Emerging trends in Motion Picture Experience & Theatres



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DECLARATION

This thesis is my original work and has not been submitted for the award of a degree or any other academic qualification in this or any other University.

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DEDICATION

For my parents, who have always been there.

For the Cinephiles, here's to you.

And to Motion Picture

for its characteristic forte of being able

to capture and communicate

the intimacies of the human mind.

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ABSTRACT

This study is an investigation of Motion Picture experience and Motion Picture theatres, highlighting its origins and developments. The scope of the study, in terms of fieldwork, is limited to the county of Nairobi. In this case, a few selected motion picture spaces with the most recent dates of premier and those with high levels of patron attendance were selected to represent all the Motion picture spaces and experience for the larger Nairobi County. Five local case studies in the County were analysed in the study and the selection of samples was based on their location within Nairobi, accessibility to the author, recentness of design, level of technological advancement advertised, availability of relevant information & documentation of case studies, quality of the variables and subjective judgement of the researcher as opposed to random selection. This has been done through the use of both primary and secondary sources. Numerous sources are cited for information on the history and evolution of Motion Picture globally as well as locally in the country. The findings of the fieldwork conducted showcase the state of the Motion picture experience and exhibition spaces in the Nairobi county and the conclusions of the study highlight the recommendations of what to consider when approaching the Motion picture exhibition space from a designer's perspective with the user in mind.



INTRODUCTION

The coming of the motion picture was as

important as that of the printing press.

William Randolph Hearst

Movie production worldwide



2015

Fig. 1-1 World map depiction showing how film is a global affair in multiple countries.

Source: http://blog.world-statistics.org/2017/04/cinema-data-release-uis.html



Fig. 1-2 A representation of the intersection between Arhitecture and Motion Picture disciplines. Source: Author

1.1 Background of Study

Cinema is a product of 19th century scientific endeavour such as electricity and photography and it has become an industry employing thousands of people as well as a medium of mass entertainment & communication.

Architecture and cinema intersect in that a film has to be viewed in a space designed explicitly or broadly for this experiential activity. The design of such spaces necessitates architectural solutions that not only respond to the dispersion and arrangement of seats and visibility for patrons yet additionally to acoustics and lighting both artificial and natural.¹ Architecture should respond to this challenge in innovative ways as society advances technologically.

It is hard to envision film occurring in a vacuum, the space required for exhibition is important and also aids in transporting the viewer away from reality into the realm of the film they are immersed in.² Again, the interaction between cinema and architecture termed as "the inherent architecture of cinematic expression and the cinematographic essence of architectural experience" by Jean-Luc Godard (1986) is presented as a complex, often multifaceted dialogue between both disciplines in a bid to better both for the user.

No single person has been credited as having invented cinema however, in 1891 the Edison Company in the USA effectively exhibited a model of the Kinetoscope, which allowed solo viewing of moving pictures.³ This kick-started the rush for Motion picture experience worldwide with the Lumière brothers leading by exhibiting projected moving pictures to a paying audience for the first time in December 1895 in Paris. By 1914, several national film industries were established in Europe and North America with films becoming longer and storytelling more dominant. The industry grew as more people paid for viewing and investors invested more in the production, distribution and exhibition, eventually large studios were established and special motion picture viewing spaces built.⁴

¹ https://www.archdaily.com/903851/cinemas-and-movie-theaters-examples-in-plan-and-section
² Pallasmaa, J. (2007). The Architecture of Image: Existential Space in Cinema. Helsinki: Rakennustieto Publishing.
³ https://blog.scienceandmediamuseum.org.uk/very-short-history-of-cinema/
⁴ Navaell Smith C. (2000). The Oxford United United Space Oxford, Oxford University Press.

⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.



Fig. 1-3 Depiction of Newcastle's Odeon cinema in 1940s. Source: https://newcastlephotos.blogspot.com/2017/12/old-photos-ofodeon-cinema-paramount.html



Fig. 1-4 A modern cinema hall in Paragon Cineplex Bangkok. Source:

https://www.overseasattractions.com/inspirational/bizarre/paragoncineplex-bankok-movies-ticket-prices-cinemas/ World War One significantly limited the film industry in Europe while the North American industry grew in relative importance. The pioneer years were bolstered by the growth and consolidation of an industrial base, the developments of narrative forms in screenplay, story and plots and the overall adoption, reinvention and fine tuning of technology.⁴

The development and refinement of science and technology has contributed in shaping the modern day Motion picture theatre from its humble beginnings where only solo viewing was capable to mass viewing in small exhibition spaces. Small rooms that housed inventions like the vitascope became popular during the pioneer years and eventually, nickelodeons, where folks could see movies for an USA nickel, were formed. With the advent of Hollywood and the studio system, lavish movie viewing houses were constructed to appeal to mid and upper societal classes. By the 1930s you could get snacks and other concessions with your film and by the 1950's drive-ins were popular.⁵CinemaScope technology for example, was the latest trend in the 1960's and currently it's all about the IMAX technology and total immersive environment experiences. Throughout the years, cinema in general has come quite a long way.

Currently, productions may still be shot on film but most subsequent processes, like editing and special effects are done on computers and transferred back to film. The need for this final transfer is diminishing though as technology sweeps in and more cinemas invest in digital projection which is capable of producing screen images that rival the sharpness, detail and brightness of traditional film projection and even best it.

1.2 Problem Statement

Since the invention of cinema in the 19th century, motion pictures have transported people across the world into different times and places. As soon as the invention found its footing, people began to come together to see films.⁶ People are inherently drawn to narrative and Motion Pictures provide this through story-telling and shared experiences.

⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.
⁵ Welling, D. (2007). Cinema Houston : From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.

⁶ https://www.britannica.com/art/history-of-the-motion-picture



Fig. 1-5 4DX immersive experience poster that promises to appeal to the human senses.

Source: http://brockstargaming.com/4dx-changes-way-see-movies/

In the past 30 years (1989-2019), film production and reception has been profoundly altered by the impact of rapidly improving digital technology.⁵ The author has sought to explore the impact of this on the local scene by investigating Film exhibition spaces and their impact on patrons.

The overall strategic direction of Kenya stipulated in Vision 2030 endeavours to make the Country "a globally competitive and prosperous Nation, with a high quality of life for all citizens by 2030". This can be achieved in one way by upgrading the Film industry in the country both in production and exhibition of films. There is a challenge in that the local industry has started embracing the technology but is lagging behind across the globe. The author has sought to explore and borrow the experiential effects of Motion picture spaces across the globe for the local context to better it.

The successful design of cinema theatres is greatly influenced by patron experience. Through the introduction of sound into motion picture, acoustics joined too as part of the total experience. In the exploration of motion picture spaces therefore, acoustics has to be considered in part with the visual dynamic. The overall quality of these large gathering spaces has to consider indoor noise as well as outdoor noise.

The bibliography on the matter of Motion Picture spaces moving from being more than exhibition spaces to more interactive hubs for patrons is scarce and presents the opportunity which the author intends to explore in Cinema design for the modern day and provide a piece that will add to the wealth of knowledge.

Having access to relevant academic material, research into noise control design as a facet of the Motion picture experience will be done and the inadequacies or lack thereof in selected local cinema theatres will be investigated. Additionally, measures that can be adopted to improve these facilities will be endorsed.

⁶ https://www.britannica.com/art/history-of-the-motion-picture



Fig. 1-6 3D of a modern multiplex in the Revamped Paris Alsia Cinema. Source:

http://www.crismatec.com/1494882070/mnc/5bde51ad1e203153/

 ⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.
⁵ Welling, D. (2007). Cinema Houston: From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.



Fig. 1-7 The ARRI ALEXA 65 digital camera that results are extraordinary images and 26% more picture when projected at IMAX theatres. Source: https://ymcinema.com/2019/03/04/avengers-endgame-trailer-as-a-reference-for-imax-comparison/



Fig. 1-8 A theatrical screening at Irvine Spectrum Center, California. Source:

https://www.irvinespectrumcenter.com/entertainment/movies/theater-features

1.3 Research Objectives

- To explore the emerging trends in motion picture experience and theatres in Nairobi.
- To analyse the impact of these trends on the spatial arrangement and planning of motion picture theatres in Nairobi.
- To derive lessons and give recommendations that can be learnt in the design of motion picture theatres for enhanced user experience in the modern era within Nairobi.

1.4 Research Questions

- What are the emerging trends in motion picture experience and theatres in Nairobi?
- How have these trends impacted on the spatial arrangement and planning of motion picture theatres in Nairobi?
- What are the lessons learnt that can be used in the design of motion picture theatres for enhanced user experience in the modern era in Nairobi?

1.5 Justification & Significance of the Study

The government of Kenya has set a vision 2030 mandate that aims to transform Kenya to an industrialized, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment.⁷ One of the goals is to create employment to the youthful people of Kenya. The youth are a talented group in the country and they are continually getting involved in performance activities. They need spaces for social interaction, entertainment and hosting their events. The need for such kinds of spaces will lead to increased construction of performance theatres, motion picture theatres, concert halls and auditoriums.

The arts have also been brought back into the curriculum of Kenya's primary school education.⁸ Therefore the youth who want to venture into acting as a career will require avenues for their

⁷ The Kenya Vision 2030 © Government of the Republic of Kenya ⁸ Kenya Institute of Curriculum Development (2013)



Fig. 1-9 Depiction of Outdoor film screening experience. Source: https://www.iamexpat.nl/lifestyle/lifestyle-news/outdoorcinema-film-screenings-amsterdam

local content to be accessed by the public and motion picture theatres that will provide this avenue become a necessity. Under the Gender, Youth & Vulnerable Groups ministry, the government promises to provide facilities for talented actors & producers to exhibit their works in a bid to become a competitive destination for global investors in the Film Industry.

The study intends on contributing to suitable strategies to use for motion picture theatres to construct auditoriums for the local industry. The study will also look into materials and techniques that can be used by architects to design cinemas to global standards and for good quality of user experience.

1.6 Scope and Limitations of the Study

All cinema spaces need to have good acoustics to enhance auditory comfort of the audience. While architectural acoustics considerations are numerous, this thesis will look into noise control in auditoriums design as an aspect of acoustics.



Fig. 1-10 Depiction of Dolby Laboratories proprietary Dolby Cinema entailing both Dolby Vision and Dolby Atmos technology for captivating user experience.

Source: https://www.dolby.com/us/en/platforms/dolby-cinema.html

To facilitate the study, five local case studies in the County were analysed in the study. The selection of samples was based on their location, accessibility, availability/quality of the variables and subjective judgement of the researcher as opposed to random selection.

1.7 Research Approach

The study will include the following methods of data collection in compiling an informed literary piece:-

- Literature review of published works
- Literature review of un-published works
- Interviews & Questionnaires
- Observational analysis
- Internet sourcing

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

1.8 Organization of the Study

This chapter begins with a brief background asserting the past and current state of the subject, followed by a brief explanation of the research problem. Consequently, research questions of the study are stated, leading to the formulation of the research objectives. Accordingly, the author justifies the research, states its significance and highlights the scope and limitations. The chapter concludes with the organisation of study and a definition of terms used in the study.

The second chapter formulates a foundation of the study through the examination of various literature on Motion Picture in general. It begins with a history of Motion Picture and expounds on the development over time. In the second part, it establishes factors to consider when designing rooms for cinema and the issue of noise control in terms of acoustic defects and acoustical materials. To ground the study, it discusses the most critical factors that influence the design of cinema auditoria which help in creating a guideline to evaluate selected case studies.

Founded on the insights from the literature review in the second chapter, this chapter outlines the research methodology to be employed to answer the research questions outlined in the first chapter. The selected research approach is the case study based approach. This chapter also provides a breakdown on the criteria for selecting the case studies, as well as the criteria upon which they will be evaluated. Additionally, it explains the data collection and data presentation methods that will be used before highlighting the time horizon of the study.

Based on the established guidelines from the literature review in the second chapter and the set research methodology in the third chapter, this chapter examines the local case studies based in Nairobi. The fourth chapter investigates all the selected local case studies to determine what they've done and comparatively analyses how them across the board. The findings of the fieldwork by the author are reported herein.

The final chapter answers the research questions by concluding the topic of study. The conclusions drawn highlight the analysis of the selected cases studies and the global standards that are employed. This formulates issues and factors that promote human sensorial comfort in the motion picture spaces. Finally, the chapter highlights possible fields of study to which it recommends further research to be carried out by interested parties in the future.



Fig. 1-11 A 4DX equipped cinema auditorium which has become the main attraction in the Nordisk Ringen Theatre, Norway 2018. Source: https://www.dailyscandinavian.com/4dx-theatre-technologyexpanding-scandinavia/



Fig. 1-12 A standard Scene board & Film reel predominantly used in film production. Source: https://pngimage.net/montage-video-png/

1.9 Definition of Terms

Augmented reality - abbreviated as AR, refers to computer-generated content that is overlaid onto the real world environment.

Cinerama - a widescreen process that projected images simultaneously from three synchronized 35mm projectors onto a huge 146° arc curved screen.

CinemaScope - an anamorphic lens series used for shooting wide screen movies from 1953 to 1967. Its creation in 1953, by the president of 20th Century-Fox, marked the beginning of the modern anamorphic format in both principal photography and movie projection.

Cinematographé -a device developed by the Lumiére bothers in Lyon. France that serves as a motion picture film camera, projector and printer too.

Decibel - A basic metric for describing the magnitude of sound.

Digital Media Re-mastering - abbreviated as DMR - a process that upgrades conventional film format to IMAX format for digital release and exhibition.

Digital Cinema Initiatives - abbreviated as DCI - a joint venture of major motion picture studios formed to establish a standard architecture for digital cinema sytems.

Dolby Cinema - a premium cinema offering from Dolby company, that combines powerful image and sound technologies with a breakthrough design that is created to maximize their impact while revolutionizing the total cinema experience.

