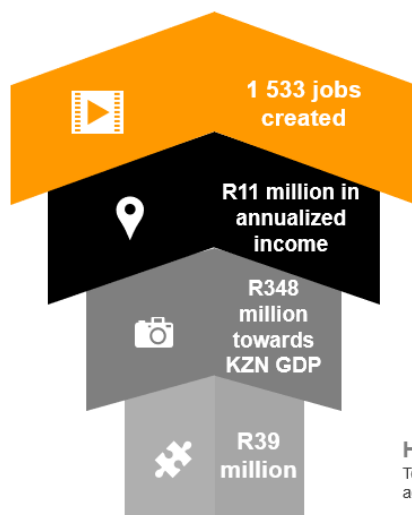


- In addition, annualised income derived by employees as a direct, indirect, or induced impact of the film industry amounted to R218 million for South Africa in 2019/20, declining to R88 million in 2020/21. Which translates to about R11 million accruing to KZN employees in the film industry (NFVF Economic Impact of the South African Film Industry Report, 2021)
- Generates local economic activity including subsequent multiplier effects on the local gross domestic product (GDP) through the sectors multiple backwards and forwards linkages. The industry is known to be a catalyst of economic growth with an economic multiplier of 2.8. As such it can generate employment and bring in valuable foreign exchange (KZNFC Annual Performance Plan, 2021/22).
- In total, the direct, indirect and induced economic impact of the film industry on the South African economy has been estimated at R7.2 billion in 2019/20, declining to R2.9 billion in 2020/21 due to the negative impact of Covid-19. Of this total, 12% which is approximately R348 million can be attributed to KZN (NFVF Economic Impact of the South African Film Industry Report, 2021)
- Households benefited to the tune of R803 million in income in 2019/20 because of the activities of the film industry, however, this declined to R326 million in 2020/21. Of that total household benefit, R39 million accrued to KZN households (NFVF Economic Impact of the South African Film Industry Report, 2021)
- attracts investment including foreign direct investment (FDI)
- Semi- and unskilled people can learn, acquire skills, and develop a career path
- It plays a vital role in preserving and telling of local heritage, cultures, and local stories
- Promotes tourism locally and internationally
- Creates work for other creatives, such as music (from composition to performance), visual arts, graphics and other design and other small business/individual suppliers such as hairdressers, dressmakers, cooks and wait staff, drivers.
- In addition to these impacts on the economy, the industry also contributed intangible benefits that accrued to the wider economy and society, including destination profiling/marketing and tourism, skills development, contribution to social cohesion and development of local content among others (NFVF Economic Impact of the South African Film Industry Report, 2021)

## The KZN AV sector is brimming with opportunities

The audio-visual sector is **an asset to the local KZN economy** that has the **potential to provide opportunities** for local economic development

- Can quickly create jobs
- Has large multiplier effects on local GDP
- Is a catalyst for local economic growth
- Attracts investment
- Preserves local heritage through telling local stories
- Creates work for other creatives
- Brings in tourism



### JOB CREATION

The industry creates 5.65 jobs per R1 million of expenditure

### ANNUALIZED INCOME

Income derived by employees as a direct, indirect or induced impact of the industry

### ECONOMIC DEVELOPMENT

The industry has an economic multiplier of 2.8 which generates local economic development

### HOUSEHOLD IMPACT

Total household benefit because of the activities of the industry

Overall, the economic impact assessment shows that South Africa has a vibrant film industry that is contributing meaningfully to the economy and is brimming with the potential to make an even greater contribution. Therefore it follows that, developing the local AV sector in KZN can translate into the development of the KZN economy and the widening of the local skills base, for improved living standards and economic development in KZN

## Challenges

However, the sector is also facing a number of challenges including:

- Underdeveloped ICT infrastructure in many parts of KZN. Private and government intervention is needed to develop the necessary broadband infrastructure
- There is a lack of sufficient funding programmes and supporting structures in the AV sector
- a widening skill gap
- There are limited apprenticeships and other work-based learning programmes and opportunities for the youth in the industry
- Funding institutions need to reassess their criteria to offer support to more digital content producers
- Local content creators need to improve their technical knowledge and understanding of new technology platforms and develop skills to use them; training in this regard must become a priority

- The new internet-based platforms are to a large extent “free access” therefore new revenue models need to be created to harness revenue streams from these
- The sector is very attractive to the youth however many youths do not find it sustainable in the long run due to high operational costs, lack of funding and lack of sufficient skills
- The workforce is predominantly young, but the majority is underpaid and cannot be economically independent
- The statistical data relating to the industry is poor. Statistics South Africa does not have comprehensive figures and little independent research has been conducted. As a result, the sector has very low levels of sector-specific market intelligence

These issues are unpacked in greater detail below.

The KZN AV sector is an attractive sector to the youth especially within the internet or web-based content creation due to its appeal in terms of gaining a following (going viral). However, sustained youth participation in the sector is on the contrary low. Many of the youth become involved in the sector due to its appeal however, they often drop out or choose to participate informally.

Much of the AV sector in KZN is dominated by family businesses and older generation participants. This phenomenon could point to a larger problem in terms of the sustainability of the industry in KZN. The workforce is predominantly young, but the majority is underpaid and cannot be economically independent.

The sector is also plagued by issues of underfunding. There is a lack of sufficient funding programmes and supporting structures in the AV sector. The sector is mostly dependant on state funding. There are numerous ministries, departments and national public entities that are involved in the development and funding of the audio-visual content industry, which are not effectively co-ordinated resulting in creatives and aspirant independent producers having to navigate through to find funding for their projects. The private sector investment is very limited in the sector as it is considered a high-risk low return investment.

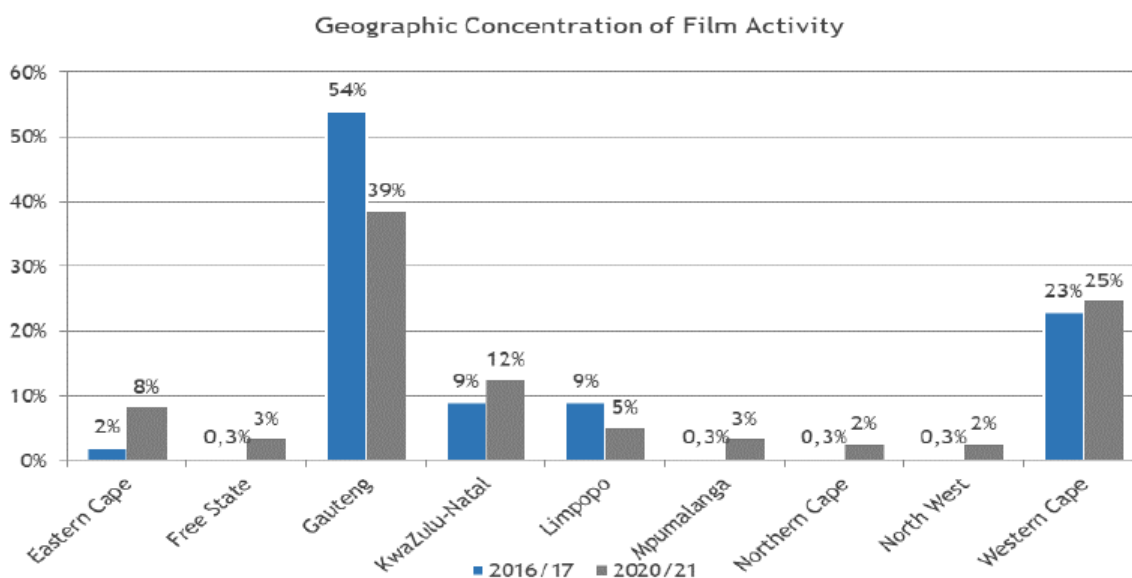
The sector is also contending with a widening skills gap. Given the dynamic and ever-changing nature of technology in the AV sector, the skills gap continues to widen. There are limited apprenticeships and other work-based learning programmes and opportunities for the youth in the industry. Private foundations and other stakeholders are partially filling the gap in relation to skills development, but this is not enough in order to fill the gap of skills in the sector.

The statistical data relating to the film industry is notoriously poor. Statistics South Africa does not have comprehensive figures and little independent research has been conducted. As a result, the sector has very low levels of sector-specific market intelligence. Nevertheless, by combining, contrasting, and updating the few figures that do exist, and supplementing these with information gleaned in interviews, it is at least possible to obtain an idea of the scope of the industry. It is vital, however, that a more comprehensive government-backed industry analysis be conducted in the near future.

The following subsectors outline in greater detail the recent trends within each of the AV sector submarkets.

#### 4.1.1. Film/Cinema

Before the adverse effects of COVID affected the film industry, the industry in KZN was experiencing steady growth. The Durban Film Office (DFO), the film promotion arm of the eThekweni Municipality, reports that between 2017 and 2020 local production activity soared by 41% (eThekweni, 2021). According to the KZNFC, the KZN film industry is seeing positive growth year on year. The NFVF 2021 Economic Impact of the South African Film Industry report shows a marked growth in the KZN film industry from 9% of total film activity in South Africa to 12% of total industry share as depicted in the figure below.



*Source: Film Industry Stakeholder Survey, 2021*

In 2017 and 2019, KZNFC- partly funded films have been the highest-grossing local films at the South African box office, earning over R17 million and R18 million respectively. This results in capital recoupment flowing back into the KZNFC, allowing funding of more projects (KZNFC Press, 2020). KZN also produced other noticeable productions. Keeping up with the

Kandasamy's, broke box office records making over R20 million. Other notable productions in KZN include Deep End and Beyond the River.

The number of participants in the sector has grown and there is improved coordination and introduction of basic infrastructure in the form of the KZN Film Cluster. An increasing number of filmmakers are recognising KZN as an attractive location for film production due to its favourable climate, scenic landscapes, and diverse cultures. According to research conducted by Olsberg (2020), the growth in interest for basing production in KZN is attributed to several factors, such as:

- The strong cultural heritage of the province.
- Favourable climate conditions of the province.
- Scenic landscapes and well-known tourist attractions
- monetary and non-monetary support offered to film industry participants by institutions such as the KZNFC and Durban Film Office.

Consequently, there has been notable growth in the province's film sector in the last five to ten years (Olsberg, 2020). The province of KZN has the third largest film industry, consisting of 12% of South Africa's film businesses and operations. Although it lags behind other provinces, such as Gauteng which controls 39% and the Western Cape at 25%. Provinces such as Gauteng and the Western Cape have access to the latest filming infrastructure which enables these provinces to continue to dominate the South African film industry.

The KZN film industry however has a unique opportunity to grow. This is because of its competitive advantage based on the province's cultural diversity, underpinned by its racial and ethnic diversity, including the Zulu cultural trademark (NFVF 2021). However, there are a handful of factors that continue to inhibit the growth and development of the sector, namely:

- A shortage of skilled film crews and supporting infrastructure.
- Safety and security issues
- Local films are poorly distributed.
- Audiences have poor access to local films.
- A relatively small talent pool compared to the other two main film producing provinces, namely Gauteng and the Western Cape, especially with respect to scriptwriters and actors (KZNFC, 2019).

The biggest challenge currently inhibiting the KZN film industry's growth is a combination of the skills gap and a lack of film studios. Over and above its bursary programme, the KZNFC has invested, on average, R5 million per annum towards the development of local filmmakers through free industry workshops and training programmes. There is still an issue of retaining

talent in the province, as there are not enough productions to employ young filmmakers, but as the industry grows and local film producers shift towards producing made-for-TV content, the expectation is that this will begin to change. The KZNFC funding conditions ensure that local businesses and crew participate in the productions through a minimum of 50% production budgets being spent in the province.

Film festivals and film markets are two platforms that have the potential to address many of these constraints; they provide exposure to local film producers, create networking opportunities for local industry stakeholders, provide skills development opportunities through associated initiatives, and enhance the distribution of locally produced content, amongst others. It is for this reason that the promotion, growth, and development of film festivals and markets are incorporated into KZNFC's intervention strategies.

Due to the effects of the hard lockdown in 2020, the number of films shot in Durban decreased by 48% from 2019 levels (DFO, 2021). While other genres of film production decreased in 2020, the number of permit-holding music videos shot in Durban grew from 19 in the previous year to 22 in 2020 (DFO, 2021). This growth is attributed to the City's attractiveness to music video producers and an increase in film houses following protocol in applying for permits before filming.