Dolby Digital - an audio compression format that supports channel configurations from mono up to six discrete channels that first allowed and popularized surround sound.

Echo - A reflected sound of enough intensity that delays in arrival and is heard as distinct from the source.

Frequency - The number of complete cycles per second of a vibration, measured in Hertz (Hz). Fox Grandeur - a 70mm widescreen film format developed and used by William Fox through his Fox Film corporation during the 1920s-1930s.

Grand Theatre rotor - abbreviated as GT - a big rolling loop projector made by IMAX in the 1970s. High definition - abbreviated as HD - a display resolution measuring 1280X720 pixels, more pixels means sharper image quality.

IMAX Digital Format - abbreviated as IDF - a superset of Digital Cinema Initiatives for IMAX.

Haptic perception - a combination of tactile, kinaesthetic and proprioceptive functions that allows us to determine what a foreign surface feels like, as well as its relation to our body. Intensity - The rate of sound energy propagated in a specific direction over unit area. Kinetoscope - an early motion picture exhibition device designed for films to be viewed by one individual at a time through a peephole viewer window at the top of the device.

Magnascope - a device for temporary enlarging the picture on the cinema screen using a wideangle magnifying lens system attached to the projector.

Megaplex - a term coined to refer to a large Multiplex with 16 or more screens.

Multiplex - a large cinema complex exhibiting multiple screens usually more than 5 up to as many as 12 screens.

Nickelodeon - small film exhibition rooms so called because admission was usually five US cents(nickel) that appeared throughout the downtown districts of all the major and midsized cities of America.

Persistence of Vision - a phenomenon observed when a series of still images are shown rapidly in front of a viewer's eye, and merge into one registered image that appears to show movement. Thaumatrope - a scientific toy devised in the 19th century consisting of a disc with a different picture on each of its sides, that appear to combine into one image when the disc is rapidly rotated.

THX systems - an audio systems company acronym for Tomlinson Holman's experiment developed by Tomlinson in 1983 and currently involved in Motion Picture sound industry. Virtual Reality - abbreviated as VR - simulated environment & experience created by computer technology.

VistaVision - a form of widescreen cinematography employing the use of 35mm film to give larger projected image using ordinary methods of projection.

Vitaphone - a major analogue sound-on-disc film system made by Warner Bros. company and used for feature films between 1926-1931 being very commercially successful.

Vitascope - an early film projector first demonstrated in 1895 by Charles Francis Jenkins and Thomas Armat.



LITERATURE REVIEW

I consider the greatest mission of the motion picture is first to make people happy . . . to bring more joy and cheer and wholesome good will into this world of ours.

And God knows we need it.

Thomas A. Edison



Fig. 2-1 Depiction of the basic drives that the author surmises are involved in 'whole design'. Source: Author



Fig. 2-2 Patron using the Kinetoscope & an image showing the Interior view of Kinetoscope with peephole viewer at top of cabinet Source: https://todayinottawashistory.wordpress.com/tag/thomas-edison/

2.1 Introduction

With the changing times, architectural design has devolved into 3 basic drives i.e. Function, Aesthetics and Experience. The three aspects will be focused on this study, whereby the targeted space is the Motion Picture Theatre and the primary user of the space is the patron. A Motion Picture theatre is designed to provide an intimate environment for an audience, particularly for watching motion pictures. The space should meet the 3 facets of function, aesthetic and experience to provide the user with the best.

2.2 History of Cinema

Cinema is a product of late 19th century scientific endeavour and it has become an industry employing thousands of people as well as a medium of mass entertainment & communication. There exists a notion that Cinema is a spectacle, a social experience that one cannot simply get at home by themselves.

2.2.1 Origin of Term

Apart from North America most English-speaking countries use the term cinema, alternatively spelled and pronounced kinema.⁹ The terms, as well as their derivative adjectives "cinematic" and "kinematic", ultimately derive from Greek (*kinema & kinematos*) meaning "movement"& "motion". In the countries where these terms are used, the word "theatre" is usually reserved for live performance venues.

2.2.2 Invention of motion picture

The development of an understanding of image movement and the simulations of movement date as far back as to 1828, when Paul Roget discovered the phenomenon he called "persistence of vision". Roget showed that when a series of still images are shown rapidly in front of a viewer's eye, the images merge into one registered image that appears to show movement, anoptical illusion, since the image is not actually moving.¹⁰

⁹ Kinema - a journal for film and audiovisual media (http://www.kinema.uwaterloo.ca) ¹⁰ Lewis, J. (2008). American Film: A History. New York: W.W. Norton.



Above: How the designs of the two sides are placed with respect to each other. Below: The combined image when the thaumatrope is twirled.

Fig. 2-3 Depiction of the Thaumatrope. Source:

https://intelligentheritage.wordpress.com/2010/09/18/interesting-optical-device-thaumatrope/



Fig. 2-4 Depiction of the first film poster in 1900s Paris by the Lumiere brothers and a later poster for the silent era of film also in Paris in the 1920s .

Source: sothebys.com

This experience was further demonstrated through Roget's introduction of the thaumatrope, a device which spun a disk with an image on its surface at a fairly high rate of speed.¹⁰

The French brothers named Louis and Auguste Lumière's first film, Sortie de l'usine Lumière de Lyon, shot in 1894, is considered the first true motion picture. They followed with their 1895 film L'Arrivée d'un train en gare de La Ciotat, whose first commercial screening took place in Paris on 28 December 1895.

The new art form developed with its own auditorium type dubbed the cinema. The acoustic requirements for cinema are not particularly stringent and in order to maximize the audience size the obvious plan form is the fan shape, originally developed so successfully by the ancient Greeks for outdoor theatre.¹¹ Patrons had built the large concert halls of the mid-1800^s to best feature the work of the classical period, therefore cinemas evolved from hard-surfaced theatres with stages and balconies to soft-surfaced neutral spaces better to control sound reflections and reverberance than to cede the onus to the room's quirks.¹²

The movie theatre would evolve from the ordinary theatres to the performance hall to the nickelodeon and reach its grandest heights in the opulent palaces of the twenties. Still ahead would be the deco-based neighbourhood theatres, the drive-ins, the multi-cinemas, the large multiplexes of the eighties & nineties and the stadium-seat auditoriums of the new millennium.

2.2.3 Silent Era of motion picture (1894-1929)

From 1894 to the late 1920^s, motion picture theatres showed silent films, which were films with no synchronized recorded sound or dialogue. In silent films for entertainment, the dialogue was transmitted through muted gestures, mime and title cards, which contained a written indication of the plot or key dialogue. During silent films, a pianist and organist or in large cities, even a small orchestra would often play music to accompany the films. Pianists and organists would either play from sheet music or improvise while an orchestra would play from sheet music.

¹⁰ Lewis, J. (2008). American Film: A History. New York: W.W. Norton.

¹² Ermann M. A. (2015). Architectural Acoustics Illustrated (2nd ed.). New York: John Wiley & Sons.

¹¹ Barron M. (2009). Auditorium Acoustics and Architectural Design (illustrated & revised ed.). Abingdon: Routledge Publishing.



Fig. 2-5 A vitaphone technician examines the machine. Source: https://forums.tcm.com/topic/44234-the-post-an-interestingpic-thread/page/31/



Fig. 2-6 Poster of the Jazz Singer film which had synchronized dialogue. Source: https://www.imdb.com/title/ttoo18037/

2.2.4 Sound Era of motion picture (1930-1960)

At the end of the 1920s the cinema underwent a revolution. The centre of this revolution was the introduction of synchronized sound dialogue, but it affected other areas as well, leaving very few untouched. It was a revolution that began in America and spread inexorably to the rest of the world, though certain aspects of it had a specific European inflection and some remote corners of the world did not feel the effects of any of it for some time.

The idea of combining motion pictures with recorded sound is nearly as old as film itself, but because of the technical challenges involved, synchronized dialogue was only made practical in the late 1920s with the perfection of the Audion amplifier tube and the introduction of the Vitaphone system.¹³ One effect of the coming of sound was a consolidation of the studio system, at the level of production. Films became an increasingly industrial product, while the boundaries of the industry extended to overlap with the burgeoning music recording business.

In 1927, Warner Bros. Company released 'The Jazz Singer', that contained what is generally regarded as the first synchronized dialogue and singing in a feature film. While the coming of sound can be seen as a phenomenon internal to the cinema and music industries, it coincided with important events in the world outside. The rise of Fascism in Europe affected not only the Fascist countries themselves but the political culture of resistance in Western Europe.⁴ Experimental film-makers turned increasingly to documentary and to themes of social and international struggle. In the late 1930s the Japanese attack on China was followed by Germany's invasion of Czechoslovakia, Poland and France, until by the end of 1941 the whole world was engulfed in World War 2. The end of the war in 1945 meant a new beginning for the cinema in a number of countries. In East Europe and China the cinema revived rapidly after the devastation of war, but it was also subject to bureaucratic control by the newly installed Communist regimes. In Germany, Italy, and Japan the problem was one of creating a new cinema that would not be tainted by the legacy of complicity with Fascism.⁴ The independence of India, followed by a steady decolonization throughout Asia and Africa, aligned the cinemas of the emerging nations firmly with the struggle for national self- affirmation.

¹³ https://www.americanhistoryusa.com/topic/silent-film/

⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.



Fig. 2-7 A Television set in use in the early 1940s. Source: https://twitter.com/talkingpicstv/status/936633194744549381

Fig. 2-8 Depiction of the Television in the 1980s. Source: https://www.insider.com/evolution-of-american-living-room-2019-3

2.2.5 TV era and motion picture

Another development whose origins go back a long way but which has assumed increasing importance in the decades since 1960 has been the growth of competing forms of mass media, and especially television. The modern cinema exists in a very different environment from that which prevailed in the silent and early sound periods and both its present form and its potential for future development are shaped by the way this environment has changed and continues to change.⁴

The first challenge to cinema's monopoly together with attendant possibilities of crossover came from radio. This was followed, and intensified, by television, which was in turn been followed by video. Cinema in the Age of Television therefore starts by looking at the steady growth-at first unnoticed, then regarded with hostility, and now the object of an uneasy coexistence-of the rival media which have come to form cinema's environment in the modern period.

The impact of television and related media was felt first in the United States and it was there that strategies first began to be devised to cope with it. Television and the challenge it posed to cinema as traditionally understood was a major factor in the way the film industry and Hollywood in particular, reorganized itself in the 1960s and 1970s. It also promoted technological change as the cinema came to affirm its difference from its small screen rival through CinemaScope and stereo sound while also borrowing from it, notably in the adaptation of light weight equipment for documentary and experimental film-making.⁴

Hollywood revised and liberalized its censorship categories with cinema acquiring a new freedom of expression-but also a new form of market-oriented regulation as films became classified according to the amount of sex and violence regarded as necessary to attract different audiences and age groups into the cinema. The liberalization of censorship can also be seen as part and parcel of a wider process of social change that swept through western society generally in the 1960s. The film dialogue sounds and music began being played through a number of wall mounted speakers. Since the 1970s, subwoofers have been used for low-pitched sounds.

⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.



Fig. 2-9 Depiction of the evolution of Television. Source: https://www.fastcompany.com/3033336/how-the-televisionhas-evolved



Fig. 2-10 Evolution of Visual clarity & resolution over time. Source: http://lomen.con-text.co/video-resolution-chart/8k-video-thatsa-lot-of-pixels-tellyjuice.html

2.2.6 21st Century era of motion picture

In the past 19 years (2000-2019), film production and reception has been profoundly altered by the impact of rapidly improving digital technology. Though productions may still be shot on film, most subsequent processes, such as editing and special effects are undertaken on computers before the final images are transferred back to film. The need for this final transfer is diminishing as more cinemas invest in digital projection which is capable of producing screen images that rival the sharpness, detail and brightness of traditional film projection.

The Digital wave of technology has become the norm where digital cinematography, which is the process of capturing film images using digital image sensors rather than through film stock, has largely replaced the analogue film technology. As digital technology has improved in recent years, this practice has become more dominant. Since the mid-2010^s most of the movies across the world are captured as well as distributed digitally.¹⁴

TELEVISION'S SIX ERAS

A focal point of many first-world households for over half a century, television has moved far beyond a simple means of basic entertainment. Today, the broadcast landscape continues to evolve.



Fig. 2-11 Depiction of the Six eras of Television and the quest for higher image resolution. Source: https://visual.ly/community/infographic/televisions-six-eras



Fig. 2-12 Depiction of Film production with the advent of digital technology in the mid 2000s.

Source: https://www.soundandvision.com/content/podcast-45-david-reisner



Fig. 2-13 A Digital Cinema Initiative compliant digital projector. Source: https://www.apertus.org/opendcp-article

Current digital film cameras with 4k output are approximately equal to 35mm film in their resolution and dynamic range capacity, however, digital film still has a slightly different look to analogue film. Some filmmakers and photographers still prefer to use analogue film to achieve the desired results.¹⁴ The use of digital technology to distribute or project motion pictures has also largely replaced the historical use of reels of motion picture film, such as 35 mm film. Whereas traditional film reels had to be shipped to movie theatres, a digital movie can be distributed to cinemas in a number of ways for example, over the Internet or dedicated satellite links or by sending hard drives or optical discs such as Blu-ray discs.

Digital movies are projected using a digital projector instead of a conventional film projector. Digital cinema is distinct from high-definition television and is not dependent on using television or high-definition video standards, aspect ratios or frame rates. In digital cinema, resolutions are represented by the horizontal pixel count, usually 2K (2048×1080 pixels) or 4K (4096×2160 pixels).¹⁵ As digital cinema technology improved in the early 2010^s, most of the theatres across the world started converting to digital cinemas and now in the 2010^s and as we progress into the 2020^s, most movie theatres are now equipped for digital cinema projection.¹⁵

2.3 Evolution of Motion Picture Theatre Spaces

A movie theatre is a building that contains auditoria for viewing films for entertainment. Most, theatres are commercial operations catering to the general public, who attend by purchasing a ticket. Some movie theatres, however, are operated by non-profit organizations or societies that charge members a membership fee to view films.