As the film/cinema sector tries to emerge from the problems of the pandemic, and as the world moves increasingly towards digital content platforms, it has become imperative for the film sector to receive adequate support for the ultimate benefit of the province.

#### **4.1.2. TV/Broadcasting**

Television broadcasting had begun to expand dramatically even before the Internet went 'public' and the switch from analogue to digital transmissions systems has created opportunities for further growth in terms of content volumes.

The PwC Global Entertainment & Media Outlook 2021–2025 reports that globally, in terms of consumer spending, traditional TV and home video takes the largest share of total revenue, although it will contract at a 1.2% CAGR to 2025. According to PwC Africa Entertainment and Media Report 2019 – 2023 South Africa's total TV market revenue (defined as revenues from pay-tv subscriptions, physical home video, public licence fees, OTT video and TV advertising) grew 3.5% year-on-year to R33.5 billion in 2018, making the country by far the largest television market on the African continent. While still vulnerable to political and economic instability, the TV market will grow at a 3.9% CAGR over the next five years, producing total revenue of R40.5 billion in 2023. The television platform is key to the growth of the film sector, particularly, the

open channels. It is through the television platforms that the emerging filmmakers can reach their target audiences (PwC, 2019-2023 report).

The ground-breaking Greater Durban Television (1995) was the first community television station to go on air in South Africa. This experimental project placed Durban at the forefront of efforts to establish permanent community television stations in South Africa. However, since then, television has experienced some innovations in Durban. A local television format, KZN-2-NITE, provided an experimental facility for trainees entering the industry and indicated that KZN has the facilities and talent to run a television station.

However, over the past 10 years, KZN has also seen an increase in production studios setting their base for television production in the province which has led to many well-known industry faces relocating to KZN to become part of new productions which are based in the province (NFVF, 2021). KZN is home to three popular telenovelas namely, Uzalo, Imbewu: The Seed and Durban Gen.

Uzalo is the most-watched show in the country with 6 679 581 million daily viewers in September 2021. The third most watched soapie on e.tv is Imbewu: The Seed with 3 839 841 million daily viewers. Whilst Durban Gen is the fourth most-watched telenovela with 2 330 467 daily viewers on e.tv. All are shot on location entirely in KZN (Broadcast Research Council of South Africa, 2021).

1KZNTV is a proudly Zulu community television channel based in KZN where individuals and groups within the community produce, manage and broadcast their own television programs that are focused on local and current content. It currently broadcasts on DSTV Channel 261 or on StarSat Channel 486 or on Vodacom mobile Voda-Play.

New technologies, which give television viewers more control over their viewing, are threatening to change the structure of free to air (FTA) television with important ramifications for the television advertising production industry. Television has to evolve to engage with fresh public expectations. Consumers are managing their own media consumption by way of smartphones and an expanding array of devices, by curating their own personal selection of channels via over-the-top (OTT) <sup>2</sup>services and via smart homes and connected cars.

Television services have largely migrated onto the wired and wireless internet. In addition, television sets are becoming more computerised allowing for the more advanced interactive

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<sup>2</sup> Over the Top (OTT) services refer to any type of video or streaming media that provides a viewer access to movies or TV shows by sending the media directly through the internet. Also known as Video-On-Demand (VOD). Some of the most popular OTT providers include Netflix, Amazon Prime Video, and Hulu



functionality of the kind more closely associated with internet access. In essence these distinctive technologies will eventually merge in terms of their functionality and permit access to similar ranges of applications and content. As a result, the future of traditional television broadcast services has changed dramatically.

#### **4.1.3. Multimedia**

This is a broad subsector of the AV sector covering a number of niche markets including, Virtual reality (VR), electronic media and digital streaming.

VR, also known as immersive multimedia or computer simulated reality is a computer technology that replicates an environment in a way that allows the user to interact with it (HU, 2016). It remains a niche category, but the industry is slowly overcoming certain challenges such as content availability, comfort, compatibility, and affordability. This sector continues to attract significant investment from major media and technology companies that are eager to seize a share of this fast-growing market. It presents a gap which the KZN AV sector could take advantage of in conjunction with private sector and international partners.

Other electronic media markets that are gaining popularity especially due to the pandemic social distancing restrictions are e-sports. Total e-sports revenue is forecast to reach R138 million in 2023, a 24.7% CAGR rise from the R46 million recorded in 2018 (PwC Africa Entertainment and Media Report 2019 – 2023). While digital music-streaming providers continue to gain traction among consumers. Digital music streaming revenue reached R325 million in 2018, up almost 57% year on year. Streaming revenue is set to increase at a 20.1% CAGR to total R815 million in 2023 (PwC Africa Entertainment and Media Report 2019 – 2023)).

#### **4.1.4. Internet/Web**

Globally, pandemic lockdowns made home entertainment effectively the only choice, with internet access an essential. In total, 1.1bn households had fixed broadband in 2020; and a further 4.6bn smartphone connections. Total data consumption increased 30% during the year and consequently set off a new, higher forecast growth trend. Increasing connectivity and speed sustained the audio visual industry in 2020, as OTT video, video games and internet advertising showed above-average rises (PwC Global Entertainment & Media Outlook 2021–2025).

Web series have risen in popularity due to their creative spontaneity, as well as ease of access because of the short duration and 'free' apps and platforms. Since web platforms have the possibility of going viral, they foster large volumes of short form content being mass produced

daily across various platforms. Audio-visual internet or web products, typically, have a short duration, with limited number of episodes.

The creative freedom of the web has encouraged the increase in the number of product types, many of them which cannot be categorized based on traditional cinematographic genres. On the contrary, they can be categorized based on their specific format therefore, web series represent an innovative element.

## THE KZN AUDIO VISUAL SECTOR

Unique opportunities exist in **Virtual Reality** technology and **electronic media markets** such as e-sports **forecast to reach R138 million in revenue** nationally

### MULTI MEDIA

### INTERNET

an **innovative element** with the possibility of **going viral** large volumes of short form content being mass produced daily across various free platforms



### FILM

It is the **third largest film industry** in South Africa And is showing steady growth growing from 9% of total film market share to **12% market share**

### TV

3 popular telenovelas shot entirely in KZN **Uzalo is the most watched show** on SABC1 **averaging 6.6million views** **Imbewu and Durban Gen** are the third and fourth most watched shows on etv with **3.8 million and 2.3 million views respectively**

In conclusion, against the backdrop of an ever-increasing demand for local quality content the AV industry provides incalculable value in shaping the shared KZN narrative, reflecting and affirming people's lived experiences and stories.

Table 3: Quick wins for KZN in the AV sector

AV SUBSECTOR	QUICK WINS FOR KZN
<b>TV/Broadcasting</b>	<p>Increase in production studios setting their base for television production in the province which has led to many well-known industry personas relocating to KZN to become part of new productions which are based in the province</p> <p>KZN is home to three telenovelas with Uzalo being the most watched show in the country with over 6 million daily viewers</p> <p>TV, Cable TV/satellite market is relatively stable</p> <p>Television services have largely migrated onto the wired and wireless internet</p>

	<p>Subscription Video-on-demand [VOD] streaming platforms (Netflix, Disney+, Showmax Hulu, AppleTV) are growing in popularity and usage</p> <p>The digitization of broadcasting, particularly the switch to digital terrestrial television (DTT), promises significant opportunities to boost the development of the audio-visual sector.</p> <p>It also offers an opportunity for TV licensing authorities to require TV broadcasters to meet quotas for locally produced content</p> <p>SA's satellite distribution system is probably the best on the continent, giving access to more digital and streaming content</p>
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**KZN should continue to capitalise on these opportunities especially in OTT services with KZN producing more offerings on these platforms and more digital platforms ramping up their acquisitions of film titles**

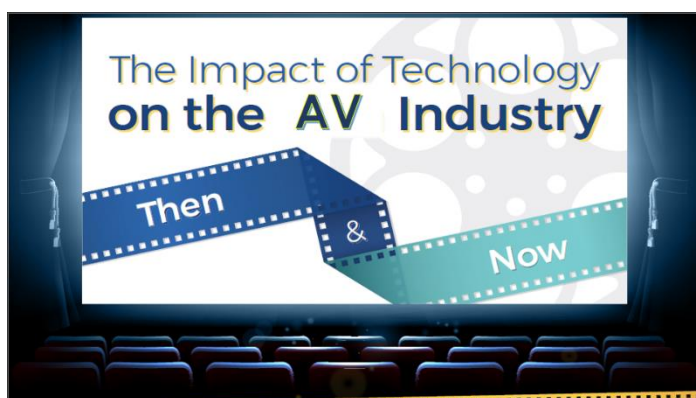
<b>Film/Cinema</b>	<p>The KZN film industry has a number of competitive advantages including the:</p> <ul style="list-style-type: none"> <li>• The strong cultural heritage of the province underpinned by its racial and ethnic diversity.</li> <li>• Zulu cultural trademark</li> <li>• Favourable climate conditions of the province.</li> <li>• Scenic landscapes and well-known tourist attractions</li> <li>• monetary and non-monetary support offered to film industry participants by institutions such as the KZNFC and Durban Film Office.</li> </ul> <p>However, since the pandemic, cinemas are declining in terms of patronage, ticket sales and revenue.</p> <p>The traditional film markets have been marred by a declining box office and decline in number of films produced with most film exhibitions becoming 'studio' events with empty venues.</p> <p>Consumers have moved dramatically toward online channels with online publications seeing a significant rise in popularity. The result has been a rapidly expanding virtual production market. This, in turn, has created openings for independent cinema productions to receive wider exposure.</p>
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**It is therefore recommended that the focus shift away from traditional film and cinema markets and traditional film festivals and use technology to fill the gaps on socially distant shoots, virtual production studios, digital marketing and distribution via the internet and OTT services**

<b>Internet</b>	<p>Internet and social networks are a rapidly expanding market</p> <p>Smart mobile devices are now becoming an ever-increasing distribution network</p> <p>The ability to film and upload content using a phone has already dramatically impacted the industry by allowing anyone to create their own independent projects without a lot of overhead or technical knowledge</p>
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	<p>The sector is very attractive to the youth</p> <p>Switch to internet-based operations allowed increased access and variety</p> <p>Content producers can now distribute content independently and directly to consumers via the internet</p> <p>The creative freedom of the web has encouraged the increase in the number of product types, many of them which cannot be categorized based on traditional cinematographic genres.</p> <p>The potential from this mobile revolution may be seized by the KZN AV sector to create new revenue streams and create growth within the sector</p>
<p><b>The internet is a rapidly growing and expanding market however it is largely free access making revenue generation from this market very difficult furthermore due to underdeveloped ICT infrastructure in many parts of KZN private and government intervention is needed to develop the necessary broadband infrastructure before this sub sector can be fully taken advantage of in KZN</b></p>	
<b>Multimedia</b>	<p>This digital space was already on an upward trajectory even before Covid19 brought on 'the new norm' but has now seen rapid expansion</p> <p>Globally, digital formats are the leading segments within the audio-visual market with VR projected to have the largest global growth</p> <p>Other niche markets popularised by the new norm include the E-sports' market, digital eventing and live streaming</p>
<p><b>Still a relatively niche category, but continues to attract significant investment and should emerge in future as a rapidly expanding market in KZN however presently given current market conditions (low levels of internet penetration in KZN, wide skills gap and low infrastructure) it will emerge as a future sector of the province</b></p>	

#### 4.2. Overview of technology in the Audio-Visual Sector



Just as it has for several other industries, technology has completely changed the audio-visual industry value chain from production of content, to editing, and distribution.

Among the various impacts of technology on the audio-visual industry qualitative aspects like the migration

from analogue to digital broadcasting should be accounted for. This digital space was already



on an upward trajectory even before Covid19 brought on 'the new norm' but has now seen rapid expansion. The advancement of digital technology has led to change in audience behaviour who now expect to access content anywhere, anytime, and on any device. From the perspectives of the consumer also, new screening interfaces like VR headgears, 3D spectacles, mobile screen movie watching and connected movie watching experience across multiple screen interfaces have completely transformed the experience.