The theatre has an auditorium with a sloped seating deck and audience entry/exit points on opposite sides, generally at an intermediate level of the deck. The entry/exit points are generally at ground level and a ground level lobby connects to the access points by aisles outwardly of opposite sides of the auditorium and a projection room is provided above the lobby.

¹⁴ "Film vs. Digital: A Comparison of the Advantages and Disadvantages"

(https://petapixel.com/2015/05/26/film-vs-digital-a-comparison-of-the-advantages-and-disadvantages/) ¹⁵ Leo Barraclough (June 23, 2013). "Digital Cinema Conversion Nears End Game" (https://variety.com/2013/film/news/digital-cinema-conversion-nears-end-game-1200500975/)



Fig. 2-14 Depiction of Hulsey's Queen auditorium theatre in the 1920s. Courtesy of the Harry Ransom Humanities Research Center, University of Texas. Source: https://www.utexas.edu



Fig. 2-15 The Nickelodeon Theater on Smithfield street in Pittsburgh in 1905 and during the first day of operation 450 people watched a film. Source: https://www.visitpittsburgh.com/blog/8-awesome-pittsburgh-innovations/

The allure of the cinema has always been more than merely the sight of moving pictures on a white screen; it is the shared experience, wherein the viewer communes with the movie as well as with the other members of the audience. For the exhibitor, group participation is simply good business sense: more money can be made selling a single product to a group than to an individual. The original peep-show movie loops of Edison's Kinetoscope suffered from that basic limitation; only one person could watch at a time. Realizing this, numerous inventors and entrepreneurs quickly forged ahead to create a form of motion picture that could be shown to a large group of people and Edison and the Lumière brothers led the pack.

2.3.1 Opera House/Theatre

After the 1896 premiere of both the Edison Vitascope and the Lumière Cinématographe, projected moving pictures quickly spread across the nation. These early movies became part of the entertainment programs in opera houses, music halls and early vaudeville theatres, whereas storefront theatres opened up to showcase film as the primary attraction. In addition, films began to find their place in the larger live theatres of the day.

Initially, commercial screenings of motion-pictures for the public were put on in existing theatres and music halls as a novelty, but the main methods of exhibition quickly became either as an item on the programmes of variety theatres or by traveling showmen in tent theatres, which they took around the fairs in country towns. While opera and dramatic performances had their own venues in town, it would take time for the motion picture to find its own home. Movies would be sandwiched between live performances as filler or left to the small storefront rooms.

2.3.2 Nickelodeons

The public quickly developed an appetite for these short films. There was a divide between the upper class that remained in the opera & drama theatres where the lower classes could not afford. This gave rise to the nickelodeons where little was needed to go into business: a vacant storefront, chairs, a projector, a white sheet stretched across the wall and a sign painted on the exterior window. In order to make the room dark, black-painted canvas stretched around the room and there were a few chairs provided. A sheet was used as a screen while admission was usually 5 US cents dubbed the Nickel.⁴



INT, RIOR OF FIRST NICKELODEON IN THE STATES.

Fig. 2-16 Depiction of the first nickelodeon film theatre in the USA. Source: http://cinematreasures.org/blog/2015/6/19/1st-nickelodeonopened-on-this-day-in-1905



Fig. 2-17 Development of the concession stand in early movie palaces. Source:

https://i.pinimg.com/originals/a6/9b/35/a69b354edfc561b111b4ed942087 2ad3.jpg

While the upper class firmly avoided such lowbrow entertainment, immigrant populations, whose lower incomes matched the affordability of this new medium, flocked to it. Nickelodeons, so called because admission was usually five US cents, appeared throughout the downtown districts of all the major and midsized cities of America.⁵

2.3.3 Uniplex / Single-screen theatres/ Movie Palaces

The years between 1910 and 1915 were ones of great change in the movie industry as short films began to grow longer. The film 'Adventures of Kathlyn' in 1913 introduced the format of a serial film and after the success of the nine-reel foreign film 'Quo Vadis?' in 1912, American audiences seemed more accepting of longer lengths. Theatres across America reflected these movie-industry changes as nickelodeons evolved into larger, plusher movie houses. Films, took on more prominence as the decade passed. In addition, theatres paid more attention to customers' comfort and satisfaction, striving to provide comfortable seating, quality music, soundproofed projection equipment and attentive service staffing.⁵

The smaller storefront houses were slowly replaced by more impressive venues designed either exclusively for film or for film–live performance combinations. The natural and logical inspiration for the new breed of theatres was the opera house, in a pared-down, more streamlined style. As the decade progressed, architectural opulence found its way into the design palette of the movie houses.⁵ The configuration of the seating spaces was similar to the opera theatres of the time. The first theatres dedicated to motion-pictures were established at the turn of the century, soon becoming known as cinemas an example being The Vitascope Hall in New Orleans which was opened in 1896 as one of the first such establishments. It showed two exhibitions, one in the morning and one in the afternoon.⁵

Until the multiplex era, prior to show time, the screen in some theatres would be covered by a curtain, in the style of a theatre for a play. The curtain would be drawn for the feature film. Some theatres, lacking a curtain, filled the screen with slides of some form of abstract art prior to the start of the movie.⁴

⁴ Nowell-Smith, G. (1996). The Oxford History of World Cinema. Oxford: Oxford University Press.
⁵ Welling, D. (2007). Cinema Houston : From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.



Fig. 2-18 Depiction of 1930s Drive-In theatre . Source: https://www.considerable.com/entertainment/retronaut/dawn-of-thedrive-in-movie-theater/



Fig. 2-19 Depiction of Post Oak Boulevard-Houston-Texas-1952-Aerial Source: Welling, D. (2007). Cinema Houston : From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.

2.3.4 Drive-Ins

Drive-Ins were an American creation that then moved into other regions. Perhaps more so than any other aspect of the cinema, the outdoor theatre reflected American values. Its beginnings, rise in popularity and eventual decline paralleled the times and preferences of the nation that had created it. The drive-in originated in the early 1930s, rose to prominence in the post-war years after the Second World War and reached its zenith in the 1950s and 1960s.⁵

The 1963 U.S. Census of Business recorded a nationwide total of over 3,500 drive-ins, with gross receipts of \$253 million. By comparison, indoor theatres that year totalled over 9,000 with receipts in excess of \$803 million.¹⁶ The author Kerry Segrave, in his exhaustive history of the drive-in, describes the outdoor theatre as a uniquely U.S.A institution with only Canada and Australia coming close to matching them. For drive-ins to be successful, the country must have had a certain degree of wealth, an abundance of vacant, accessible, relatively cheap land and a car-loving populace the United States of America fit all these requirements.¹⁶

The first true drive-in theatre was built in 1933 in Camden, New Jersey. The man behind it was Richard Hollingshead who had experimented with a 1928 Kodak projector set on the hood of his car and a screen nailed to a tree. Though there were drive-ins as early as the 1910s, the first patented drive-in was opened on June 6, 1933 by Richard Hollingshead in New Jersey.

Hollingshead created it as a solution for people unable to comfortably fit into smaller movie theatre seats. Appealing to families, he advertised his drive-in as a place where "The whole family was welcome, regardless of how noisy the children were."

The success of Hollingshead's drive-in caused more and more drive-ins to appear in every state in the U.S.A and spread internationally as well. Drive-ins gained immense popularity 20 years later during the 1950s and 1960s with the Baby Boomer generation.¹⁷ Drive-ins could only show movies during certain times of the year and were dependent on having decent weather whenever they showed films.

⁵ Welling, D. (2007). Cinema Houston : From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.

¹⁶ Segrave, K. (1992). Drive-in Theaters: A History from Their Inception in 1933. McFarland & Co.



Fig. 2-20 Depiction of an American Drive-In cinema in the 1940s Source: https://www.ebay.co.uk/itm/Vintage-Drive-In-Movie-Theater-PHOTO-Classic-Cars-Screen-/163746509436



Fig. 2-21 Depiction of Elgin Theatre in Ottawa, Canada. Source: http://cinematreasures.org/theaters/7216/photos/256427

During the 1970s, people downsized their cars during the Global oil crisis in order to save money on the inflated cost of gasoline, and this negatively affected the drive-in. To make up for lost revenue, drive-ins began losing their family-friendly atmosphere by showing exploitation films like horror films as well as adult content. The development of the VHS & VCR in the 1980s made it more appealing to stay at home and watch films without paying for films at the drive-in.¹⁷

Slowly, drive-ins began to lose their appeal with the opportunity cost evaluation. For instance, in order to have an effective drive-in, it had to be on at least 15 acres of land and economically speaking, it became more practical for owners to close down their drive-ins in order to sell their land to developers to build the malls or multi-building complexes that were popping up everywhere.

2.3.5 Multiplex

A large complex with two or more screens was created by dividing up an existing cinema and called a Multiplex. Currently, built multiplexes usually have at least six to eight screens and often as many as twelve to even eighteen screens. Canada was the first country in the world to have a two-screen theatre. The Elgin Theatre in Ottawa, Ontario became the first venue to offer two film programs on different screens in 1957 when theatre-owner Nat Taylor converted the dual screen theatre into one capable of showing two different movies simultaneously. Taylor is credited by some sources as the inventor of the multiplex and he later founded the Cineplex Odeon Corporation, opening the 18-screen Toronto Eaton Centre Cineplex, which was the world's largest at the time, in Toronto, Ontario.²⁷

In the United States, Stanley Durwood of American Multi-Cinema now AMC Theatres, is credited as pioneering the multiplex in 1963 after realizing that he could operate several attached auditoriums with the same staff needed for one through careful management of the start times for each movie.

¹⁷ The History of Drive-In Movie Theaters (and Where They Are Now) Posted on June 7, 2017 by New York Film Academy https://www.nyfa.edu/student-resources/the-history-of-drive-in-movie-theaters-and- wherethey-are-now/

¹⁸ "Nat Taylor | Historica – Dominion"

https://web.archive.org/web/20110927040846/http://www.histori.ca/minutes/minute.do?id=10229.



Fig. 2-22 Depiction of the Ward Parkway Center in Missouri in the USA. Source: https://luminousneon.com/portfolio-items/ward-parkwaycenter/



Fig. 2-23 Eaton Centre Cineplex, interior, entrance 1979. Source: https://www.toronto.ca/city-government/accountabilityoperations-customer-service/access-city-information-or-records/city-oftoronto-archives/whats-online/web-exhibits/mandel-sprachmanfonds/mandel-sprachman-fonds-the-cineplex-concept/

Durwood of Kansas City, Missouri was the first person to construct a multiplex inside a shopping mall consisting of two screens and a single projection booth in the United States of America which was called Ward Parkway Center.¹⁸

This system pioneered by Durwood also resized the labour and projection costs. The exhibition form was thus reformed and Durwood's model of multiplex became a standard model and a blueprint for further development of such multiplexes. Multiplexes also had the commercial advantage of less investment per screen, labour and projectionist's prices. These multiplexes were built with cinder blocks and contained two to eight separate theatres each having 100 to 300 seats. The staffing was also done meticulously with the majority being younger fellows in age and who were able to do more within a given time. When other theatres and Drive-Ins were closing down multiplexes were growing in number.¹⁹

Since the mid-1960s, multiple-screen theatres became the norm and many existing venues have been retrofitted so that they have multiple auditoriums and a single foyer area is shared among them. In the 1970s many large 1920s movie palaces were converted into multiple screen venues by dividing their large auditoriums and sometimes even the stage space, into smaller theatres. Because of their size and amenities like plush seating and extensive food/beverage service, multiplexes and megaplexes drew from a larger geographic area than the earlier smaller theatres.²⁰

It is important to be note that all the multiplexes were strategically placed in or near shopping centres. This heralds to the works of Douglas Gomery where it had been observed that during the 1920s almost all the picture palaces were built near market areas. In the 1960s and 1970s in America, multiplexes were not only built near market places but also inside shopping malls.¹⁹ By the early 1970s multiplexes were becoming commercially more viable as the number of persons visiting shopping malls also depended on the multiplex or the number of screens it had.

¹⁸ "Nat Taylor | Historica – Dominion"

(https://web.archive.org/web/20110927040846/http://www.histori.ca/minutes/minute.do?id=10229. ¹⁹ Sarita Bose (2008) Standalone Vs Multiplexes: A Study Of Changing Trends of Exhibition in Indian Cinema. ²⁰ Marich, R. (2013). Marketing To Moviegoers: A Handbook of Strategies & Techniques (3rd ed.). Illinois: SIU Press.

Multiplex Layout



Fig. 2-24 Depiction of a sample Multiplex theatre . Source: https://www.slideshare.net/ruthers64/film-intro-to-multiplex-andmegaplex



Fig. 2-25 Panoramic depiction of an on-going film exhibition inside an Omni-theatre at St. Louis Science Center .

Source: https://www.metropolitanshuttle.com/articles/attractions/st-louis-science-center/

Many would just come to watch a film while others just came for shopping. Since most shopping centres provided free parking spaces, multiplexes used this to their advantage often remaining open till night. Due to this shopping centres that housed the multiplexes also started to remain open till late into the night. In most markets in the States, nearly all single-screen theatres have gone out of business with the ones remaining being generally used for arthouse films, e.g. the Crest Theatre in downtown Sacramento, California, small-scale productions, film festivals or other presentations.²¹

2.3.6 Megaplex

This was a term coined to refer to a large Multiplex with 16 or more screens. The Megaplex model picked up in the First World countries in the 1990s. The first megaplex is generally considered to be the Kinepolis in Brussels, Belgium, which opened in 1988 with 25 screens and a seating capacity of 7,500. The first theatre in the U.S.A built from the ground up as a megaplex was the AMC Grand 24 in Dallas, Texas, which opened in May 1995, while the first megaplex in the U.S.A based on an expansion of an existing facility was Studio 28 in Grand Rapids, Michigan, which reopened in November 1988 with 20 screens and a seating capacity of 6,000.⁵

2.3.7 Omni-Theatre

This was a theatre born from the idea of using a planetarium for film exhibition in the United States of America. Subsequently, theatres that exhibited on domes instead of the normal screen were dubbed Omni-Theatres.