Technology has simplified several AV processes. For example, cameras had to have a full crew to operate, and to get an aerial shot, an aircraft-mounted heavy camera was necessary. Once the film was captured, editing was done by physically cutting and pasting the film together which resulted in low-quality images. Today, new, lighter cameras have allowed for clearer images, and better shots. With the incorporation of cloud editing, editing has become streamlined. Teams from across the globe can work together from anywhere giving new opportunities to producers. For audiences, the upsurge of user-generated content on the internet and original content produced by subscription video on demand platforms have allowed increased access and variety.

Another big impact of technology has been in commerce and marketing. Owing to new online distribution channels like YouTube, Netflix, and several others, the industry is now more multifaceted.

The following are some of the new technologies within the AV sector.

#### 4.2.1. Some new technologies in the audio-visual sector:

Filming	
 <p><b>Then</b></p> <p><b>Aerial Shots</b> in 1909 used an aircraft-mounted camera to capture shots from the skies. The camera was so heavy that it actually weighed more than the plane.</p> <p>Audiences were able to see the edges and of <b>props and sets</b>, creating an unrealistic viewing experience.</p>	 <p><b>Now</b></p> <p><b>Drones</b> use algorithms on filmmaking techniques (shot sizes, viewing angles, and screen position) to capture the best shot.</p> <p><b>3D printing</b> has led to props and sets that have higher quality and resolution, scalability, speedy turnaround times as well as easy customization.</p> <p><b>3D printed objects</b> interact with actors realistically by virtue of actually existing in physical space, unlike CGI.</p>



## Drones

Image 1: Drone



Drones are a useful technology to help shoot panoramic or bird's eye-view shots at a lesser cost and involving much fewer complexities. Drones can capture shots that are difficult, if not impossible, for a regular cameraman to get.

### Autonomous Drones

These are sentient drones with built-in knowledge and algorithms on filmmaking techniques (shot sizes, viewing angles, and screen position) to corrective obstacle avoidance and open-source technology. These drones are able to maintain the framing of aerial shots with little input needed from the ground.

### Drone goggles

They enable users to control the drone through head movements. This development in drone technology pushes the boundaries of camera control, shooting and the future of VR through cutting costs and increasing production efficiency whilst significantly increasing quality of end products.

### 3D Movie Technology

3D technology has progressed to where 3D viewing experience is possible without any external spectacle or gadget.

### Smartphone filmmaking gear

The market and industry is shifting to accommodate up-and-coming iPhone and smartphone filmmakers with new and innovative gear and technologies. For example, the film *Tangerine* shot using three iPhone 5s cameras.

The ability to film and upload video using a phone has already dramatically impacted the industry by allowing anyone to create their own independent projects without a lot of overhead or technical knowledge. Now, advancements and equipment specifically for phone-based filmmaking may democratize film even further by allowing phone users to get the same, high-production-value feel associated with expensive camera equipment.

## Cameras



### Then

With **film cameras**, conducting multiple takes of a scene was costly, as large amounts of film had to be used.

**Film cameras** needed to be reloaded frequently. Film is very delicate, so even the smallest scratch could ruin an entire scene.

Actors used to get feedback from their directors with **no visual aid** to see what they were doing and how they could improve.



### Now

Multiple **digital cameras** can run on the same shoot, getting various angles of a scene at once. Capturing multiple takes is always possible.

**Digital single-lens reflex cameras (DSLR)** have taken over. They allow movies to be filmed in high-definition, which results in an incredible picture display.

With **digital-back cameras**, actors are able to gather around the camera and watch the scene that was just filmed, noting what they can improve on.

## Cameras equipped with 4k+3D Technology

4K technology coupled up with 3D effects is technology that involves virtual reality technology and use of latest camera like the Lucid VR camera capable to shoot 3D videos with 4k resolution. This is the kind of technology that allows filmmakers to shoot scenes underwater and achieve maximum depth to deliver an immersive experience to the viewers.

Image 2: VR Camera capable of shooting 3D videos in 4K resolution



## Dual Camera Virtual Reality (VR)




Image 3: Dual Camera VR goggles



create a finished product that utilizes full 360° recording to allow viewers to watch films the same way they would see in the natural world.

### Powerful Animation and Digitisation

## Animation

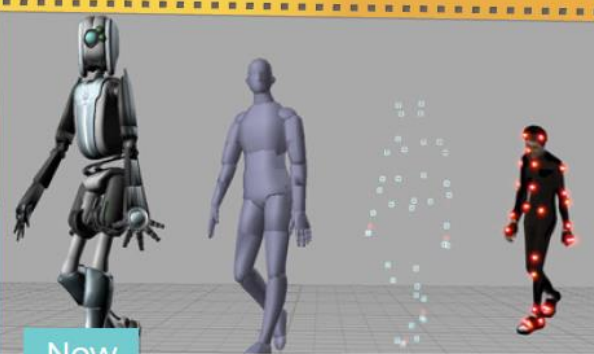


**Then**

Characters were drawn on **cells** and superimposed on common background images to reduce the number of frames and production times.

**Hand-drawn** by artists, who relied on non-stop animation to create the realistic effects.

Computer-generated animation was used alongside the hand-drawn animation to digitally ink and color all animated cels, getting rid of the need to do it by hand.



**Now**

Almost everything animated is **created digitally** through computers, digital pens, tablets, and digital sculpting tools.

Thanks to faster computers and the internet, things that were only possible for major studios 20 years ago can be done by one person, or by a small crew of people.

Studios put actors in mocap suits and record their motion in a way that fits with the character they're animating, then save the motion as a skeleton animation that can be attached to a model later.

The animation in present-day movies is generated using computer-aided graphics and animation technology created with the graphic artist and that can be incorporated into production sequences. The following list are some of the tools animators use:

1. **3ds Max (Autodesk)**. This commercial animation software tool allows digital artists to produce 3D animations, including developing models and rendering them into 2D or 3D images.

2. After Effects (Adobe). Digital artists can use this commercial tool to add visual effects and motion graphics elements to film, TV, video, online content and presentations.
3. Animate (Adobe). Users can create animations across multiple media, from cartoons and banner ads to interactive content for games, TV shows, academic content, and infographics.
4. Blender (The Blender Foundation). This free open-source 3D graphics creation suite offers a comprehensive feature set to create animations, digital art, visual effects, 2D and 3D models.
5. Cartoon Animator 4 (Reallusion). Digital artists across TV, film, web, and game development using this versatile animation tool can create 2D animation with 3D motion.
6. Character Animator (Adobe). Digital artists can use their own movements and expressions to create animated characters in real time.
7. Dragonframe (DZED Systems). The advanced image capture interface of this tool is used for stop motion animation, motion design, and visual effects.
8. FlipBook (DigiCel). This animation software offers digital artists intuitive tools to create 2D animations.
9. Maya (Autodesk). This commercial software provides digital artists with a comprehensive platform and an extensive feature set, including modelling, simulation, and rendering, to create 3D computer animations.
10. Moho Pro 13 (Smith Micro). Formerly known as Anime Studio, this vector-based 2D animation software gives digital artists various tools to create animations and cartoons, including 2D and 3D characters.
11. Moovly (Moovly). This is cloud-based software to create animated videos and videos with animated graphics for various applications, including marketing and training.
12. OpenToonz (Digital Video SpA). This software tool allows digital artists to create 2D animations. As open-source software, it's free to use, anyone can modify its source code, and it's frequently updated.
13. Pencil2D. For digital designers interested in using traditional drawing techniques, this open-source software allows users to create 2D cartoons using both bitmap and vector graphics.
14. PhotoMirage (Corel). It is an animation tool that enables users to combine still images with motion graphics.
15. Piskel. This free online editor allows digital artists to create animations reminiscent of the pixel art in video games created in the 1980s.
16. Powtoon (Powtoon). This cloud-based animation software for digital artists in business, education, and other sectors allows users to create animated explainer videos, demos, and presentations.
17. Spine (Esoteric Software). This software offers users the tools to create 2D animation for games, as well as 3D effects.

18. Stop Motion Studio (Cateater). This software provides an intuitive interface. Its features include frame-by-frame editing to allow digital artists to create stop motion movies using a desktop or phone app.
19. Synfig Studio. Open-source software that provides users with a host of features to create 2D vector-based animations.
20. Harmony 20 (Toon Boom). This 2D software tool includes end-to-end features to enable digital artists to create animations, from conception to final production.
21. TVPaint Animation (TVPaint Development). This 2D software, based on bitmap technology, allows artists to create animations using traditional and digital methods.

### **Digital terrestrial broadcasting (DTT)**

The digitization of broadcasting, particularly the switch to digital terrestrial television (DTT), promises significant opportunities to boost the development of the audio-visual sector. Digital terrestrial broadcasting allows for more efficient use of frequencies, making it possible to broadcast many more channels. This is expected to fuel demand for the type of content that viewers want to watch, underlining the need for data on how viewers consume content. DTT also creates data-gathering opportunities. For example, it can be used to monitor and assess audience viewing rates and preferences. It also offers an opportunity for TV licensing authorities to require TV broadcasters to meet quotas for locally produced content, thereby satisfying local viewers and strengthening local content production.

### **Digital recreation**

Creative editing and the careful application of technology to digitally re-create faces, bodies, and even dialogue is experiencing some dramatic improvements. Digital effects have progressed to where it is possible to create lifelike facsimiles. While this ability represents a tremendous technological advancement for film and stage performances, it does raise several moral and ethical dilemmas. For example, extras are concerned that the ability to digitally create people will cause them to lose work to cheaper digital puppets. In addition, people may no longer be able to rely on the truth of video evidence. Other affected jobs include costume and makeup departments that may become smaller resulting in job losses and eventual redundancy over time. In addition, people may no longer be able to rely on the truth of video evidence. To mitigate some of these negative impacts, there is need for reskilling and upskilling of personnel to reduce redundancy for example reskilling makeup artists and costume designers in online editing and design skills,

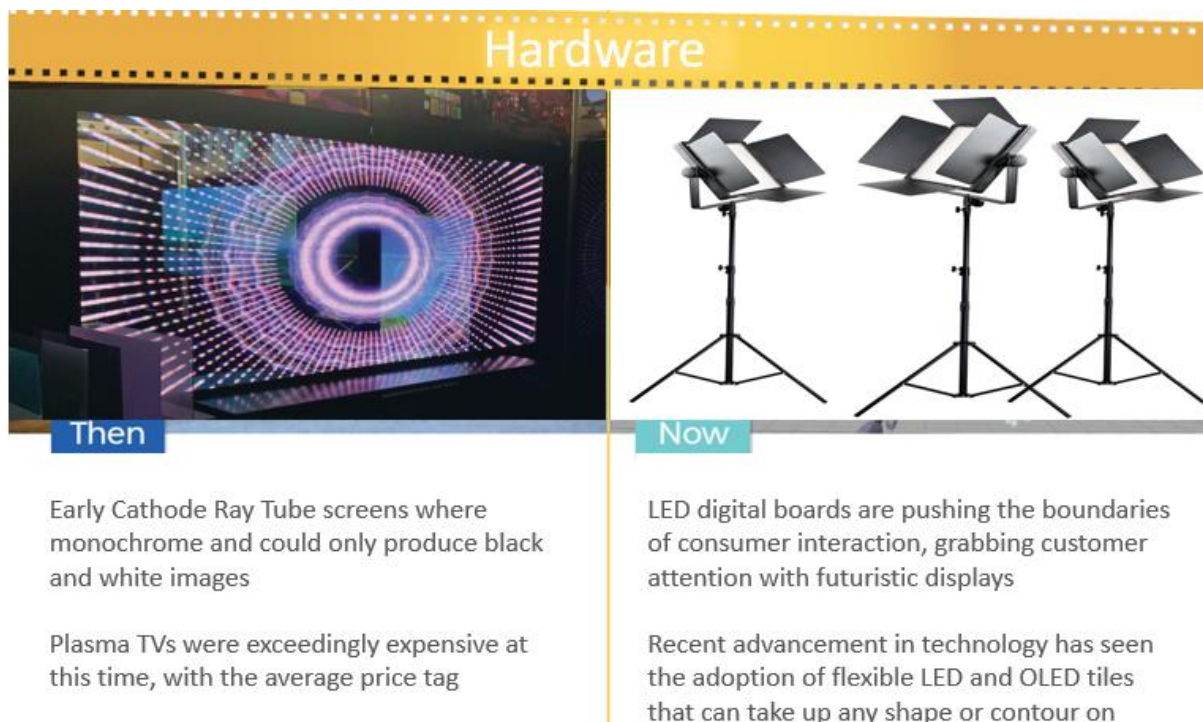
### **Digital Events**

In recent years, especially in light of the COVID-19 pandemic, event promoters have been forced to adopt a remote-first approach to conferences and similar events. Major advances

in audio-visual technology create the resources to deliver a similar experience that one might receive at a live event.

### Virtual production studios

With the COVID-19 restrictions on in-person interaction and the migration to the virtual space, Virtual Production Studios are an innovation in the audio-visual sector. The virtual studios use LED displays and connected cameras to create virtual settings in real time. This has the added benefit of saving time and reducing image compositing and on-location production costs while helping filmmakers to see the camera on the live-action set in any direction.



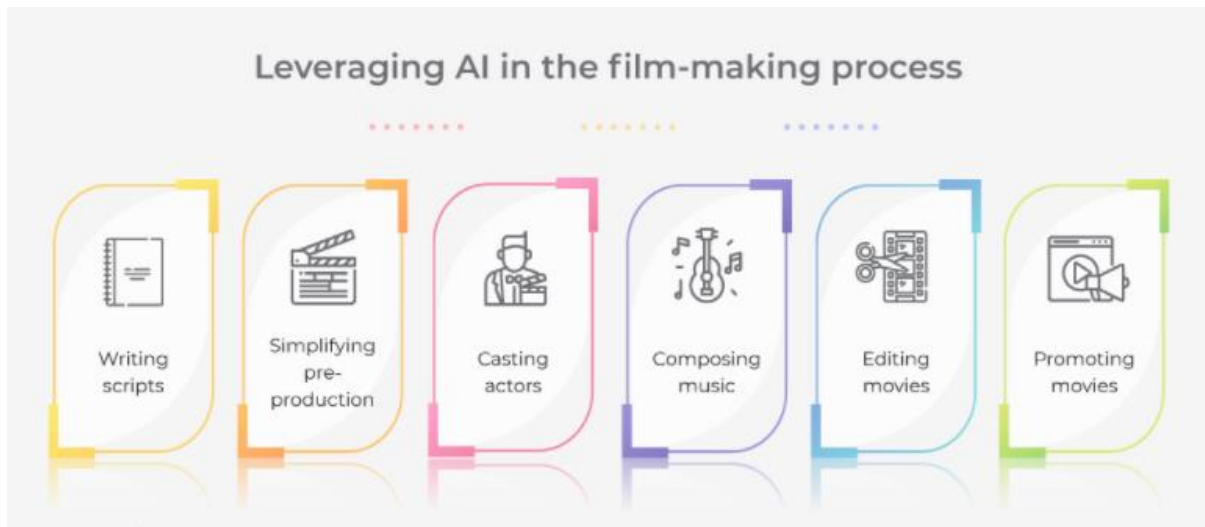
### LED Displays

LED visual displays and Digital Displays popularity has increased (including billboards) due to advancements in the LED and OLED technologies and the continuous innovation in flexible materials. Recent advancement in technology has seen the adoption of flexible LED and OLED tiles that can take up any shape or contour on walls.

### 3D Printing for Props and Sets

Set designers and moviemakers can turn their digital drawings and illustrations into custom built 3D objects. 3D printed objects can be very useful to replicate the imagination of the scriptwriter and the set designers.





### AI-Powered Sound Engineering and Design

AI is helping the sound designers to create more realistic sound effects to the silent movie footage. AI robots are being utilised to detect the realistic sounds that can be assigned to the visual effects of choice. By learning from the videos that are fed to the computers, AI-powered sound engineering software now can detect associated sound effects with the visuals and accordingly can apply them more accurately.

### Intelligent Screenplay Writing through Artificial Intelligence (AI)

Recently, some researchers from New York University built an AI software called Benjamin which is capable of writing screenplays. The AI-powered thinking robot could even write a song after the researchers trained it with more than 30,000 other songs.

### Algorithm editing

Algorithmic editing technologies, such as the software MIT researchers are developing, may in future replace human film and video editing jobs all together. Facial recognition technology has already improved in just the past few years, but computers may soon be able to follow scripts, automatically label every clip, and apply jump cuts and other editing techniques to enhance the feel of a scene.

### Analytics

This involves the use of analytics (big data) in content production such as script analytics, talent analytics, audience analytics and data on production, distribution, and consumption. This has important managerial implications within the AV sector as it can assist in streamlining planning and management of projects within the sector. Some practical examples include:

Script Analysis tools	<p>Page 2 Stage: a free, open-source screenwriting program that contains standard screenwriting features like autoformatting and script analysis.</p> <p>Highland 2: a free screenwriting software available only for Mac users. It has a gender analysis feature which allows users to look at a breakdown of male and female characters in the script and analyze how to better utilize characters across different genders.</p> <p>Kit Scenarist: an open-source writing program available for Mac, PC, and Linux operating systems. Some other useful features include screenplay reports and a research module where you can store all basic information about the script.</p> <p>Others include, Final Draft, Scrivener, Fade In, Causality, Trelby, StudioBinder and WriterDuet</p>
Audience Analysis Tools	Google Analytics, Microsoft SEO Toolkit, Google Insights, ShareThis and SocialBro
Data on production and distribution analysis	Power BI, Sisense, Tableau, Google Data Studio

### Cloud computing

Allows centralisation of data, information and processes resulting in better decision making, improved movie experience and integrated operations. Having access to files remotely makes processes easy and saves time. Cloud computing technology also offers refined solutions to issues such as security issues within the audio-visual industry through the use of private clouds.

#### 4.2.2. Principal aspects of the audio-visual value chain transformed by technology

The AV sector value chain involves several processes, procedures, and skills. Moreover, it also involves huge cost and several concerns including intellectual property rights. The following sub section explains the impact of technology on these key aspects.

### Cost

### Cost



**Then**

The high cost to record on film, rather than digitally, prohibited the growth of independent filmmakers.

**The introduction of special effects** increased the budget of film production.

In the 1990s, movies were becoming exorbitantly expensive to make due to higher costs for **movie stars, agency fees, rising production costs, and advertising campaigns.**



**Now**

**Digital cameras** are less expensive than purchasing and developing film, leading to a rise in independent filmmakers.

**Advanced cameras** can now be used by just one person, cutting down on the number of crewmembers needed on a shoot.

**Crowdfunding** sites allow audiences to donate to projects or campaigns that interest them.

Digital alternatives to shoot, store and preserve content has greatly reduced costs. Digitally equipped cameras cut down production time while the digital format further brings down the cost by easier storage, preservation, and distribution.

## Editing

### Editing/Post-Production



**Then**

The initial editing of all films was done by **physically cutting and pasting** together pieces of film, using a splicer and threading the film on a machine with a viewer.





**Now**

**The cloud** has allowed filmmakers to work with production teams from different parts of the world. Files can now be shared and managed between multiple project groups making collaboration easier.

**Advanced film-editing software** makes it possible to create the effects of an imaginary world and fuse it seamlessly to the footages that are shot using a digital camera.

In the post-production stage, with a digital medium, editors can rectify an unlimited number of errors. Moreover, the digital medium easily allows adding special effects and other audio-visual treatments to the uncut raw material that has been shot.

## Shooting



Digital cameras have an impressive scope to incorporate various effects and experiments. Digital cameras also offer a variety of controls to shoot the visuals as per preferred contrast, colour scheme, saturation, light scheme, etc. Moreover, the digital camera allows real-time viewing. A variety of lenses can also be used as per visual needs as well.

## Distribution

Promotion/Distribution



**Then**

Prior to the widespread use of the internet, film studios could only promote their upcoming film productions via **posters, magazine ads, newspaper articles, billboards**, etc.

Twenty years ago, marketing a brand-new sci-fi film could take significant market research to determine where and when to market it.





**Now**

**Self-distribution platforms** create marketing campaigns which can deliver content globally, all online.

Current **promotional material** for the film industry is curated on singular websites dedicated to nothing but advertisement. The content is more feature-rich, offering site visitors a better user experience and more active engagement.

**Social media** groups, categories, and hashtags allow filmmakers to specifically target a particular demographic with similar interests.

The emergence of multiplexes that use the internet to connect various parts of the globe added a huge opportunity to the traditional distribution. A new breed of online distribution channels like Netflix and YouTube have made it easier to get viewers beyond the traditional distribution processes.

## Preservation

Digital films stored in computer servers cost almost nothing compared to what preservation of the physical storage of films used to cost.

### Consumption



**Then**

"Nickelodeons", or 5-cent movie theaters, began to offer an easy and inexpensive way for the public to watch movies, increasing the appeal of film and generating more money for filmmakers.

The 1970s saw the advent of films on VHS video players and laser disc players, greatly increasing profits and revenue for studios, but caused a decrease in theater attendance.



**Now**

By 2018, revenue from electronic home video (which includes streaming services and on-demand programming) is projected to **surpass that of U.S. cinema**.

While watching films, **second-screen apps** allow viewers to get inside information and behind-the-scenes looks on their phone.

In-theatre experiences have been enhanced with advanced speakers that make the audience feel like they are in the movie.

### 4.3. Case Studies

The study takes place within the context of the national and, to a certain extent, the international environment. The focus of this section is to benchmark case studies to the KZN AV sector in terms of the application of technology.

The review of case studies enables for a better analysis of the level of success in the application of technology across other regions. The process of case study analysis also enables learning from regions which might not have been able to successfully apply technology. This plays a critical role when it comes to the recommendations that may be applied in the KZN case.

#### 4.3.1. Global

Prior to 2020, the global film industry showed healthy projections for the future, with worldwide box office revenue having grown consistently for years and amounting to more than 42 billion U.S. dollars in 2019. However, the Covid19 pandemic began to severely impact the film industry in early 2020 after countless movie theatres closed in an effort to contain the outbreak. As a result, film industry revenue for 2020 dropped significantly from previous years globally. (Watson, 2020).

#### United States

The United States, as an early innovator in the AV sector and through its related development of Hollywood, is a major contributor to the global film sector. The sector has boomed over the past decade and continues to dominate the global market.

Hollywood has also been negatively impacted by several external factors including the Covid-19 pandemic. Additional challenges include the rise of TV, the internet and digital piracy. Filmmakers found ways to adapt and have additional tools to assist the industry growth such as understanding customers, innovation and by restructuring.

For example, studios that were once highly integrated owning cinemas and employing large permanent staff now they have relatively few assets and outsource assignments to flexible talented teams. While technology is filling in the gaps on socially distant shoots.

According to the whitepaper, Hollywood's Vision for the Future of Production in 2030, the future of media creation will be driven by technology with cloud integration, enhanced security, data-driven interfaces and real-time workflows to form the new foundation of media creation and partnerships.

### **Cloud Based solutions**

One of the most innovative adaptations being employed by Hollywood is using web-based tools for teams work on films and television remotely. A new service: Camera to Cloud, which allows multiple people to start working on a shot the second the director films it, is greatly reducing the number of people on set and increasing the number who can contribute from a safe, socially distant place. Camera to Cloud uses transcoding boxes and audio decks to send each shot to everyone working on a project as soon as the shot is captured.

A new livestream feature, that allows someone off set to look through the main camera's lens and weigh in on lighting, props, shot framing, is also expected to roll out in the near future.

### **Virtual production capabilities**

Hollywood is also relying on Covid-conscious cinematic innovations developed in the last year. There are technologies like Solo Cinebot, a robotic camera that can film actors remotely, and Crew in a Box, which is essentially a briefcase with a Blackmagic Pocket Cinema Camera 6K, a three-panel LED light, a teleprompter, a mic, and an ATEM Mini Pro, which allows the director to control everything (and direct the talent) remotely. That has enabled networks like NBC, ABC, and MTV, to get super-high-quality footage while exercising social distancing.

A lot of this tech was in development before this pandemic hit, but the rather dire circumstances brought on by Covid-19 have either fast-tracked them or inspired new features and spurred adoption.

### **India**

There is evidence that India is beginning to offer serious competition for Hollywood. The Indian film sector (known as Bollywood) has developed substantially over the last century, particularly in aspects such as goods and services, capital, human resources, and technology.