In the late 1960s the San Diego Hall of Science now known as the Reuben H. Fleet Science Center began their search for a large-format film system to project on the dome of their planned 23,160 mm (76.0 ft) tilted dome planetarium. The standard IMAX projector was unsuitable for use inside a dome because it had a 3,650 mm (12.0 ft) tall lamp house on top.

²¹ "Welcome to the Crest Theatre" (http://www.thecrest.com/).Thecrest.com.

⁵ Welling, D. (2007). Cinema Houston : From Nickelodeon to Megaplex (illustrated ed.). Austin: University of Texas Press.



Fig. 2-26 Depiction of a typical Omnimax Theatre cross section. Source: behance.net/8532/

The IMAX Corporation redesigned its system, adding an elevator to lift the projector to the centre of the dome from the projection booth below. Spectra Physics designed a suitable lamphouse that took smaller, 460 mm lamps and placed the bulb behind the lens instead of above the projector. In 1970, Ernst Leitz Canada, Ltd. now ELCAN Optical Technologies won a contract to develop and manufacture a fisheye lens projection system optimized to project an image onto a dome instead of a flat screen.

The dome system, which was called Omnimax, uses films shot with a camera equipped with a fisheye lens that squeezes a highly-distorted anamorphic 180° field of view onto the 65 mm IMAX film. The lens is aligned below the centre of the frame and most of the bottom half of the circular field falls beyond the edge of the film. The part of the field that would fall below the edge of the dome is masked. When filming, the camera is aimed upward at an angle that matches the tilt of the dome. When projected through a matching fisheye lens onto a dome, the original panoramic view is recreated.



Fig. 2-27 Depiction of a modern day Omnimax theatre with a huge NanoSeam (seamless) Dome Screen in Singapore. Source: https://europapark.de

Omnimax wraps 180° horizontally, 100° above the horizon and 22° below the horizon for a viewer at the centre of the dome. Omnimax premiered in San Diego's Balboa Park in 1973, showing Voyage to the Outer Planets produced by Graphic Films and Garden Isle by Roger Tilton Films on a double bill. IMAX has since renamed the system "IMAX Dome", but some theatres particularly those opened before the 2000s continue to call it "Omnimax".²²

The Omni-Theatre boasts a world-class state-of-the-art audio and visual technology with a huge seamless Dome Screen that spans multiple storeys high with the screen wrapping over the audience giving a lateral view of 180° and a vertical view of 125° far exceeding a person's field of vision. ²² The visual impact of the giant screen is breathtakingly beautiful as every scene is beautifully shot with brilliant clarity and depth.

²² "The Omnimax Theatre". Great Lakes Science Center. June 27, 1996. Archived from the original on September 22, 2010.



Fig. 2-28 Depiction of a Kinetoscope Parlour open to paying customers in 1895 USA.

Source: https://www.pinterest.nz/pin/261771797064049759/



Fig. 2-29 Depiction of the Lumiere brothers Cinématographe in use. Source: theculturetrip.com/261771797064049759/

2.4 Evolution Of Technology In Motion Picture 2.4.1 Kinetoscope

The Kinetoscope was an early motion picture exhibition device designed for films to be viewed by one individual at a time through a peephole viewer window at the top of the device. It was not a movie projector but introduced the basic approach that would become the standard for all cinematic projection before the advent of video, by creating the illusion of movement by conveying a strip of perforated film bearing sequential images over a light source with a high-speed shutter. ²³ William Dickson and his team at the Edison lab had devised the Kinetograph, an innovative motion picture camera with rapid intermittent film movement to photograph movies for in house experiments and eventually for commercial Kinetoscope presentations.

The first public demonstration of the Kinetoscope was held at the Brooklyn Institute of Arts and Sciences on May 9, 1893. The Kinetoscope also had a major impact in Europe and its influence abroad was magnified by Edison's decision not to seek international patents on the device, facilitating numerous imitations of and improvements on the technology. In 1895, Edison introduced the Kinetophone.²³

2.4.2 Vitascope & Cinématographe

For the exhibitor, group participation was simply good business sense in that more money could be made selling a single product to a group than to an individual. The original peep-show movie loops of Edison's Kinetoscope suffered from that basic limitation where only one person could watch at a time. Realizing this, numerous inventors and entrepreneurs quickly forged ahead to create a form of motion picture that could be shown to a large group of people and Edison and the Lumière brothers led the pack. The Edison Manufacturing Company's answer was the Vitascope, which served as a blueprint for most of the other movie projectors that followed. In Britain, Robert W. Paul and Birt Acres both independently developed their own systems for projecting a moving image on to a screen. Acres presented his in January 1896 and Paul unveiled his more influential Theatrograph shortly after in February.²⁴

²³ "Inventing Entertainment: The Early Motion Pictures and Sound Recordings of the Edison Companies". Memory.loc.gov. Library of Congress.

²⁴ Mast, Gerald; Kawin, Bruce F. (2007). "Birth" (http://www.ablongman.com/mast9e).In Costanzo, William (ed.). A Short History of the Movies (9th ed.)



Fig. 2-30 A poster advertising the Edison's company Vitascope technology. Source:

https://en.wikipedia.org/wiki/Vitascope#/media/File:Edison's_Greatest_ Marvel-The_Vitascope_-_Restoration.jpg



Fig. 2-31 Depiction of A VistaVision 8 perferation film frame. Source: https://commons.wikimedia.org/wiki/File:VistaVision_8_perf_35_mm_ film.svg After the 1896 premiere of both the Vitascope and the Lumière Cinématographe, projected moving pictures quickly spread across the first world. Initially, a lack of standardization meant that film producers used a variety of different film widths and projection speeds, but after a few years the 35- mm wide Edison film and the 16-frames-per-second projection speed of the Lumière Cinématographe became the standard.²⁵ Vitascope was also used briefly as a trademark by Warner Brothers in 1930 for a widescreen process used for films such as Song of the Flame. Warner was trying to compete with other widescreen processes such as Magnascope, Widevision and Fox Grandeur.²⁶

2.4.3 Proliferation of Diversity

The desire to increase the visual impact of film started in 1929 with Fox introducing Fox Grandeur, the first 70 mm film format, which quickly fell from use. In the 1950s, the potential of 35 mm film to provide wider projected images was explored in the processes of CinemaScope (1953) and VistaVision (1954), following multi-projector systems such as Cinerama (1952). While impressive, Cinerama was difficult to install and maintain, requiring careful alignment and synchronization of the multiple projectors. During Expo 67 in Montreal, the National Film Board of Canada's In the Labyrinth and Ferguson's Man and the Polar Regions both used complex multi-projector, multi-screen systems. Each encountered technical difficulties that led them to found a company called "Multiscreen", with a goal of developing a simpler approach.

The proliferation of television in the early 1950s contributed to a heavy mid-century push for colour within the film industry. In 1947, only 12% of American films were made in colour but by 1954 the number had risen to over 50%.²⁷ The colour boom was aided by the breakup of Technicolor Motion Picture Company's near-monopoly on the medium. The last stand of black-and-white films made by or released through the major Hollywood studios came in the mid-1960^s, after which the use of colour film for all productions was effectively mandatory and exceptions were only rarely and grudgingly made.

²⁵ Microsoft Encarta[®] Encyclopedia 2003. © 1993-2002 Microsoft Corporation.

 ²⁶ Musser, Charles. "The Vitascope." The Emergence of Cinema: The American Cinema to 1907 (1990):
²⁷ David A. Cook. A History of Narrative Film (2nd edition. 1990).



Fig. 2-32 Depiction of Cinemascope 4 perf 35 mm film. Source: http://purvacinema.blogspot.com/2012/07/what-is-cinemascope.html



Fig. 2-33 A poster advertising the 1967 Expo in Montreal. Source: https://www.chairish.com/product/1983612/1967-vintage-montrealposter-expo-67-pink

Fig. 2-34 A poster advertising the 1970 Expo in Osaka. Source: https://www.westkowloon.hk/en/shiftingobjectives/highlights-1645/poster-expo-70-osaka-yusaku-kamekura-japanese-1915-97-1967-30

2.4.4 IMAX

IMAX is an international company with a proprietary system of high-resolution cameras, film formats, film projectors and theatres known for having very large screens with a tall aspect ratio approximately 1.43:1 & 1.90:1 and steep stadium seating.²⁸

2.4.4.1 Origins

A group of Canadian experimental filmmakers came together to produce a multi-screen film installation at **Expo '67** in Montreal. The installation was part of a competition to create the first truly large-screen film experience. The filmmakers did it by syncing nine projectors together. It was a huge technological challenge and as they pulled it off, the ambitious team that would one day start the company to be known as IMAX was faced with another question of whether there was a better way. Over the next three years, IMAX technology was born and its epic camera, projector and domed screen system premiered at the Fuji Pavilion at **Expo '70** in Osaka, Japan.²⁸

The company incorporation was on September 1967 and was first called the Multiscreen Corporation because that was what people knew them as. At a staff lunch one day in Montreal, all the possible names that the founders could think of were formulated and that's how the idea of maximum image came about. This was later turned around into IMAX in 1970.²⁹ What made IMAX stand out from the rest of the field was the quality of their productions, shown on curved screens that were typically 16 meters high by 22 meters wide approximately 52 by 72 feet, about six times the size of a traditional movie screen.

2.4.4.2 IMAX in the 70s, 80s & 90s

The film Tiger Child, was the first IMAX film and was demonstrated at **Expo '70** in Osaka, Japan. The first permanent IMAX installation was built at the Cinesphere theatre at Ontario Place in Toronto and debuted in May 1971, showing the film 'North of Superior'. The Cinesphere was renovated while Ontario Place was closed and re-opened on November 3, 2017 with IMAX 70mm and IMAX with laser illumination. The first permanent IMAX Dome installation, the Eugene Heikoff and Marilyn Jacobs Heikoff Dome Theatre at the Reuben H. Fleet Science Center, opened in San Diego's Balboa Park in 1973 and doubles as a planetarium theatre.

²⁸ "History of IMAX in Timeline" https://populartimelines.com/timeline/IMAX
²⁹ "The History of IMAX " https://www.imax.com.au/news/2013/02/the-history-of-imax/

Fig. 2-35 Depiction of IMAX international company logo. Source: https://variety.com/2018/film/asia/imax-14-site-theater-dealwith-china-resources-1202936304/



Fig. 2-36 A poster advertising the 1986 Expo. Source: https://courses.ecuad.ca/mod/book/view.php?id=64400&chapterid=229 53

Fig. 2-37 A poster advertising the 1992 Expo. Source: https://delineanteloco.wordpress.com/2012/05/28/hello-world/ The first permanent IMAX 3D theatre was built in Vancouver, British Columbia for Transitions at **Expo '86** and was in use until September 30, 2009. It was located at the tip of Canada Place, a Vancouver landmark. ²⁹ Variations on IMAX included the 48 frames per second IMAX HD process, which sought to produce smoother, more lifelike motion, while also reducing the blurring of moving objects, by doubling the normal film rate. The IMAX HD system was tested in 1992 at the Canada Pavilion of the Seville **Expo '92** with the film Momentum. Higher production costs and the high "wear-and- tear" on the prints and projectors, doomed the IMAX HD system, but not before many theatres had been retrofitted to project at 48 frames, especially in Canada, in order to play Momentum.

An early attempt at presenting mainstream entertainment in IMAX format was The Rolling Stones: Live at the Max (1991), an 85-minute compilation of concert footage filmed in IMAX during the rock band's 1990 Steel Wheels tour, edited to give the impression of a single concert. In the 1990s, more entertainment short films were created, notably T-Rex: Back to the Cretaceous in 1998, and Haunted Castle in 2001 both in 3D. In 1995, French director Jean-Jacques Annaud directed Wings of Courage, the first dramatic picture shot for IMAX.²⁸

IMAX went public in 1994, which was around the same time the company began to see the growth potential in Hollywood content. The company built a few theatres in multiplexes across North America including the first in New York City's Lincoln Square, but the ambitious new business model soon ran into trouble. The IMAX founders were still producing a majority of the films being shown on IMAX screens and the handful of other IMAX producers could not make enough IMAX movies to fill all of the available slots in the numerous multiplexes across America. Meanwhile, Hollywood wouldn't make IMAX movies until more theatres were built and therefore IMAX faced a classic "chicken and egg" problem. To solve it, IMAX invented a revolutionary new technology called DMR or Digital Media Re-mastering. This allowed IMAX to work with directors on dozens of ways to enhance a movie and to change the saturation, contrast, brightness and a score of other variables in virtually every frame. It meant the studios

²⁸ "History of IMAX in Timeline" https://populartimelines.com/timeline/IMAX
²⁹ "The History of IMAX " https://www.imax.com.au/news/2013/02/the-history-of-imax/



Fig. 2-38 Depiction of IMAX's GT projector. The pipes going into the roof are to cool the overall projector and Xenon bulb. Source: https://commons.wikimedia.org/wiki/File:Birmingham_IMAX_Tour_-IMAX_GT_Projector.jpg



Fig. 2-39 Depiction of IMAX GT 3D projector systems. Source: https://widescreenmovies.org/WSM11/3D.htm

could transform their most exciting movies into even more exciting IMAX movies. The first film to employ this technique was Apollo 13 and it met with tremendous acclaim many months after the movie's original release and after that, Hollywood's romance with IMAX blossomed.²⁸

2.4.4.3 IMAX in the 21st Century (2000-2008)

In 1996, IMAX was awarded the Oscar for Scientific and Technical Achievement by the Academy of Motion Picture Arts and Sciences. The award cited IMAX's innovations in creating and developing a method of filming and exhibiting large format, wide-angle motion pictures. More (1998) and The Old Man and the Sea (1999) became the first films produced using the IMAX format; both earned Academy Award nominations, with Old Man and the Sea becoming the only IMAX film to win an Oscar.²⁸ Walt Disney Pictures became the first studio to release theatrical films in the IMAX process by releasing on New Year's Day in 2000, their film titled Fantasia and this was the first theatrical feature presented in IMAX theatres.