### Digital releases

Like in Hollywood, the pandemic also led to a re-assessment on the technical and creative fronts in India. Film producers have begun creating more digital content. Over the last two or three years, Bollywood used to be around 90% theatrical releases, which has now come down to 60-65% while 30-35% content is for OTT and television (Chakraborty, 2020).

Unlike other productions, animation projects have been ongoing since last March in India with employees given hardware, software, and proper bandwidth to work from home. 2020 also saw digital platforms ramping up their acquisitions of film titles, with Amazon Prime Video India picking up a number of films.

Cloud computing and the use of CGI has also been incorporated more into the Bollywood AV industry.

### 4.3.2. Regional

A study by the World Intellectual Property Organisation (WIPO, 2018) highlights a fundamental data gap within the audio-visual sectors of most African countries. Including basic information on the number of films produced annually is unavailable. In some cases, there is no system in place to register or license production shoots, and in others, such systems are not being fully utilized by producers.

Statistics on the number of companies and professionals involved in the industry and revenues earned from content distribution are also rarely available. Several countries also lack data on the way audio-visual works are consumed. These data include audience numbers, viewing figures for cinema and TV and evolving programming tastes and trends. However, this sub section will focus on the largest African AV industry, Nigeria.

### Nigeria

Today, Nigeria eclipses the rest of the African film industry through 'Nollywood' industry. It is the second-largest movie industry in terms of productivity (India's 'Bollywood' being the most prolific). In terms of revenue, Nigeria generates the largest share of box office revenue in anglophone West Africa. The high percentage is directly related to the large population of Nigeria (over 200 million people), compared to other countries.(Varrella, 2021).

However, due to the coronavirus pandemic cinemas were closed. They reopened in Nigeria in September 2020. Thus, admissions as well as revenue considerably dropped in 2020, reaching only 1.7 million admissions, about 67% less compared to 2019. Pre-pandemic, the Nollywood film industry was employing around one million people, making it one of Nigeria's largest employers (Varrella, 2021).

### **Switch to internet-based operations**

In light of the closures of cinemas and most film production, Nigeria's AV industry has shifted to internet-based operations. This is also attributable to the increased internet access in the country. As a result, Nigeria's AV sector revenue is set to rise at 19.3% CAGR to reach US\$10.8 billion in 2023 from US\$4.5 billion in 2018. Although the Internet dominates much of the revenue there is still room for improvement in service. Outside of internet access, TV and video in Nigeria will push towards US\$1 billion in revenue by 2023 after adding US\$172 million over the next five years. (PwC Africa Entertainment and Media Report 2019 – 2023).

### **4.3.3. South Africa**

South Africa has always been recognised for its quality film production crews and diverse, unique locations that have drawn in foreign investment. Its satellite distribution system is probably the best on the continent, giving access to more digital and streaming content.

South Africa's film industry is the oldest in Africa and in the world and is one of the more established and commercially viable on the continent. However, it does not produce as many films as Nigeria (NewAfrican, 2021). Original films, however, are still relatively few although a new generation of innovative young filmmakers are determined to change this.

### **Remote content production**

An emerging trend has been the production of content remotely. Several collaborative productions were initiated almost immediately after the country's lockdown started. For this, actors performed scenes at home, filming themselves on whatever camera or device they had access to. The footage was then uploaded for editors, also working from home, and director viewings are done remotely using platforms like the now ubiquitous Zoom.

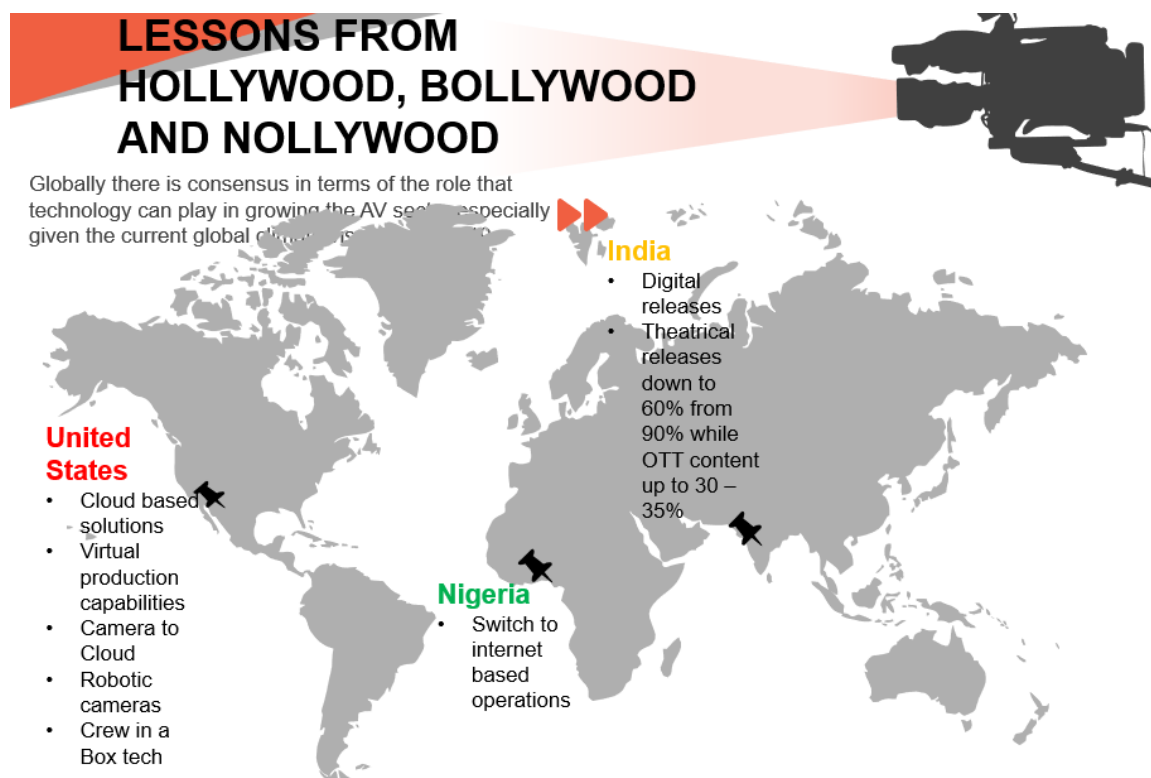
Remote filmmaking makes it possible to keep producing films by optimising on a collective of different creatives' skills, equipment, and software. It also capitalises on creative collaboration – which had already been a feature of local production, especially documentaries – and reduces the notoriously large carbon footprint of filmmaking.

### **Independent distribution models**



According to Digital TV Research, a London-based industry forecaster, streaming subscriptions in Africa are likely to increase from 3.9m, as reported in 2020, to 13m by 2025. Most of South Africa's AV content is available on streaming service Showmax from local satellite entertainment giant MultiChoice. Showmax seems to be prioritising acquiring local content by licensing as many as they can, as quickly as they can. Showmax currently has an estimated share of 861 000 subscribers in 2021 behind Netflix's 2.61 million subscribers (Ferreira, 2021).

Making and distributing films in new ways, that are also cognisant of the global climate emergency, is going to become a growing trend not just in South Africa, but around the world. In South Africa that includes inspiring or enhancing innovative ways of creating and sharing films. For instance, some South African filmmakers have been exploring independent distribution models for a while. Some are now streaming directly from their own websites on a pay-per-view basis, using their own platforms and ticketing service, such as OneTix. (Maarsdop, 2020).



#### 4.4. Synopsis of situation analysis findings

Globally there is consensus in terms of the role that technology can play in growing the AV sector especially given the current global climate vis-à-vis Covid19. Many AV sectors across the world are employing technology to remain viable including applying cloud-based solutions to work around social distancing guidelines. There has also been a marked advent of online streaming and subscription OTT service with more and more consumers choosing to

consume AV products on demand. On the back of increased internet access, there is also a marked rise in internet or web-based AV products that are mass produced on a global scale.





The situational analysis has informed the focal points of the strategy as follows:

- establishing the everchanging environment within which the KZN AV sector operates due to changes globally in technology and other external factors most importantly the COVID19 pandemic
- establishing the importance of the AV sector to the KZN economy including its contribution to GDP, employment and household income
- outlining the prevailing trends and evolution of the sector in KZN
- identifying quick wins for the various subsectors of the KZN AV sector
- identifying the existing and new technology that can be employed in the sector
- benchmarking global, regional and national global best practice through the case studies



## 5. IDENTIFIED AREAS OF TECHNOLOGICAL IMPROVEMENT

Based on the findings of the situation analysis, there are some key identified trends and areas of improvement that are summarised in the following subsections. These ultimately provide the basis for the development of the strategic plan and recommendations of this research.

<b>Strengths</b> 	<b>Weaknesses</b> 
<ul style="list-style-type: none"> <li>▪ Sector is very attractive to the youth in KZN</li> <li>▪ Rapid digitisation and application of new technologies such as drones</li> <li>▪ New forms of artistic and creative expression</li> <li>▪ High levels of internet access in urban areas in KZN</li> <li>▪ Aspects of the KZN film sector are experiencing steady growth e.g., TV productions with 3 KZN based telenovelas among the topmost viewed programmes on TV nationally</li> <li>▪ Television services have largely migrated onto the wired and wireless internet via subscription over-the-top (OTT) services such as Showmax and Netflix</li> <li>▪ The sector stimulates growth, generates substantial employment, brings in valuable foreign exchange and acts as an important means through which technology is transferred and the skills base is upgraded</li> <li>▪ The KZN audio-visual industry encompasses a range of creative production activities</li> <li>▪</li> </ul>	<ul style="list-style-type: none"> <li>▪ There is a lack of sufficient funding programmes and supporting structures in the AV sector</li> <li>▪ Funding institutions need to reassess their criteria to offer support to more digital content producers</li> <li>▪ The sector is very attractive to the youth however many youths do not find it sustainable in the long run due to high operational costs, lack of funding and lack of sufficient skills</li> <li>▪ Workforce is predominantly young, but the majority is underpaid and cannot be economically independent.</li> <li>▪ Low levels of sector specific market intelligence</li> <li>▪ AV technology is expensive to obtain and maintain</li> <li>▪ Main AV sector activities concentrated in Durban</li> <li>▪ Widening skills gap</li> <li>▪ Low apprenticeships and other work-based learning programmes for youth</li> <li>▪ Cinemas are declining in terms of patronage, ticket sales and revenue.</li> <li>▪ DVD sales are declining.</li> <li>▪ Underdeveloped ICT infrastructure in many parts of KZN.</li> <li>▪ The new internet-based platforms are to a large extent "free access" therefore new revenue models need to be created to harness revenue streams from these</li> </ul>
<b>Opportunities</b> 	<b>Threats</b> 
<ul style="list-style-type: none"> <li>▪ Content producers can now distribute content independently and directly to consumers via the internet</li> <li>▪ consumers can now consume AV products anywhere via smart phones, smart homes and connected cars</li> <li>▪ Smart mobile devices are now becoming an ever-increasing distribution network.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Traditional film markets have been negatively affected by the pandemic and the lock-down of the economy that followed</li> <li>▪ Reliance on technology may make humans redundant leading to job losses</li> </ul>

- The potential from this mobile revolution may be seized by the KZN AV sector to create new revenue streams and create growth within the sector
- Virtual reality (VR) continues to attract significant investment from major media and technology companies
- E-sports' popularity in KZN is on the rise
- Digital events and livestreaming have become the new norm
- Subscription Video-on-demand [VOD] streaming platforms (Netflix, Disney+, Showmax Hulu, AppleTV) are growing in popularity and usage
- Internet and social networks are a rapidly expanding market
- Traditional AV sector markets under increasing competition from new internet-based markets
- Local content creators need to improve their technical knowledge and understanding of new technology platforms and develop skills to use them; training in this regard must become a priority
- the sector as it is considered a high-risk low return investment
- There is still an issue of retaining talent in the province, as there are not enough productions to employ young filmmakers.
- A shortage of skilled film crews and supporting infrastructure.
- Local films are poorly distributed.
- Audiences have poor access to local films.
- A relatively small talent pool compared to the other two main film producing provinces, namely Gauteng and the Western Cape, especially with respect to scriptwriters and actors

### 5.1. Trends changing broadcasting and the future of television

- ❖ With the rapid audience shift from television to digital, staying relevant in broadcast media is challenging but necessary for long-term viability.
- ❖ Broadcast television is evolving rapidly and there is a need to transform from serving a TV audience to serving audiences no matter where they are, essentially, going from a TV broadcaster to an overall broadcaster.
- ❖ Television services have largely migrated onto the wired and wireless internet via subscription over-the-top (OTT) services such as Showmax and Netflix.
- ❖ Television screens are no longer the 'primary screen' for viewing filmed content, with tablets and mobile phones being used as 'secondary screens.' This research highlights that viewing on multiple platforms, other than television, is growing to a stage in which all screens will work together seamlessly.
- ❖ Universal screens will demand greater content mobility: the research notes that as the cost of screens declines and digital surfaces appear everywhere (car, homes, retail centres, public spaces, etc.), there will be a growing demand for content to seamlessly follow the viewer wherever they may go.
- ❖ With the growth of VOD services, the three KZN based telenovelas should also be available on VOD services such as Showmax and Netflix.
- ❖ Producers should also ensure that their content is produced in formats that can be viewed on a range of devices including smartphones and tablets.