IMAX's proprietary Digital Media Re-mastering, a process that up-converts conventional films to IMAX format was perfected during this period. This special digital intermediate technology let IMAX venues show films shot on 35mm for conventional theatres.³⁰

Reviewers generally praised the results of the DMR blow-up process, which are visually and audibly superior to the same films projected in 35mm but are not comparable to films created directly in the 70 mm IMAX format. IMAX originally reserved the phrase "the IMAX experience" for true 70 mm productions but now allows its use on DMR productions as well. IMAX had four projector types during this time that used its 15-perforation, 70 mm film format:-

GT (Grand Theatre rotor),

✤ GT 3D (dual rotor),

- SR (small Rotor) and
- ✤ MPX, which was designed for retrofitted theatres.

All IMAX projectors, except the standard GT system, could project 3D images onto screens.

In July 2008, the company introduced a digital projection system, which it has not given a distinct name or brand, designed for multiplex theatres with screens no wider than 21.3 m (70 ft).

 ²⁸ "History of IMAX in Timeline" https://populartimelines.com/timeline/IMAX
³⁰ "Imax" (http://www.imax.com/).



Fig. 2-40 Depiction of Video aspect ratios common in film. The Digital Cinema Packages (DCP) have resolution setting and aspect ratio that need to conform with the distribution standard. With cinema, this is typically a 4096x1716 ("scope" or 2.39:1), 3996x2160 ("flat" or 1.85:1) and 4096x2160 ("full container").

Source: https://www.red.com/red-101/video-aspect-ratios



Fig. 2-41 Depiction of BARCO company logo. Source: https://www.brandsoftheworld.com/logo/barco

2.4.4.4 IMAX in the 21st Century (2008-2016)

Because 70mm film and projectors are costly and difficult to mass produce, and because the size of auditoriums that house full-size IMAX screens make them expensive to construct, IMAX debuted a digital projection system in 2008 to use with shorter 1.90:1 aspect ratio screens. It uses two 2K- resolution projectors that can present either 2D or 3D content in DCI or IMAX Digital Format (IDF) which in itself is a superset of DCI. The digital installations have caused some controversy, as many theatres have branded their screens as IMAX after merely retrofitting standard auditoriums with IMAX digital projectors. The screen sizes in these auditoriums are much smaller than those in the purpose-built auditoriums of the original 15/70 IMAX format, and are limited to the 1.90:1 aspect ratio. Another disadvantage is the much lower resolution of digital IMAX. The technology has a maximum perceived resolution of 2.9K, compared to traditional IMAX 70mm projection, which has a resolution of 12K. This is against many non-IMAX theatres projecting films at 4K resolution through rival brands such as Dolby Cinema and UltraAVX.³⁰

IDF initially used 2K- resolution Christie xenon projectors, with a Texas Instruments Digital Light Processing (DLP) engine, but in 2012 IMAX announced that they would be switching to BARCO as their primary supplier.³⁰ This is for digital projector provision in all IMAX theatres from 2012.

Switching to digital projection, from July 2008, came at a steep cost in image quality, with 2K projectors having roughly an order of magnitude less resolution therefore maintaining the same 7-story giant screen size would only make this loss more noticeable. Again, many new theatres were being built with significantly smaller screen sizes, yet being marketed with the same brand name of "IMAX". These newer theatres were soon dubbed by the derogatory name "LieMAX", particularly because the company did not make this major distinction clear to the public, going so far as to build the smallest "IMAX" screen having 10 times less area than the largest while persisting with the exact same brand name.

In April 2012, IMAX began testing a new 4K laser projection system, based on patents licensed from Eastman Kodak. Like the 3D film and digital systems, it used two projectors, but it improved over the smaller digital screens by retaining the traditional IMAX aspect ratio.

³⁰ "Imax" (http://www.imax.com/).



Fig. 2-42 Depiction of an IMAX home cinema completed by London based integration company Cornflake in 2017. Source: https://www.h3-digital.com/smarthomeblog/2017/12/4/first-imax-home-cinema-in-europe



Fig. 2-43 Depiction of the largest screen in the USA at AMC Lincoln Square IMAX in New York City.

Source: https://lfexaminer.com/2008/10/is-imax-the-next-new-coke/

In December 2014, IMAX began rolling out its new Dual 4K laser projector system, dubbed "IMAX with Laser", with the first installation occurring at the Cineplex ScotiaBank Theatre in Toronto. The system allows digital projection on the full 1.43:1 aspect ratio surface of a traditional IMAX screen, but can also be used on wider screens such as the 1.90:1-aspect-ratio.

2.4.4.5 Current IMAX Theatres

IMAX's initial introduction to the public was targeted at a fairly niche set of venues. Purpose-built theatres were designed and placed in museums, science centres and some iconic commercial destinations. The first permanent IMAX projection system was installed at Ontario Place's Cinesphere in Toronto in 1971, where it remains in operation till today.²⁸

In 2008, IMAX extended their brand into traditional theatres with the Digital IMAX, a lowercost system that uses two 2K digital projectors to project on a 1.90:1 aspect ratio screen. This lower-cost option, which allowed for the conversion of existing multiplex theatre auditoriums, helped IMAX to grow from 299 screens worldwide at the end of 2007 to over 1,000 screens by the end of 2015. As of September 2017, there were 1,302 IMAX theatres located in 75 countries, of which 1,203 were in commercial multiplexes.²⁹

IMAX theatres are either "Classic Design"/purpose-built structures, or "Multiplex Design" /retrofitted auditoriums. Classic design differs significantly from conventional theatres and lets the audience be much closer to the screen. Typically all rows are within one screen height - conventional theatre seating runs 8 to 12-screen heights. Also, the rows of seats are set at a steep angle, up to 30° in some domed theatres so that the audience is facing the screen directly.

A standard IMAX screen is 22 m × 16.1 m (72 ft × 53 ft), but can be significantly larger. The world's largest IMAX screen was in Darling Harbour, Sydney, Australia, and measured 35.72 m × 29.57 m (117.2 ft × 97.0 ft). As the theatre in Sydney closed for renovations in 2016 and is due to reopen late 2020, the current largest operating IMAX screen is in Melbourne, Australia and measures 32 m × 23 m (105 ft × 75 ft). The Sydney IMAX reconstruction includes a larger screen ensuring it retains the record as the largest IMAX screen.²⁹

²⁸ "History of IMAX in Timeline" https://populartimelines.com/timeline/IMAX
²⁹ "The History of IMAX " https://www.imax.com.au/news/2013/02/the-history-of-imax/



Fig. 2-44 Depiction of IMAX VR headset for whole immersive experience.

Source: https://www.techwelike.com/tag/amc-theaters/



Fig. 2-45 Depiction of a Virtual reality motion picture experience inside a theatre in Amsterdam.

Source: https://headjack.io/blog/cinema-control-multiple-vr-devices/

2.4.4.6 IMAX & Virtual Reality (2016-onwards)

On September 2, 2016, IMAX announced plans to include virtual reality (VR) into the IMAX theatre experience with the opening of a new VR centre in Los Angeles that would use a new StarVR headset created by Acer. The VR experience was intended for short but interactive videos. IMAX opened a total of seven IMAX VR centres and established a US\$50 million fund for the creation of VR content, as well as partnering with Google for the production of IMAX VR cameras. However, as of December 2018, four out of the seven IMAX VR centres have closed and the remaining three are slated to close in late 2019. As of today, IMAX has expanded all over the globe. Its new digital projection and sound systems combined with a growing blockbuster film slate are fuelling the rapid expansion of the IMAX network in established markets like North America, Western Europe and East Asia as well as emerging markets such as Africa and the rest of Asia.

2.4.5 Virtual Reality & Augmented Reality 2.4.5.1 Origins

Since the Lumiere brothers shot and showed the first film in Paris in 1895, cinema has allowed man to be "transported" back in time and to even "explore" unknown planets. In the recent years, technological innovation has meant cinemagoers have become even more immersed in the stories they see on screen. The development of virtual reality and augmented reality has given film-makers a range of revolutionary VR/AR tools to help craft their movies for the audience at large.³¹

Today's digitally savvy consumers want more and so the film industry both production and exhibition has been pushed to better the experience. This is where VR comes into play. We're already seeing huge changes to consumer technology as a result of affordable VR headsets such as Oculus Rift and the Samsung Gear VR. While originally designed for the gaming community, they represent a quantum shift in technology that's already changing expectations and experiences of going to the cinema.³²

³² https://www.techradar.com/news/vr-films-the-future-of-cinema

³¹ https://www.theguardian.com/culture-professionals-network/2015/jan/30/all



Fig. 2-46 Depiction of Korean patrons enjoying the VR motion picture experience inside a VR theatre.

Source: https://variety.com/2018/biz/news/vr-virtual-reality-gina-kim-1202801584-1202801584/



Fig. 2-47 Depiction of a patron using a pod in the VR video exhibition studio in Beijing, China. Source: http://www.chinadaily.com.cn/a/201904/04/WS5ca5b863a3104842260 b47ca.html Various professionals for example; marketers, broadcasters, engineers, artists and architects are already on to Virtual Reality and the new frontiers it has provided. The question being contemplated by film industry is whether the VR revolution will catch the imagination of the public especially in film exhibition.

While the big Hollywood studios will still primarily decide what the public gets to watch, a handful of First World tech companies are among those developing VR options.

Whether we'll see a return to the often ridiculed 4D effects wind, rain, vibration and so on is another question that's likely to remain unanswered in the near future. Will consumers want wind and water blown in their faces on a typical trip to the cinema or will these extras remain a novelty reserved for science centres and theme parks? This is a big question in VR.

High-resolution headsets at affordable prices represent a real chance for cinemas to benefit from and monetise recent advancements before VR becomes a household product. Looking even further ahead, a Virtual Reality premium experience complete with lifelike HD resolution, haptic that is touch/feel feedback, 4D effects and comfortable swivelling chairs could be something forward-thinking cinemas invest in.³²

Instead of going into a theatre and watching a movie on a huge projection screen, the next movie experience could be one with a VR headset strapped to one's face. In all, this is some incredible, transformative technology incorporated into entertainment. How long this will take to reach consumers on a large scale is the key question.³²

2.4.5.2 VR Theatres

In 2015, Samhoud Media experimented with what it calls the VR Cinema, using pop-up theatres around Europe. The company announced its first permanent VR Cinema theatre in Amsterdam, Germany. More permanent VR Cinemas were expected to open in other cities like London, Paris, Berlin and Madrid later in that year to propagate the new motion picture experience.

³¹ https://www.theguardian.com/culture-professionals-network/2015/jan/30/all

³² https://www.techradar.com/news/vr-films-the-future-of-cinema



Fig. 2-48 Depiction of a VR cinema ,providing a 360-degree rotating chair equipped with a built-in VR headset to enable a comfortable viewing experience. Source: https://vrroom.buzz/vr-news/business/location-based-vrs-resurgence-china



Fig. 2-49 Depiction of a VR 4dmax 360°spinning chair made of strong fiberglass material. Source: http://www.yd4dmax.com/case/2.o-versions-5dof-360sping-vr-chiar-coming.html

Unlike a traditional theatre, the VR Cinema doesn't have a screen with seats facing it; instead, patrons sit in swivel chairs and put on a VR Head Gear and a pair of headphones. Viewers can turn freely in their chairs to see the VR movie in 360 degrees from the comfort of their seats. The VR content accessible to patrons is more a package of videos that last about 25- 35 minutes in total. Across Europe viewers get to experience this at an average pay of $\epsilon_{12.50}$ which is about US\$14 for a ticket. These VR video clips are basically designed to demonstrate how immersive VR can be.³²

2.4.5.3 VR/AR integration into cinema

Unfortunately, not every VR film venture has achieved success. IMAX launched several VR theatres in major US cities in 2017 in partnership with Google. As of late 2018, IMAX shut down two VR theatres and Google halted its partnership to focus on Augmented Reality instead. Disney's VR another major player also chose to pivot to Augmented Reality. Facebook also shut down its VR wing Oculus Story Studio, though the team then formed their studio named, Fable.³²

Overall, VR in films thus far has been one of hype, optimism and sometimes, financial roadblocks. VR has an undeniable future in film but the question is whether VR will follow the path of 3D films where there's an explosive rise followed by a gentle loss of relevance or will it become the go-to film experience in the years to come.

2.4.5.4 Challenges in VR/AR

There are challenges of filming with the intent of exhibiting in VR in that one has to re-envision cinematography, determining which camera techniques like zooms or jump cuts could work without disorienting or nauseating the viewer. Additionally, since there's no "behind" in a VR camera, the film-maker has to direct the actors from a distance and that unlike in 2D or 3D formats one cannot edit footage to hide an actor's bad take. The production crew has to segment the film sets so that if the audience's eyes wander from the main action, they could only look at a select few locations in the 360 degree view. VR film-making provides an opportunity for discovery of a new cinematic technique in a new film-making medium.³²

Another challenge is that filming high-quality VR movies can come with a significant price tag. ³³

³³ https://www.springwise.com/worlds-first-virtual-reality-cinema-opened-amsterdam/

³² https://www.techradar.com/news/vr-films-the-future-of-cinema



Fig. 2-50 Depiction of GoPro's virtual reality camera rig in early 2016. Source: https://www.theverge.com/2016/4/7/11383668/gopro-omnivirtual-reality-video-rig-nab



Fig. 2-51 Depiction of the Virtual Reality Companies Landscape. Source: https://medium.com/@VentureScanner/introducing-the-virtual-reality-startup-landscape-b113452b5f5c

Beyond the usual costs of making a movie, hiring production staff and actors, post-production effects among other production costs one has to buy specialized 360- degree cameras and hire the skilled staff making the film cost upwards of "US\$10,000 per finished minute" of footage, according to the Hollywood Reporter . With that much money going to tech costs, it's more difficult for filmmakers to afford the talented actors that could bring VR further into the mainstream.³³ It remains true that VR films tend to be shorter and more expensive to make than ordinary films. This makes it harder to charge consumers for them as people will be willing to pay US\$20 to watch a two-hour film but will be apprehensive about paying US\$5 for a 10-minute VR experience.³³

VR films also lack the reliable continued revenue streams that 2D & 3D films rely on to make a profit. Hollywood studios first release films in theatres, after which they rake in money from Blu-Ray sales and then from licensing their films to subscription services like Netflix, Amazon Prime or HBO. Subscription services for VR film content are relatively scarce thus far and mostly tend to focus on VR games instead. VR theatres are still a new and limited enterprise when compared to the non-VR theatres around the globe.

2.4.5.5 How VR/AR could grow and change Films

It is advised that no one should actually be sitting for 70 minutes straight inside of a headset. The Oculus Company recommends that one should take a 10 to 15 minute break for every 30 minutes of VR but this harks back to the era of intermissions in film. So aside from bringing back movie intermissions, the challenge is how filmmakers will make VR films and VR experiences that people will buy and enjoy for hours at a time.³²

As headsets improve in graphics quality, frame rates and physical comfort, longer VR sessions will be less prone to eye strain and nausea and lastly, the more people who choose to buy VR headsets, the more likely that the VR platform will be profitable enough and attractive enough to venture into.³³ It's difficult to predict how VR films and technology will grow in the next few years and how VR companies will find a way to profit off of them and pay back their investors but the technology will have a significant impact on cinema's future.

³² https://www.techradar.com/news/vr-films-the-future-of-cinema

³³ https://www.springwise.com/worlds-first-virtual-reality-cinema-opened-amsterdam/



Fig. 2-52 Depiction of the 20th Century Plaza Building along Mama Ngina street which is one of the pioneer theatres in Kenya. Source: https://www.pinterest.com/pin/350999364691879385/

2.5 Evolution of Motion Picture Experience & Theatres in Kenya 2.5.1 Origins

Kenya's scenic beauty was noted as an ideal film location from 1911 after the former US President Roosevelt documentary in Africa was shown in London and Washington. Kenya was seen as a suitable location for "Hollywood in Africa" films from then up to the late 1940s. The Colonial government policy of Kenya as a destination for adventure films from 1920s to late 1940s continued and wildlife documentaries were the order of the day.

Bantu Educational Kinema Experiment (BEKE) was also established as a pedagogical tool and free cinema was taken round the countryside in mobile vans in the 1930s giving basic training through films in farming, hygiene and how to be better servants of the white man.³⁴

Kenyan movies shot on celluloid between 1909 to 1960s are an invaluable asset of our cultural history. Films shot in the earlier years are now not accessible because 16mm and 35mm projectors are no longer easily available locally this is according to Department of Film Services of the Ministry of Sports, Culture and the Arts.

2.5.2 19505 - 19705

The national uprising against colonialism in the 1950s led to the shooting of propaganda films in Kenya aimed at quelling the uprising.³⁴ The independent Kenya government in the 1960s failed to establish a film industry and denied a multiracial group that wanted to produce Mau Mau films a license in 1968.

In 1966, a Documentary Films Unit was created under the Ministry of Information and Tourism and the Kenya Film Corporation was created in 1967 to distribute imported films in Kenyan cinemas. The establishment of the Kenya Film Corporation, the first of its kind in sub-Saharan Africa also created some film consciousness so that by the 1980s despite the challenges it encountered against Motion Picture Export Association of America while trying to wrench film distribution control in Kenya from their stranglehold, the Kenyan society was ready for and expecting local productions.³⁴

³⁴ Nyutho, N. E. (2015) Evaluation Of Kenyan Film Industry: Historical Perspective. Doctor of Philosophy Thesis: School of Journalism and Mass Communication, University of Nairobi.



Fig. 2-53 Depiction of Shan Cinema along Ngara Road, Nairobi during the 1960s, a vibrant spot for Kenyans primarily of Indian descent. Source: http://www.sikh-

heritage.co.uk/heritage/sikhhert%20EAfrica/nostalgic%20EAfrica%20NAI ROBI.html



Fig. 2-54 Depiction of Odeon Cinema Nairobi at the junction of Latema Rd and Tom Mboya St. in mid 1950s.

Source: https://traveldiarieskenya.wordpress.com/2014/10/03/a-lookat-kenya-through-the-years-pictureblog-1914-1990s/#jp-carousel-983 According to Saks (2011), "the idea of moviemaking was strongly linked to the identity of a nation and when countries were inventing and using motion pictures, they needed an image of themselves." ³⁶ Kenya had a clearly marketable story of the Mau Mau forest fight against the British which was a launching platform for Kenyan cinema but the government of the day did not like it for undisclosed reasons. Would cinema stories be structured along the colonial conflict between black and white, the colonizer and the colonized or would Kenya cinema follow Jomo Kenyatta's idea of forgetting the past? What national image would Kenyan cinema cultivate if Mau Mau the most topical story wasn't good enough? Sadly, most of the ambitious projects were killed I their infancy.

By the time Kenya became independent in 1963, there were no Africans of Kenyan origin involved in the film production or distribution industry. The entire local cinema scene was dominated by mostly English language and Hindi films and the production and exhibition staff came from the two communities. Most of the films shown in East Africa were in English and one of the main Indian languages.³⁵ According to Gachathi P.J (1968), only a paltry 30% of Africans in Kenya and Tanzania were attending theatres to watch films. The main cinema goers were Asians and Europeans who comprised 70% of the market. It was hoped however that with spread of education and a growing economy, more Africans in the region would take up the cinema going culture especially to offset the large number of Asians who were migrating away from East Africa to Europe and North America.

2.5.3 1980s

2.5.3.1 Local productions

Mlevi, was the first local film was produced in 1968 by Ragbir Singh but in the 1980s, local productions increased with local movies like Bush Trackers, Rise and Fall of Idi Amin and Kolormask. Kolormask was the first government funded movie but it was a disappointing box office flop and ever since then the government didn't produce any other movies. Out of Africa (1985) a film swept the awards at the Oscars and gave Kenya great publicity internationally.³⁵

³⁵ Nyoike Njoroge(1985), General Manager Kenya Film Corporation in Wanjiru Ciira's article 'Is Kenya Ready to Go into Film Production,' Life and Leisure, Weekly Review p.13 September 1985

³⁶ Saks Lucia (2011), University of Cape Town/University of Michigan, A Tale of Two Nations: South Africa, De Voortrekkers and Come See the Bioscope, https://www.google.com/?gws_rd=ssl#q=De+Voortrekkers.



Fig. 2-55 Depiction of Cameo Cinema, Nairobi, 1973. Initially, named Theatre Royal till it was turned into a cinema in 1964. It was the only cinema hall in East Africa with the twin Zeiss Ikon projectors. Source: https://globaleastafrica.org/about



Fig. 2-56 Depiction of Belle-Vue drive in along Mombasa Road, meeting place for Kenyans of Asian descent over the weekends in the 70s. Source: http://www.sikh-

heritage.co.uk/heritage/sikhhert%20EAfrica/nostalgic%20EAfrica%20NAI ROBI.html

2.5.3.2 Technology

Kenya Institute of Mass Communication school was launched in 1975 to train technicians locally. The facilities opted for 16mm celluloid format for film distribution purposes, in schools, social centres and open air circuits. Most cinema owners preferred 35mm film at the time because they had invested heavily in the facilities but due to the diminishing cinema audiences in Europe and America, theatre owners started partitioning their 35mm film cinema houses to smaller theatres with 16mm film screens, sitting smaller audiences.

The 35mm single screen operation costs had become prohibitive and It had become more cost effective to run two or three 16mm films at the same time instead of a one 35mm film. Additionally, the 16mm prints cost a lot less and so did their projection equipment. This was during the proliferation of Multiplexes in the First world countries.

According to Rossen (2013), despite Hollywood's anxiety over the VHS & VCR technology, box office revenue rose from \$2.7 billion in 1980 to over \$5 billion in 1990, an increase of over16%. Years later, DVDs the successors to videocassettes would account for roughly 50 % of studios' overall profits.³⁷ All the fears from the VHS and VCR technology proved unfounded in the long run. In Kenya, the scare of the video cassette was equally dramatic with cinema owners launching a major advertising campaign to combat the onslaught.

According to Kaleb Njama (1985) cinema owners would buy a full page in the newspapers extolling the virtues of cinema. They also invented gimmicks to launch and sell new movies. Before Breakdance got a premier in Nairobi, a breakdancing competition was staged outside Kenya cinema where the film would be shown. For the show of Woman in Red, 20th Century Fox gave free tickets to all women dressed in red. And for a Passage to India, a free ticket to Bombay was offered to a lucky viewer.³⁸

2.5.3.3 Local Cinemas

There was a demand during the '70s from Globe, Liberty, Tivoli, and Vedesh cinemas which claimed they were trading at a loss after they started using the Kenya Film Corporation films.

³⁷ Rossen Jake (2013), How Hollywood Can Capitalize on Piracy, http://www.technologyreview.com/review/ 520336/how-hollywood-can-capitalize-onpiracy/



Fig. 2-57 Depiction of Fox Drive-In Cinema on Thika Road near Ruaraka Breweries.

Source: http://www.sikh-heritage.co.uk/heritage/sikhhert%20E Africa/nostalgic%20EAfrica%20nAIROBI.html



Fig. 2-58 Poster advertising a TV/film pitch competition in Nairobi. Source: http://kenyafilmcommission.com/index.php/whats-new-article The company Veljee Devshi & Bakrania that operated the Globe cinema for instance sought an indemnity to protect themselves and deemed the closure of the cinema an economic necessity. ³⁸ The cinema closures of the 1970s-1980s by their non-African owners was intended to blackmail the government but ended up a complete failure. All the cinemas that had closed down reopened except for the three owned by the 20th Century Fox that is Twentieth Century, Kenya Cinema and Fox Drive-In. They all were ready finally to receive their supplies from the Kenya Film Corporation which they had rebelled against for years.

The local cinema owners petitioned government to legislate on the use of VCR & VHS in an effort to stem its spread and the damage it was inflicting to cinema attendance. In Nairobi for instance, Globe Cinema was forced to close down while the Belle-Vue Drive-in followed while in Mombasa, the Naaz Cinema and the only drive-in closed down.

2.5.4 1990s - 2000s 2.5.4.1 Local productions

Local productions started picking up with the downfall of the one-party state regime in the 1990s. Saikati by Anne Mungai was one of the local productions released in 1992. In the 1994, South Africa apartheid ended and it started competing with Kenya on the continental scale. After 2000, movies such as From a Whisper (2008) started making a mark. In 2012, Nairobi Half Life, the controversial but most successful Kenyan film was released and got Oscar selection but ultimately didn't get nomination.³⁴

Advancements came with democracy such as establishment of the Kenya Film Censorship board in 2001, the Nairobi Cine week under French Cultural centre in 2003, the Kenya Film Commission started in 2006 together with the Kenya Film Classification board. Awards for the industry for instance, the Kalasha Awards to professionalize film locally were initiated by Kenya Film Commission in 2009. The Department of Film Services was moved to the Ministry of Sports, Culture and the Arts in 2013 with the realization that film is a tool of culture and not information.

³⁸ Njama, Kaleb (1985)'How Serious is the Video Cassette Threat?' Life and Leisure, Weekly Review, Sep 1985.
³⁴ Nyutho, N. E. (2015) Evaluation Of Kenyan Film Industry: Historical Perspective. Doctor of Philosophy Thesis: School of Journalism and Mass Communication, University of Nairobi.



Fig. 2-59 Depiction of the Kenyan film, Nairobi Half Life shot in Nairobi. Source: ihttps://www.imdb.com/title/tt2234428/



Fig. 2-60 Depiction of Kenya Cinema along Moi Avenue during 1970s. Source: https://petegoddard.pw/1976-1977-gap-year

The Kenya Schools and Colleges Film Festival launched in 2012 and it has had a remarkable growth since then with its establishment boosting film productions & exhibitions in all of Kenya.

2.5.4.2 Technology

In the mid-1980s, video technology entered the local market and VHS movies became very popular. Cinema attendance numbers dropped heavily and several cinema theatres closed down and some converted to churches.

From early 1990s, local Video production established itself on River Road in Nairobi without any formal structures. Nairobi's River Road using VHS equipment adopted the name Riverwood as their brand name in the early 1990s. Most of the early operatives in River Road started the business after failing to secure formal employment and started hawking music audio CDs dubbed for mass distribution. These youth started music piracy using video and eventually they started putting vernacular voice-overs on popular Kung-fu films to make films accessible to audiences who could not understand English. This developed into shooting local vernacular stories which helped to establish the River Road located industry.³⁴

The industry dubbed "Riverwood" developed an innovative approach in coping with technological and social-political changes that led to the emergence of a local film industry based on video and later digital devices. The growth and popularity of the Riverwood film industry attracted formally trained producers and a gradual improvement of the quality of Riverwood products. The spread went beyond River Road to all over the city and beyond into the urban centres of the 1990s Kenya.