## 5.2. Trends within the Film/Cinema sector

- ❖ New entrants demanding unique content will drive innovation beyond the traditional film studio system.
- ❖ Making and distributing films in new ways, that are also cognisant of the global climate emergency, is a growing trend. For instance, some South African filmmakers have been exploring independent distribution models for a while. Some are now streaming directly from their own websites on a pay-per-view basis, using their own platforms and ticketing service, such as OneTix.
- ❖ Production that is sustainable and cognisant of climate change is also emerging as important. For example, many production sets now include a Sustainability Production Assistant (PA) or Green Monitor who is dedicated to coordinate, engage and promote sustainability on a film or TV production. Other green initiatives are:
  - ensuring that the lights and appliances used on-set, and at the production office, are as energy efficient as possible.
  - ensuring that all non-essential appliances are switched off when not in use.
  - Fuel efficiency through no-idling on set and making sure the shuttle is full before leaving.
  - Better planning to reduce unnecessary trips, saving fuel, money and time.
  - Eco procurement on sets including using biodegradable products such as biodegradable make up wipes (KZNFC, 2019, Guidelines for sustainability in the Film Industry).
- ❖ An emerging trend has been the production of content remotely. For this co-authored fiction films, actors performed scenes at home, filming themselves on whatever camera or device they had access to. The footage is then uploaded for editors, also working from home, and director viewings are done remotely using platforms like the now ubiquitous Zoom.
- ❖ During the pandemic, consumers have moved dramatically toward online channels to watch films. With the increasingly capable and well-equipped smartphones technology many people are opting to view films on their handheld devices.
- ❖ Filmmakers should create separate versions for smartphones that are fully compatible with mobile screens.
- ❖ The ability to film and upload video using a phone has already dramatically impacted the industry by allowing anyone to create their own independent projects without significant overheads or technical knowledge. Now, advancements and equipment specifically for phone-based filmmaking allows phone users to get the same, high-production-value feel associated with expensive camera equipment.

- ❖ There has been an extreme range of audio visual -based developments related to digital technologies, such as the use of CGI and digital editing
- ❖ Since traditional cinema exhibition is not viable for the majority of SA content, and exhibitor costs are prohibitively high for many filmmakers, alternatives must be identified and exploited. Some options include:
  - Community based screening facilities
  - Video in demand streaming services
  - Internet based solutions
  - Virtual productions

### **5.3. Trends in Internet/web-based products and services**

- ❖ The internet has been largely responsible for changes to the AV industry.
- ❖ It has revolutionised both marketing and distribution channels used for this industry.
- ❖ With the wide accessibility of the internet through modern technologies, production studios and providers now use it as the main way to market their products to audiences, such as posting trailers online to platforms such as YouTube. This allows for cheaper and quicker distribution of material whilst reaching larger potential audiences.
- ❖ The internet also allows for these studios to create websites where audiences can access information and online extras for audiences.

### **5.4. Trends and evolution of the multimedia sub sector**

- ❖ Virtual reality (VR) remains a niche category, but the sector continues to attract significant investment from major media and technology companies that are eager to seize a share of this fast-growing market.
- ❖ Other niche markets popularised by the new norm include the E-sports' market, digital eventing and live streaming.
- ❖ Digital music-streaming providers continue to gain traction among consumers with streaming revenue set to increase.
- ❖ Teleconferencing and cloud-based collaboration media has also seen an exponential rise globally.

## 6. STRATEGIC PLAN

As has been demonstrated in the situation analysis section, the KZN AV industry, like many other industries, has been impacted by a number of external factors. In particular, the COVID19 pandemic brought significant challenges. The restrictions on both internal and international travel and movement combined with worsening economic conditions and job losses has, and will continue to have, a negative impact on traditional AV markets including Film and Cinema.

As an important emerging economic sector of the KZN economy, the AV sector will need to embark on a recovery plan to deal with the new and ongoing challenges and possible opportunities as a result of the pandemic. The AV sector will also need to leverage its existing resilience and rely on innovation and technology to stabilise and grow the sector.

The fluidity of technology in the AV sector has increased format options for content creators in the marketing promotion and exhibition of local content. Rapid digitisation and ever-changing technological advancements including the fourth industrial revolution is already presenting many challenges and opportunities for industries globally. As industries are reshaped and disrupted, it has become imperative that appropriate strategies are developed to adapt to the changing environments.

Having established the ever-changing context the KZN AV sector operates in, it is critical that a bold strategic plan for harnessing technology within the sector be established to guide the KZNFC along with all the relevant stakeholders in collectively building a thriving and robust AV sector in the region. The adoption of this strategic plan that leverages on the opportunities presented by technology will enable the industry to access greater support to drive its rapid recovery and regain its important contribution to the KZN economy.

### 6.1. Purpose

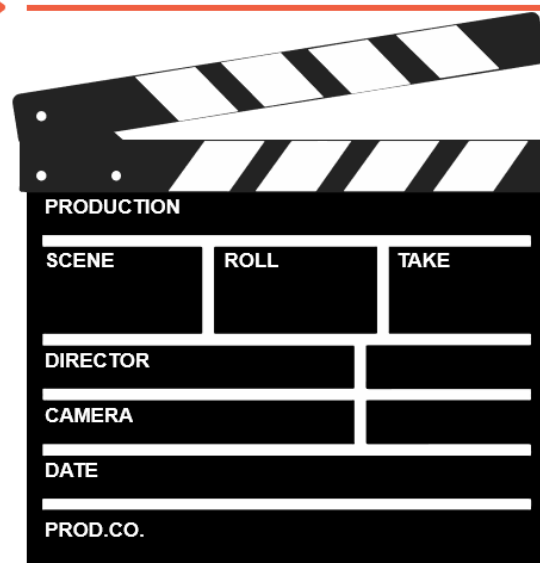
The purpose of this strategic plan is to guide the KZNFC and the KZN AV sector stakeholders to work towards common goals that will build a technologically competitive, innovative, and thriving, AV industry. It aims to harness the enormous potential and opportunities presented by technology within this industry to grow the sector, improve productive efficiency and jobs and support the local economy.

The main objective is to transform the local industry and ensure the industry is competitive on all fronts technologically including the development of the right skill sets to build an industry that can adapt to technological changes. This is in line with the KZNFC mandate to make the province a film production centre.

This strategic plan therefore seeks to achieve the following main objectives:

## Strategic Objectives ▶▶

- 1** | Identify areas of technological improvement that the industry can adopt
- 2** | Assess the key considerations in leveraging on technology and determine the competitive outcomes
- 3** | Identify and measure the technological requirement needs of the KZN AV sector
- 4** | Quantify the investment that will lead to the growth of the KZN AV sector
- 5** | Develop a concise action plan for KZNFC and the industry to harness technology within the sector
- 6** | Create an enabling environment for growth and development of the sector through technology



The formulation of this strategic plan is therefore approached in a way that sets out to:

1. Take immediate action to address the technological needs in the KZN AV sector to:
  - Promote growth and development of the sector
  - Create new jobs and livelihoods
  - Create productive assets, businesses, and participants from which newly diversified, competitive, and dynamic AV sector will emerge in the short to medium term.
2. Set a bold ambition for the future, aiming to deliver significant turnaround in the sector.
3. Develop pragmatic and practical plans, with measurable outcomes.

The strategic plan has, in addition, been designed against the following key approaches:

1. A phased approach to ensure that immediate action is taken, while at the same time accelerating the work required to advance planning and implementation towards the long-term vision. The intent is for the Strategic plan to be flexible and enable agility and responsiveness.
2. A bias for action and plans that are practical through projects to be implemented in the short to medium term.

## 6.2. Vision and Goals

KZNFC's vision is to be “**A globally competitive, transformed and sustainable film industry in KwaZulu-Natal**” which will be achieved through being a catalyst for transformation, job creation and sustainability through funding, human capital development and the promotion of KwaZulu-Natal.

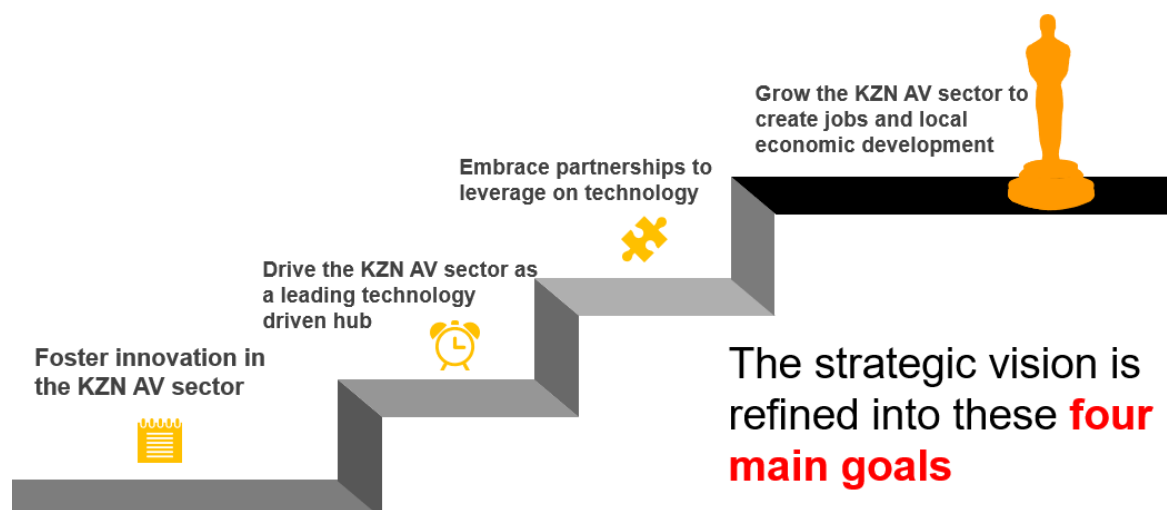
The vision of this strategic plan mirrors the essence of the KZNFC's ultimate vision.



The vision provides a point reference for stakeholders to keep stakeholders focussed and geared towards the right direction. It provides an opportunity for all stakeholders to think in broad terms about the future of technology within the KZN AV sector and sets a clear course within which the entire strategic plan is framed.

The vision is refined into four main goals. These are:

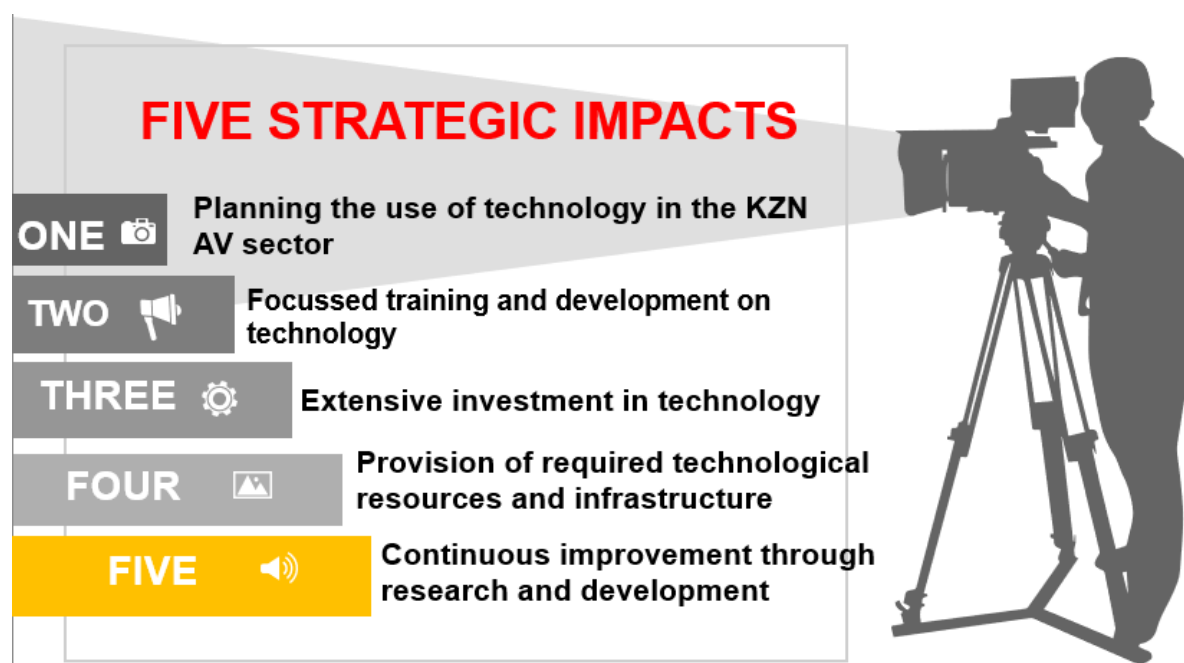




The strategic impacts and outcomes and action plan to be adopted by the KZNFC and stakeholders are aligned to the scope of the vision and goals of the strategic plan.

### 6.3. Strategic Impacts and Outcomes

The strategic impacts and outcomes represent the foremost strategies and drivers to guide the adoption of technological advancements in the KZN AV sector. This plan identifies five strategic impacts through which the KZN AV sector can leverage on technology to grow the sector namely:



The following is an unpacking of the strategic impacts and outcomes.

### 6.3.1. Planning the use of technology in the sector

#### Impact

**Impact** A fully conceptualised and planned leveraging of technology in the KZN AV sector

#### Explanation

As the AV sector landscape embraces new technologies it will become more accessible to a broader range of producers and consumers. However, it will also become more competitive and dynamic as participants realise the opportunities that technology can bring into the sector.

It is therefore important to develop new and appropriate plans and strategies that will work to secure the planned use of technology in current and future markets. Each segment of the AV sector needs to have robust plans in place to effectively leverage on technology and be best placed to respond to any changes in technology or other external factors.

The following table outlines the interventions for Planning the use of technology in the KZN AV sector.

#### Interventions and Outcomes

Table 4: Interventions for Conceptualisation and Planning the use of technology in the KZN AV sector.

Interventions	Outcomes	Implementation
1. Work with industry to assess current levels of technology use and identify short- medium- and long-term technology needs per market segment	Necessary metrics to understand how technological the industry is so that advancement can be driven in the right areas of the industry	Year 1 - 2
2. Work with industry to set technology goals and timelines	A clear plan and roadmap to drive and measure changes across the industry.	Year 1 - 2
3. Work with industry to develop a focussed marketing and budget plan for technology	Creation of a plan that stakeholders can recognise and adhere to	Year 2 - 3
4. Development of an AV sector Technology and Innovation Strategy	Attainable goals to achieve the longer-term vision and facilitate provision of funding.	Year 3

#### Measuring Outcomes

Interventions	Outcomes	Outcome Indicator
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Work with industry to assess current levels of technology use and identify short-medium- and long-term technology needs per market segment	Necessary metrics to understand how technological the industry is so that advancement can be driven in the right areas of the industry	Database of metrics updated regularly
Work with industry to set technology goals and timelines	A clear plan and roadmap to drive and measure changes across the industry.	Widespread stakeholder buy in
Work with industry to develop a focussed marketing and budget plan for technology	Creation of a plan that stakeholders can recognise and adhere to	Widespread stakeholder buy in
Development of an AV sector Technology and Innovation Strategy	Attainable goals to achieve the longer-term vision and facilitate provision of funding.	Increased funding and partnerships

#### Key Risks and Mitigation

Interventions	Key risks	Risk Mitigation
Work with industry to assess current levels of technology use and identify short-medium- and long-term technology needs per market segment	Low input from industry	Conduct continuous engagement industry development workshops sessions to encourage participation
Work with industry to set technology goals and timelines	Low input from industry	Conduct continuous engagement industry development workshops sessions to encourage participation
Work with industry to develop a focussed marketing and budget plan for technology	Non- compliance with the plan	Periodic review of internal control for continuous improvements (
Development of an AV sector Technology and Innovation Strategy	Inadequate implementation of research recommendations by the entity.	Develop systems to monitor and track that recommendations are implemented

### 6.3.2. Focussed training and development on technology

#### Impact

**Impact**      **Growth of the audio-visual industry through training, upskilling of industry participants in line with changes in technology**

#### Explanation

KZN has a reputation for producing high quality film and media personnel, from film crews to technicians, actors and film support staff and services. However, the rapid pace of digitisation

and technological advancement globally, which often outpaces the rate of skills development, has led to a widening skills gap. Due to this ongoing digital disruptive innovation within the industry, there is a need to ensure that the right blend of future-orientated technology centred skill sets are brought into the industry.

In addition, there is a disconnect between current educational providers and the industry, with practical skills development needed at different employment levels. To grow and transform the industry, there is need to ensure that there are enough appropriately skilled resources entering the market. It is crucial that the sector remains relevant and reflects changes in the industry due to technological advances or economic developments. It is therefore necessary to assess the skills gaps in the industry to determine where and in what investment is needed.

The aim therefore is to ensure the growth of the audio-visual content industry through training, upskilling of industry participants in line with changes in technology.

The KZNFC should take the lead in engaging with educational institutions that specialise in audio visual training to ensure that curricula are in keeping with technology trends and that the right training is given. Established production companies could also partner with training facilities to identify skills gaps and ensure that sufficient practice is gained before graduation. KZNFC training programmes are currently addressing some of the skills however there is still room for additional initiatives that are focussed on technology in particular.

### Interventions and Outcomes

Table 5: Interventions for training and development on technology

Interventions	Outcomes	Implementation
1. Conduct an industry skills baseline assessment to identify the skills gaps regarding technology in the industry	Detailed skills gap analysis	Year 1 - 2
2. Work with industry to develop tech focused masterclass sessions for upskilling	Transfer of skills, growth in depth and resilience of skills in the industry	Year 2 - 3
3. Establishment of partnerships with industry, training, and educational institutions to create a feeder system for incoming skills	Bridge the gap between training and educational institutions and industry	Year 2 - 3
4. Leverage on existing FITI programme to develop technology training and innovation skills programme	Focus existing resources on technology	Year 1 - 3
5. Drive apprenticeship programmes for new entrants	Transfer of practical skills in the industry	Year 1 - 3

## Measuring Outcomes

Interventions	Outcomes	Outcome Indicator
Conduct an industry skills baseline assessment to identify the skills gaps regarding technology in the industry	Detailed skills gap analysis	Film schools/educational institutions and programmes curricula changed in line with findings
Work with industry to develop tech focused masterclass sessions for upskilling	Transfer of skills, growth in depth and resilience of skills in the industry	Number of masterclass sessions
Establishment of partnerships with industry, training, and educational institutions to create a feeder system for incoming skills	Bridge the gap between training and educational institutions and industry	Number of established partnerships and compacts
Leverage on existing FITI programme to develop technology training and innovation skills programme	Focus existing resources on technology	Enrolment in technology training and innovation skills programme
Drive apprenticeship programmes for new entrants	Transfer of practical skills in the industry	Number of apprenticeship programmes

## Key Risks and Mitigation

Interventions	Key risks	Risk Mitigation
Conduct an industry skills baseline assessment to identify the skills gaps regarding technology in the industry	Unsuitable service providers to conduct study	Conduct continuous supplier development programmes
Work with industry to develop tech focused masterclass sessions for upskilling	Low interest/participation from industry and youth/pupils (targeted groups)	Develop outreach programmes to encourage participation
Establishment of partnerships with industry, training, and educational institutions to create a feeder system for incoming skills	Low interest/participation from industry and youth/pupils (targeted groups)	Conduct continuous engagement industry development workshops sessions to encourage participation
Leverage on existing FITI programme to develop technology training and innovation skills programme	Poor coordination of resources	Seek partnerships to leverage on FITI programme
Drive apprenticeship programmes for new entrants	Low interest/participation from industry and youth/pupils (targeted groups)	Conduct continuous engagement industry development workshops sessions to encourage participation

### 6.3.3. Extensive investment in technology

#### Impact

**Impact** Financial support and investment facilitation into technology which is seen as critical to the long-term success of the industry

#### Explanation

As has been established, technology is an important tool in the KZN AV sector which can be used to stimulate growth and provide new opportunities in the sector. It is therefore an imperative part of this strategic plan to aggressively invest in technology in the sector.

KZNFC should take the lead in investing in technology equipment, infrastructure, tools, production technologies and technology applications across all the market segments. Investment in technology is vital particularly equipment that filmmakers need; highly advanced equipment used on sets in real time, block chain technology in post-production and enhanced accessibility in the various digital distribution platforms.

KZNFC should also create investment opportunities that will attract investors into the sector to expand technology infrastructure and sustain the industry growth into the future. Investment in technology, if harnessed correctly, has the potential to generate massive returns in terms of regional job creation, enterprise development and economic growth.

The drive therefore is support through financial support, investment facilitation and promotion for the local industry and unlocking investment opportunities for entrepreneurship development including initiatives that range from enabling the start-up of small businesses to providing business skills development. It is also important that, under this strategic impact, the KZNFC also encourages private sector and foreign investment which is seen as critical to the long-term success of the industry.

#### Interventions and Outcomes

Table 6: Interventions for extensive investment in technology

Interventions	Outcomes	Implementation
1. Identify potential investors and develop a database of investors	Create a growing list of investors applicable within the film industry	Year 1 - 2
2. Ring fence funds in the annual budget allocated to technology development	Pooling of funds that remain available for use in technology infrastructure provision	Year 2 - 3



## Measuring Outcomes

Interventions	Outcomes	Outcome Indicator
Identify potential investors and develop a database of investors	Create a growing list of investors applicable within the film industry	Number of investors
Ring fence funds in the annual budget allocated to technology development	Pooling of funds that remain available for use in technology infrastructure provision	Level of funds available

## Key Risks and Mitigation

Interventions	Key risks	Risk Mitigation
Identify potential investors and develop a database of investors	Low uptake from potential investors	Communicate KZN offering at national, African and international platforms to attract investors
Ring fence funds in the annual budget allocated to technology development	Lack of funding for the fund. Funds consistently being reduced on an annual basis due to budget cuts	Partnerships with other like-minded funders established to share the costs

**6.3.4. Provision of required technological resources and infrastructure**

## Impact

**Impact** Provision of necessary resources particularly access to required funding to acquire technological solutions

## Explanation

Operational certainty as it relates to funding is extremely important for the continued growth and development of the audio-visual industry. Provision of necessary resources particularly assisting local industry players to access required funding to acquire technological solutions is critical. Currently the funding of AV sector is inextricably linked to existing institutional structures. Main sources of funding include the KZNFC, NFVF, DTI, international film funds and organisations with small portion of private funds.

The AV industry has seen dynamic shifts in traditional roles, as different forms of content fuse to create new content products which are more interactive and offer multiple forms of revenue. Due to the changing landscape of the audio-visual sector, it is clear that funding institutions need to revisit their structures and policies in order to provide the best solutions to filmmakers and ensure the industry remains an economically viable sector.