2.5.4.3 Make-shift Theatres and the decline of Cinemas

Many cinema houses across the Kenyan cities closed down from the mid-1980s to the 1990s due to a weakening Kenya economy, corrupt governance and digital convergence among other reasons. This led to the growth of film rooms in the urban and peri-urban centres of the country where patrons could watch films on VHS and TVs for a small price.

³⁴ Nyutho, N. E. (2015) Evaluation Of Kenyan Film Industry: Historical Perspective. Doctor of Philosophy Thesis: School of Journalism and Mass Communication, University of Nairobi.



Fig. 2-61 Depiction of local makeshift motion picture theatres dubbed video shows during the late 1990s and early 2000s. Source: yukihirotaguchi.wordpress.com



Fig. 2-62 Depiction of local makeshift motion picture theatres dubbed video shows during the late 1990s and early 2000s. Source: yukihirotaguchi.wordpress.com

Hollywood action movies and Hong Kong action movies which were very popular with the young audiences in these makeshift theatres had deejay commentators in Kiswahili to translate the dialogue and make it available to the audiences who could not follow it in English. This concept of live commentary was similar to the commentaries of the silent cinema era (1890s - 1930s).

During this era, the locals had the freedom to inject their vernacular languages into the story. The innovative silencing of the original soundtrack and replacing it with local languages gave film attendance a new impetus. This created the foundation to the rise of the "Riverwood" film business. The progressive slump of the Kenyan economy in the 1980s and 1990s due to the mismanagement imposed by a corrupt political regime led to the closure of several cinema houses as the dwindling middle class couldn't sustain the lifestyles. This led to the springing up of informal video film theatres in the slums, the estates and shopping centres in the main towns.

According to a study by Kimani et al (2014), "The Kenyan film scene experienced a descending trajectory characterized by dwindling fortunes in cinema theatres, leading to closure of famed theatres like Odeon cinema, Nairobi cinema, Fox drive-in cinemas and Globe cinema, among others, in Nairobi and other major towns in Kenya. As the cinemas auditoriums were succumbing to the culture of indifference to theatre-going in the 1990s, estate and village video shows proliferated in the densely populated low-income urban and peri-urban areas in Kenya." ³⁹

Looking back on the happenings of the 1980-90s, it becomes understandable how the film industry could not thrive because the political environment was hostile to all manner of creative expression. A film culture cannot be established easily under a dictatorial culture because, "Film makers have the power to communicate with masses and the lack of the democratic space killed the creative drive that had started in the 60s and 70s." The government killed the artistic and the creative spirit during President Daniel Moi's 24 year regime which stifled the beginning of the motion picture industry in the country from its production phases to its exhibition phase.

³⁹ Kimani, G., & Mugubi, J. (2014). The Sociolingual Disposition of the Emergent Deejay Afro Film Commentary in Kenya, International Journal of Art and Art History Vol. 2, No. 1; March 2014, American Research Institute for Policy Development www.aripd.org/ijaah



Fig. 2-63 Depiction of current Motion Picture theatre chains logos within the Nairobi county. Source: https://www.facebook.com/PlanetMediaCinemas/



Fig. 2-64 Depiction of current Motion Picture theatre chains logos within the Nairobi county. Source: https://anga.today/



Fig. 2-65 Depiction of current Motion Picture theatre chains logos within the Nairobi county. Source: https://business.facebook.com/pg/centuryimax/posts/

2.5.5 20105

Kenya's motion picture theatre industry has grown over the years from the era of Cameo which was replaced by more sophisticated 20th Century, Nairobi Cinema, Kenya Cinema, Shan Cinema, Odeon and Liberty cinemas. Over the last ten years, new cinema houses have opened up fuelled by a young trendy middle class who have a disposable income to spend on entertainment. Even though the trend has been consumption of movies more on the digital handsets such as smart phones and tablets, cinema is fighting back to keep audiences.

The global scene has permeated into the local scene with theatre chains like Planetmedia Cinemas, ANGA Cinemas and Century Cinemax theatres and the cinema experience from these new theatres can't be found anywhere else locally. The digital era creates innovations every day and there are many efforts being made to stimulate all the senses in the cinema.

2.6 Conceptual Framework

The conceptual framework represents the author's synthesis of literature reviewed in this chapter with regards to the general direction into which motion picture is developing, changing and veering toward. Motion picture has seen an influx of new concepts in sound and visuals over time that has been brought by the changing technology. Noise control is also a vital issue in the making of good auditoria for Motion Picture. This includes both sound from inside the theatre and sound from the environment outside the theatre.

A lot of variables inherent in motion picture in general, influence the Motion picture spaces and the end user experience. Some of the variables identified that affect the experience and the spaces include: accessibility, cost, convenience, utility, flexibility, visual appeal, acoustics, speed of service, security, reliability, ergonomics and human factors.



Fig. 2-66 Depiction of parameters considered in the analysis of Geometry, Layout and general planning of examined Fieldwork local cases within the Nairobi county. Source: Author



Fig. 2-67 Depiction of parameters considered in the analysis of Building technology and material finishes of examined Fieldwork local cases within the Nairobi county. Source: Author



Fig. 2-68 Depiction of parameters considered in the analysis of Technology of examined Fieldwork local cases within the Nairobi county. Source: Author



Fig. 2-69 Depiction of parameters considered in the analysis of Ergonomics of examined Fieldwork local cases within the Nairobi county. Source: Author

2.6.1 Geometry, Layout & Planning

This included the spatial layout and arrangement of spaces upon entry into the complex, number and capacities of the cinema halls in the complex, hall geometry in terms of shape & various dimensions, existing service & support spaces in the complex and the accessibility/circulation channels provided within the spaces.

2.6.2 Building Technology

This included the structure, surface articulation, materials and finishes employed in the facility and its spaces. This was reviewed in terms of floors, walls and ceiling structure & finishes.

2.6.3 Technology

Adapting new technology systems to make motion picture spaces convenient, efficient and safer to the user is very important in this modern age. The world we live in currently is mostly driven by technological forces and with this current generation, technology has been adapted quite fast because of its efficiency, ease and comfortability. This section delves into the technological advancements employed in the construction, finishing and user experience of the motion picture space.

2.6.4 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal acoustic environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.



RESEARCH METHODOLOGY

Cinema is universal, beyond flags and borders and

passports,

Alejandro Gonzalez Inaritta

3.1 Introduction

This chapter will focus on the methods of research that will be employed to carry out the study. The chapter will provide information on the techniques that will be used to investigate the case studies in order to answer the research questions and to achieve the objectives of the study. The research purpose, research strategy and the data collection methods will be elaborated so as to put the case study approach into perspective. Finally, the data presentation methods and the time horizon for the research will be stated.

3.2 Research Purpose

This is a descriptive research that aims to establish the state of some of the Motion picture spaces and theatres in Nairobi and how the selected case studies have tried to enhance the quality of the spaces. Founded on the literature review in the second chapter this study will seek to examine five local Motion picture spaces comparatively to establish what Nairobi offers locally. As mentioned above, the study takes a descriptive approach in order to give an accurate profile of the selected cases in Nairobi County.

The objectives of the study as stated in chapter one are as follows:-

- ◆ To explore the emerging trends in motion picture experience and theatres in Nairobi.
- To analyse the impact of these trends on the spatial arrangement and planning of motion picture theatres in Nairobi.
- To derive lessons and give recommendations that can be learnt in the design of motion picture theatres for enhanced user experience in the modern era within Nairobi.

3.2.1 Research framework

This is a summary of how the research study has been carried out.

Research Objectives	Data needed	Dimensions	Sources	Research tools
To explore the emerging trends in motion picture experience and theatres in Nairobi.	What are the emerging trends in motion picture experience and theatres?	Historical analysis Conceptual analysis	Secondary data: past thesis, periodicals, articles, journals, internet, books, archives. Primary data: interviews, observations, observational sketches, photographs	Literature review observations, interviews, review of architectural drawings
To analyse the impact of	How have the trends	User's perception	Secondary data: past	Literature review,
these trends on the spatial	impacted the spatial	Sensorial aspects	thesis, periodicals,	observations, interviews,
arrangement and planning	arrangement and		articles, journals,	review of architectural
of motion picture theatres	planning of motion		internet, books,	drawings
in Nairobi.	picture theatres?		archives.	
			Primary data: interviews,	
			observations, photographs	

To derive lessons that can be learnt and give recommendations in the design of motion picture theatres in the modern era	What are the lessons learnt in designing the 21 st century motion picture theatre?	Conclusion of the analysis based on objective one and two	Primary data: Conclusions drawn Secondary data: Reviewed literature	Recommendations from research, Review of appropriate literature
within Nairobi				

3.3 Research Strategy

The subject matter will be investigated using the case study method. The parameters established after the literature review are qualitative parameters. The qualitative parameters to be investigated include: - spatial layout, hall geometry and capacity, service spaces, accessibility, building technology, technology, ergonomics & sensorial factors.

3.3.1 Sampling method

Non-probabilistic sampling was adopted as the sampling method for this study as this method is mainly applied by researchers to find out how a small group or a representative group is doing for purposes of explanation. In this case, a few selected motion picture spaces with the most recent features and those with high levels of patron attendance were selected to represent all the Motion picture spaces and experience for the larger Nairobi County. Five local case studies in the County were analysed in the study. The selection of samples was based on their location within Nairobi, accessibility to the author, recentness of design, level of technological advancement advertised, availability of relevant information & documentation of case studies, quality of the variables and subjective judgement of the researcher as opposed to random selection.

The case studies selected are:

- Century Cinemax Garden City
- Century Cinemax Junction
- ANGA IMAX CBD
- ✤ ANGA DIAMOND Parklands
- ANGA SKY Panari, Mombasa Road

3.3.2 Attributes & Parameters

The following general attributes & parameters were investigated for each of the selected case studies:-

3.3.2.1 Geometry, Layout & Planning

This included the spatial layout and arrangement of spaces upon entry into the complex, number and capacities of the cinema halls in the complex, hall geometry in terms of shape & various dimensions, existing service & support spaces in the complex and the accessibility/circulation channels provided. **3.3.2.2 Building Technology**

This included the structure, surface articulation, materials and finishes employed in the facility and the spaces therein. This was reviewed in terms of floors, walls and ceiling structure & finishes.

3.3.2.3 Technology

Adapting new technology systems to make motion picture spaces convenient, efficient and safer to the user is very important in this modern age. This section delves into the technological advancements employed in the user experience of the motion picture space.

3.3.2.4 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal acoustic environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.

3.4 Data Collection

Primary and secondary data will be used to collect information for the parameters mentioned in this study. The research methods that will be used are as follows:-

3.4.1 Observations

Data will be collected through use of sketches, photography and graphical data. Layout plans and sections denoting sound path sketch diagrams will be used during the fieldwork. Pictures of the materials used in the finishes will also be taken.

The primary data collection methods included observations made in the study area through use of sketches, photographs and measured drawings. The major strength of direct observation is that it is unobstructive and does not require direct interaction with participants, observations help put the elements of the study in context and hence understand them better. It also enables first hand documentation of the situation on the ground. Both structured and unstructured observations help capture all other information that wasn't earlier envisioned.

3.4.2 Measurements

Physical measurements will be carried out using a distometer and tape measure. This will include: ceiling heights, floor rakes, widths and lengths. In this research sketches and drawings were given the major role in communication of findings and observation in the course of the fieldwork and analysis. They offered a wide variety and flexibility of presenting the findings of the research.



Fig. 3-1 Depiction of tape measure and laser distometer measurement tools used during fieldwork. Source: Author

3.4.3 Questionnaires

Questionnaires were also administered in the fieldwork for data collection.

3.5 Data Presentation

The data to be collected will be analysed and presented in the following forms: **3.5.1 Figures**

Sketches: - Data will be sketched in the fieldwork and presented as such either as hand sketches or CAD sketches. This will include: spatial & layout plans, sections and perspectives.

Photographs: - Images taken during the study that will be used to showcase information as per the stated time of the study will be used. Digital images were used to give representation of stations on the ground, buildings, building components and other details to illustrate existing conditions and issues to be examined. These were necessary to support the descriptions given in the text.

Graphs: - Graphical data will be presented in graph formats in the findings.

3.5.2 Tables

Measurements regarding the reverberation time will be presented in table format for easier reading.

3.5.3 Descriptive

Since this is an exploratory research, it was necessary to use words to convey some of the findings of the research. The researcher used case descriptions where a detailed analysis of the spatial organizations, the legibility and the permeability, visual and sensorial was carried out.

<u>3.6 Time Horizon</u>

The fieldwork study was carried out between 22nd July to 11th October 2019.

This is a cross-sectional study, carried out over a 4 month period, from July 2019 to October 2019, studying the trends used in the relatively new cinema spaces and their influence on patrons guided by the chosen case studies. A study was undertaken in which data was gathered over a period of weeks from the selected theatres, their users and their management in order to answer the research questions.



FIELDWORK FINDINGS & ANALYSIS

Cinema should make you forget you are sitting in a theatre.

Roman Polanski

4.1 Introduction

This is a descriptive research that aims to establish how the recent innovations in Motion Picture and their experiential effects have been employed in the selected case studies and how they have affected the motion picture spaces. The cases examined are: - ANGA IMAX theatre, ANGA Sky Panari theatre, ANGA Diamond theatre, Century Cinemax Junction theatre, Century Cinemax Garden City theatre.

With the number of cinemas rising, more movies are being screened simultaneously in Nairobi, affording moviegoers a wider selection at any given time. There is a clear revival in movie entertainment and it is a matter of getting ideal premises in urban towns that have a good population. The industry is experiencing more growth in the 16-30 demographic age bracket, but there's also considerable growth in children's demographic age bracket as well as among the over 40s. A person's behaviours, attitudes and emotions about using a particular product, system or service which in this case is the Motion Picture is what the author has considered to be the experience. The fourth chapter involves the analysis and presentation of data collected and synthesized from the literature review as well as that collected during fieldwork. It starts with a restatement of the research objectives, as a reminder of what the researcher went to study during the fieldwork. The various case studies investigated were selected because of their recent establishment, technological advancement and those with high levels of patron attendance and because of their location within the Nairobi County, which is the area specified within the title of the study.