Key elements of this strategic impact are:

- ❑ A seed fund needs to be set aside to provide funding to the local industry
- ❑ Ensuring that adequate funding models are in place to grow and sustain the industry.
- ❑ Assist local filmmakers to access streams of funding e.g., crowdfunding/ private funds
- ❑ Reassess funding criteria on existing streams of funds to support digital content
- ❑ Increase revenue from new digital streams which can be recouped back into traditional AV sector activities

The key mechanism through which this strategic impact will be achieved is through an established " Technology Innovation Fund " that makes resources available for the industry's technological needs as determined applications received from filmmakers in KZN. To access the fund, applicants need to fulfil a set of prescribed criteria which may include for example:

1. Geographic: limited to KZN
2. BEE criteria: at 25.5% black African
3. Commercial viability: projects should be supported by clear market viability<sup>3</sup>

The fund may be further leveraged by the other government and private sector programmes and funding stream as and where necessary. Alternative funding sources may also be considered and assessed as part of the funding model. External partnerships and social compacting may be integrated through linked bespoke financing partnerships to enable the various projects and programmes

### Interventions and Outcomes

Table 7: Interventions for provision of resources

Interventions	Outcomes	Implementation
1. Establish a Technology Innovation Fund	A funding model and stream that assists local filmmakers	Year 1 - 2
2. Reassess funding criteria on existing streams of funds to support digital content	A dynamic funding model that can adapt to tech needs	Year 1 - 2
3. Increase revenue from new digital streams which can be recouped back into traditional AV sector activities	Revival of traditional AV markets	Year 2 - 3
4. Assist local filmmakers to access streams of funding e.g., crowdfunding/ private funds	Create new funding streams outside of institutional structures.	Year 2 - 3

<sup>3</sup> Serves as an example of possible criteria that may be prescribed. Actual full set of criteria can be created in the operationalisation of the strategy

## Measuring Outcomes

Interventions	Outcomes	Outcome Indicator
Establish a Technology Innovation Fund	A funding model and stream that assists local filmmakers	Number of projects awarded funding through fund
Reassess funding criteria on existing streams of funds to support digital content	A dynamic funding model that can adapt to tech needs	Number of digital content projects awarded funding
Increase revenue from new digital streams which can be recouped back into traditional AV sector activities	Revival of traditional AV markets	Number of traditional market projects awarded funding
Assist local industry participants to access streams of funding e.g., crowdfunding/ private funds	Create new funding streams outside of institutional structures.	Number of crowdfunding/private funding initiatives

## Key Risks and Mitigation

Interventions	Key risks	Risk Mitigation
Establish a Technology Innovation Fund	Lack of projects that meet the required fund criteria	Outreach programs for stakeholders to communicate the fund guidelines and process. Relook at the requirements for fund applications
Reassess funding criteria on existing streams of funds to support digital content	Lack of competitive digital industry to justify a reassessing of funding criteria	Encourage strategies to deliberately grow the local digital/internet based market
Increase revenue from new digital streams which can be recouped back into traditional AV sector activities	Poor performance in new digital streams	Encourage strategies to deliberately grow the local digital/internet based market
Assist local filmmakers to access streams of funding e.g., crowdfunding/ private funds	Low levels of funds available	Invite proposals to enhance funding applications in line with needs.

**6.3.5. Continuous improvement through research and development**

## Impact

**Impact** Ongoing research and development to stay abreast with technological changes in a rapidly expanding market

### Explanation

This strategic impact is in response to the everchanging nature of technology in the AV sector. Ongoing research and development are an important factor to stay abreast with technological changes in a rapidly expanding market. As for most industries that have been disrupted by the fourth industrial revolution, training and skills development should become a continuum rather than a periodic intervention. The KZN AV sector must be able to respond to emerging trends and development to remain ahead of the curve.

This strategic impact embraces information sharing about training and knowledge with local and international development organisations and thus encourages partnerships and collaboration to foster innovation.

### Interventions and Outcomes

Table 8: Interventions for continuous learning through research and development

Interventions	Outcomes	Implementation
1. Conduct annual assessments of the industry	Clear understanding of which segments of the industry require transformation and the ability to track progress over the next 3 – 5 years	Year 1 - 3
2. Commission research projects into new technologies in the sector regularly	Perpetuate the diversified and transformed nature of the industry.	Year 1 - 3

### Measuring Outcomes

Interventions	Outcomes	Outcome Indicator
Conduct annual assessments of the industry	Clear understanding of which segments of the industry require transformation and the ability to track progress over the next 3 – 5 years	Number of assessments and findings Programmes which have a measurable impact on the sector as a result of reliable data and impact assessments
Commission research projects into new technologies in the sector regularly	Perpetuate the diversified and transformed nature of the industry.	Number of research projects

### Key Risks and Mitigation

Interventions	Key risks	Risk Mitigation
Conduct annual assessments of the industry to assess current levels	Lack of funding to conduct research	Seek partnerships to leverage funding of national and international research topics.
Commission research projects into new	Low levels of implementation of findings	Develop systems to monitor and track that

technologies in the sector  
regularly

recommendations  
implemented

are

## 6.4. Investment Requirements

This section sets out the detailed action plan and CAPEX budgets in order to measure and quantify the investment requirements for the KZN AV sector. It is important to note that the CAPEX budgets presented in this section are estimates and are not based on actual quotations received from suppliers. Actual figures may be included in the operational phase of this strategic plan.

### 6.4.1. Short to Medium Term Plan

Table 9: Short to Medium Term Plan and Budgetary Allocations

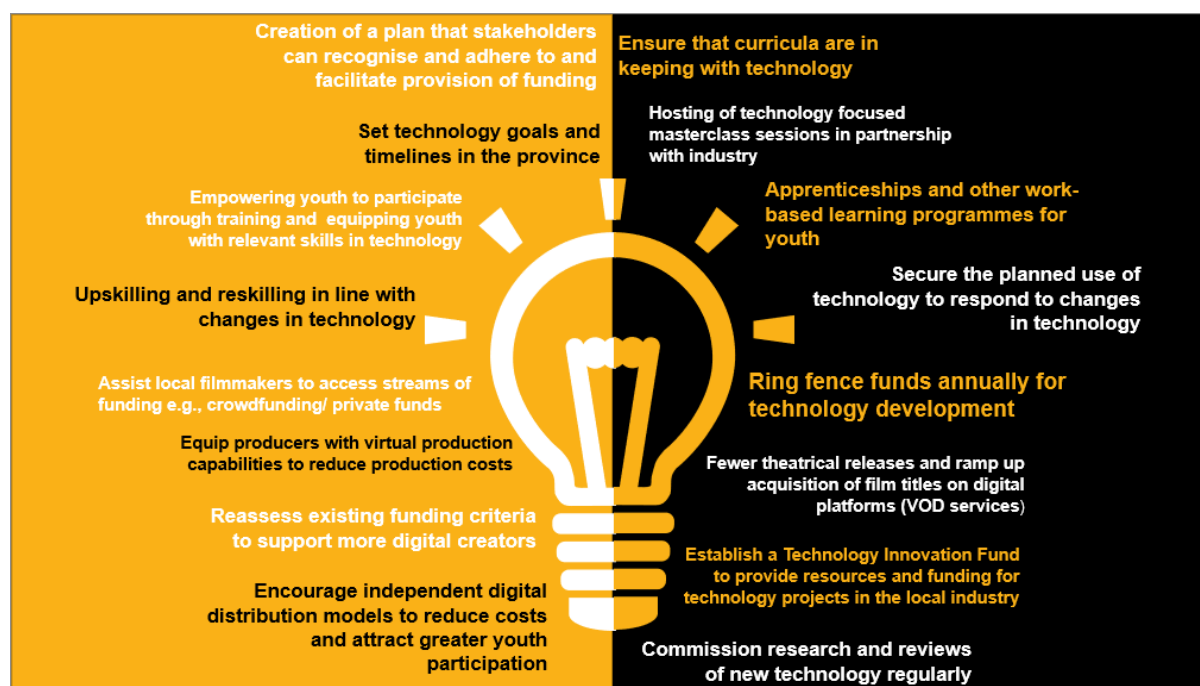
SHORT to MEDIUM TERM (1 – 3 YEARS)			
Area of Intervention	Project Description	Budget Allocation (Annual)	Responsibility/Social Partner
TV	Distribution through OTT services	R650 000	KZNFC, private sector (Showmax, Netflix)
	Autonomous drone technology	R500 000	Private sector
Film/Cinema	Remote/virtual production studios	R450 000	KZNFC, NFVF, GFC
	3D graphic software	R500 000	Private sector
	Digital events and exhibitions	R100 000	KZNFC, NFVF
Internet	Financing for start ups	R100 000	KZNFC, DTI, NFVF, private sector, TIKZN
	Smartphone filmmaking gear	R50 000	Private sector
Multimedia	Dual camera Virtual Reality	R750 000	Private sector
	Artificial Intelligence (AI) capabilities	R50 000	Private sector
ALL	Technology Innovation Fund	R1 000 000	KZNFC, DTI, NFVF, private sector, TIKZN
	AV sector Technology and Innovation Strategy	R200 000	KZNFC, EDTEA, NFVF
	Research and Development	R250 000	KZNFC

## 7. CONCLUSION AND RECOMMENDATIONS

In conclusion, the research established that the AV sector in KZN is a vast sector with extensive networks throughout all aspects and dimensions of the modern technological-driven economy. The AV sector is also heavily influenced by changes in technology. Globally, technology, digitisation and innovation are rapidly expanding, accelerated by the restrictions brought on by the Covid19 pandemic as people adjust to the 'new normal'. Components of the sector such as the traditional film markets, that have been negatively affected by the pandemic and the lock-down of the economy that followed. Responses to Covid-19 have fast tracked the adoption of digital technologies with the share of digital and digital enabled products accelerating rapidly in the sector.

The traditional audio-visual market has thus evolved due to the dual impact of a rapidly changing and accelerated advancements in technology and the impact of the Covid19 pandemic. Having established the ever-changing context the KZN AV sector operates in, it is critical that a bold strategic plan for harnessing technology within the sector be established to guide the KZNFC along with all the relevant stakeholders in collectively building a thriving and robust AV sector in the region. Within the KZN context, embracing new opportunities within the technology sector could give new impetus to the sector.

The following are the high level recommendations that will enable the industry to access greater support to drive its rapid recovery and regain its important contribution to the KZN economy.





A detailed strategic plan was developed to give detail to these high level suggestions and the below table gives a summary of the recommended interventions in the short to medium term.

Table 10: Summary of recommended interventions in the short to medium term

Interventions	Outcomes	Implementation
1. Work with industry to assess current levels of technology use and identify short- medium- and long-term technology needs per market segment	Necessary metrics to understand how technological the industry is so that advancement can be driven in the right areas of the industry	Year 1 - 2
2. Work with industry to set technology goals and timelines	A clear plan and roadmap to drive and measure changes across the industry.	Year 1 - 2
3. Work with industry to develop a focussed marketing and budget plan for technology	Creation of a plan that stakeholders can recognise and adhere to	Year 2 - 3
4. Development of an AV sector Technology and Innovation Strategy	Attainable goals to achieve the longer-term vision and facilitate provision of funding.	Year 3
6. Conduct an industry skills baseline assessment to identify the skills gaps regarding technology in the industry	Required metrics to understand needs	Year 1 - 2
7. Work with industry to develop tech focused masterclass sessions for upskilling	Transfer of skills, growth in depth and resilience of skills in the industry	Year 2 - 3
8. Establishment of partnerships with industry, training, and educational institutions to create a feeder system for incoming skills	Bridge the gap between training and educational institutions and industry	Year 2 - 3
9. Leverage on existing FITI programme to develop technology training and innovation skills programme	Focus existing resources on expanding the sector	Year 1 - 3
10. Drive apprenticeship programmes for new entrants	Transfer of practical skills in the industry	
11. Identify potential investors and develop a database of investors	Create a growing list of investors applicable within the film industry	Year 1 - 2
12. Ring fence funds in the annual budget allocated to technology development	Pooling of funds that remain available for use in technology infrastructure provision	Year 2 - 3
13. Establish a Technology Innovation Fund	Create a funding model and stream that assists local filmmakers to access required funding to acquire technological solutions	Year 1 - 2
14. Reassess funding criteria on existing streams of funds to support digital content	A dynamic funding model that can adapt to tech needs	Year 1 - 2
15. Increase revenue from new digital streams which can be recouped back into traditional AV sector activities	Revival of traditional AV markets	Year 2 - 3

16.	Assist local filmmakers to access streams of funding e.g., crowdfunding/ private funds	Create new funding streams outside of institutional structures.	Year 2 - 3
17.	Conduct annual assessments of the industry	Clear understanding of which segments of the industry require transformation and the ability to track progress over the next 3 – 5 years	Year 1 - 3
18.	Commission research projects into new technologies in the sector regularly	Perpetuate the diversified and transformed nature of the industry.	Year 1 - 3

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