4.1.1 Research Objectives

- ◆ To explore the emerging trends in motion picture experience and theatres in Nairobi.
- To analyse the impact of these trends on the spatial arrangement and planning of motion picture theatres in Nairobi.
- * To derive lessons that can be used in the design of motion picture theatres for enhanced user experience in the modern era within Nairobi.

It is important to note that experiential architecture cannot be referred to as a scientific study. Therefore, the main method of data collection and presentation was via sketches & photography illustrating the relevant information. When necessary however, drawings and CAD illustrations were included to emphasize the information.

4.2 Case 1: ANGA IMAX Theatre

4.2.1 Location

ANGA IMAX cinema is situated on the 1st floor of the 20th Century Plaza building located in Nairobi CBD, Starehe constituency, longitude 1°17'07.7"S latitude 36°49'22.1"E. The 20th Century Plaza building is located between the Mama Ngina Street and Kaunda Street on L.R No. 209/5409 opposite Trans-National House.



Fig. 4-1 Depiction of ANGA IMAX theatre entrance in the 20th Century Plaza building from Mama Ngina Street Source: google.co.ke/5623



Fig. 4-2 Location & access to the 20th Century Plaza building housing the ANGA IMAX theatre. Source: JICA map: Survey of KENYA, Author modified

4.2.2 Background Information

There had been a growing demand for high quality movie entertainment systems locally with the advent of the new century which prompted the entry of the first IMAX in Kenya in 2012 by Blue Sky World ltd. The Blue Sky World ltd. partnered with IMAX International to bring the first IMAX Theatre to East & Central Africa with an outlet in the Central Business District at 20th Century Plaza. This new IMAX Theatre took up the space previously accommodating Fox 20th Century Cinemas and resulted in the previous two Fox cinemas being combined into one and retrofitted for IMAX standards.

Kenya's first IMAX theatre was opened on March 30, 2012 with the flair and glamour fitted for a Hollywood red carpet event. The launch was dubbed Africa's second IMAX theatre at the time, the only other being in Cairo, Egypt as the other IMAX Cinema in South Africa had been closed due to contractual issues. The cinema was branded ANGA IMAX cinema.

4.2.3 Geometry, Layout & Planning 4.2.3.1 Layout

ANGA IMAX located at 20th Century Plaza building alongside other business ventures in the same building including the Dancing Spoon restaurant, cosmetic shops, a bookstore and a forex bureau among others. The theatre itself is accessed from the central arcade on ground floor in the building that connects Mama Ngina Street and Kaunda Street, this arcade is semi-public in that access is restricted by the building's security service. From the arcade there are two sets of stairs each on opposite ends that lead up to the theatre lobby which is also shared by a restaurant on the same first floor level. The stairs are standard 300mm x 150mm tread and riser with a width of 2100mm separated by a railing in between the stairs at a height of 900mm.

From the lobby, patrons can access the two ticket and snack booths and the washrooms which are demarcated for the two sexes appropriately. There are two entry points into the cinema hall from the lobby which are manned by staff that check the validity of tickets and allow patrons into the hall through a series of stepped corridors that are 900mm wide. One of the entry points leads to a subsidiary Lounge & Bar named Arfa Lounge before entry into the main hall while the other leads directly into the hall and is usually used as the main entry as seen in Fig 4.3.



Fig. 4-3 Spatial disposition of ANGA IMAX theatre lobby. Source: Author

4.2.3.2 Hall geometry/capacity

The theatre has just one cinema hall that is an IMAX hall fully certified by IMAX international. ANGA IMAX has a rectangular shape in floor plan layout with the screen being located on the longer side this provides more number of columns as opposed to rows in the seating arrangement. The rows are arranged tranversally with respect to the screen. The rows are 10 in number and labelled from A to J with row A having 17 seats, row J having 30 seats and the rows in between having 29 seats each. The big auditorium hall is equipped with 279 seats in total with the seats being upholstered. The hall dimensions are 12,800mm depth by 19,800mm length and a height of 9,300mm; this is demonstrated on the sketches provided in figures 4.4 and 4.12.

4.2.3.3 Service spaces

This includes audience amenities that maximize customer experience in the facility. The typical amenities include the lobby, washrooms, ticket and concession stands.

Lobby: - The lobby for ANGA IMAX is about 7,200mm at the widest point by 18,000mm length. This is demonstrated on in fig. 4.3. The lobby has two ticket and concession stands that cater to the patrons. The lobby area doesn't provide seating for patrons as they wait for their screening which is a flaw in the service quality.

Ticket & Concession stand: - The theatre has two stands that serve the patrons. They are both equipped with automated ticketing machines that accept cashless transactions as well as cash transactions with the option of patrons choosing the seats that they want instantaneously. The stands also provide choice of snacks that patrons can buy before and after the screening.

Washrooms: - There are two washrooms accessed from the lobby that serve the patrons and staff on the first floor of the building. The two are delineated for the two sexes with wash hand basins and stalls inside.

4.2.3.4 Accessibility

This includes how people, equipment and supplies move effectively and safely through the building.



Fig. 4-4 Depiction of the floor plan at ANGA IMAX theatre. Source: Author <u>Crowd control</u>: - As movie theatres have grown into multiplexes and megaplexes, crowd control has become a major concern with overcrowding being rather unpleasant and extremely dangerous in emergencies. ANGA IMAX has implemented the crowd control measure known as the ubiquitous holdout line which prevents ticket holders for the next showing of a movie from entering the theatre until their particular auditorium has been cleared out and cleaned. These hold out spaces entice ticket holders to shop or eat while they wait. This has not been effectively realized in ANGA IMAX because the lobby is rather small and has no seats. However, given the fact that rent is based on floor area, the practice of having a smaller lobby is somewhat understandable.

<u>Security & Safety</u>: - Security guards are stationed at the ground floor entry points and serve the entire business ventures in the building as opposed to being responsible solely for the theatre. The theatre has 15 staff members that provide appropriate customer service throughout the facility. Fire safety has been considered inside the lobby with easily visible signage and fire fighting cylinders located visibly.

<u>Universal Access</u>: - ANGA IMAX has not provided access for wheelchairs from the building arcade, the theatre lobby, washrooms and subsequently the cinema hall. There exists stairs and steps that serve only the able bodied patrons and inhibit universal access. The circulation spaces are adequate for movement both inside the hall and outside the hall.

4.2.4 Building Technology

This includes the structure, surface articulation, materials and finishes employed in the facility and the spaces therein.

4.2.4.1 Floors

The ground floor arcade entry is a concrete floor slab finished with 600mm square ceramic floor tiles. The stairs that lead up to the theatre level are also made of concrete and finished in terrazzo. The lobby floor is also finished in terrazzo all the way up to the hall entry/exit points while the washrooms are finished in ceramic floor tiles. The entry/exit corridors are carpeted with metal plate fixes on the steps and this finish is extended into the hall which is also carpeted fully on all floor surfaces.



Fig. 4-5 Depiction of ANGA IMAX theatre Lobby section. Source: Author

4.2.4.2 Walls

The basic structure of the 20th Century Plaza Building is reinforced concrete structure with masonry stone infills. As one approaches from the stairs, one side of the walls is padded with dark coloured carpet while the other is finished with ceramic wall tiles. The lobby walls are all finished in dark coloured carpet to absorb noise with display boards for advertisements hung on the walls. The washrooms are finished in glossy ceramic wall tiles to reflect light and add luminance to the spaces. The entry/exit corridors are padded in red carpet to absorb noise as one approaches the cinema hall. The hall is padded in dark coloured carpet for non-reflectivity on all the four walls that absorb sound to prevent echo.

4.2.4.3 Ceiling

The soffit level at the lobby is finished in painted gypsum boards and bulkheads that have apertures for downlighters with LED strip lighting on the vertices. The soffit provides a double volume inside the lobby. Inside the hall, the structure is made of steel trusses and covered with gypsum acoustic ceiling boards that are dark coloured. The hall ceiling is also innervated with HVAC vents that regulate the internal temperature of the hall.



Adapting new technology systems to make motion picture spaces convenient, efficient and safer to the user is very important in this modern age. The world we live in currently is mostly driven by technological forces and with this current generation, technology has been adapted quite fast because of its efficiency, ease and comfortability. This section delves into the technological advancements employed in the construction, finishing and user experience of the motion picture space in the ANGA IMAX theatre.

4.2.5.1 Screen

The screen at ANGA IMAX theatre auditorium is 17,000mm by 7,300mm shown in fig 4.18, which is slightly over 55 feet wide by 24 feet high and its massive size is the first thing you notice when you first enter the auditorium. The screen has a 2.35:1 aspect ratio that stretches over the front-side wall.



Fig. 4-6 Depiction of floor & wall materials around the lobby space and the steps that limit universal accessibility. Source: Author



Fig. 4-7 Depiction of Recessed Ceiling lights, Ceiling treatment and double volume space in the lobby at ANGA IMAX. Source: Author



Fig. 4-8 Depiction of ARFA bar & lounge at ANGA IMAX theatre. Source: Author modified

The traditional IMAX screen was slightly curved and typically 16,000mm high by 22,000mm wide, approximately 52 by 72 feet which is about six times the size of a traditional movie screen. This discrepancy with the ANGA IMAX screen is because of the development of digital technology which was not there when IMAX technology was developed. Now, almost every movie theatre uses digital projection and in order to stay profitable and keep expanding, IMAX needed to change its business model. The company began focusing less on the giant screen and more on digital technology as they brought IMAX to the masses resulting in smaller screens.

The screen is a silver lenticular screen, made of a vinyl stretched over the structure and painted silver in order to reflect polarised light often used in 3D films and stretched for the whole length and height of the frame to achieve tautness. The ANGA IMAX screen is capable of both 3D and 2D viewing for patrons. The patrons are surcharged an extra fee for renting the 3D glasses provided by the ANGA IMAX management for the whole duration of the film if it's a 3D film. The screen also has hundreds of small, evenly spaced holes to allow air to and from the speakers and subwoofer behind the screen.

4.2.5.2 Sound

The sound system in ANGA IMAX theatre is provided by IMAX where the sound system reads the soundtrack embedded in the video track inside the film onto its own hard disk drive, which is then carefully synced with the video either by computer or within the projector to ensure better picture and better sound. The speakers, both the sub-bass and the full-range systems, are custom designed and manufactured by IMAX.

The theatre utilizes the 'IMAX 6.1 channel' surround sound, with speakers that produce 12,000 watts of ear-pounding sound on all the four wall planes. This is the traditional IMAX format and was designed prior to the advent of multi-channel digital audio systems.

There is a network of a total 44 speakers in the theatre according to the management with some being concealed. The speakers are directional, which allows them to distribute sound more evenly across the theatre, including behind the screens to support a fuller three-dimensional sound effect.



Fig. 4-4a Depiction of 6-Channel surround and speaker placement in the theatre. Source: Author The custom designed speakers have a wider dynamic range than conventional theatrical speakers. The low frequency response goes down to 23 Hz, which gives a deep subwoofer capability and it has also identified low frequency noises in films that were never heard before because the industry's prevalent sound system called THX systems could only go down to 40Hz. The high frequency response is higher to offer a wider dynamic range in sound reproduction.

Most standard cinema theatres are fitted with 8,000 watts, while IMAX theatres have between 12,000 to 15,000 watts sound system. Ordinarily outdoor concerts often use 15,000 watt amplifiers and sound systems, which is comparable to IMAX sound system showings but the latter is in an enclosed space for even better acoustics as shown in fig 4.4a.

4.2.5.3 Lighting

Auditorium lighting design needs to meet two fundamental functions. The first part is the illumination needs of the public who work in and enjoy the space while the more difficult part is to convey the intended feeling and emotion that fits the program and the attitude of the space. A successful design elicits an emotional human connection to the space, and lighting plays a crucial role in accomplishing this goal.

Lighting has been used for general illumination necessary for public safety, way-finding and it also serves a crucial role in creating excitement and eliciting emotion for patrons too.



Fig. 4-10 Depiction of IMAX 6-Channel surround sound configuration in a hall. Source: Author modified

Fig. 4-9 Depiction of Ceiling lights and Ceiling treatment in the lobby. Source: Author



Fig. 4-11 Depiction of ambient lighting and natural lighting in the lobby. Source: Author

4.2.5.4 Projector

The projector technology system in use at ANGA IMAX is the digital projection system which was provided by IMAX international. The system is the Digital Cinema Initiative compliant 2K Xenon projectors that make motion picture experience very immersive. This is a dual projector system featuring dual-2K resolution projection is from the Barco series. This dual projection setup enables the theatre to superimpose the output of both projections onto each other with half a pixel offset resulting in a higher perception of overall resolution and even better contrast.

The projection system at ANGA IMAX uses polarization to create the 3D effect however; it utilizes linear polarization instead of circular polarization. The difference between the two being how the light from the projector is filtered to each individual eye. In order to get the maximum effect of the IMAX 3D imagery, the viewer must keep their 3D glasses on and their head level to avoid bleed-over of the rays from the intended eye to the opposite channel.



Fig. 4-12 Depiction of Theatre Hall section at ANGA IMAX theatre. Source: Author

The theatre was fitted with this digital system in line with IMAX international regulation of making all theatres associated with its brand to switch to digital projection as from Mid-2008.

4.2.6 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal cinema environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.

4.2.6.1 Seating layout

There are two basic types of seating arrangements one can consider for their auditorium: "multiple-aisle" or "continental." Generally, a continental arrangement will allow more seating in any space. The seating layout at ANGA IMAX auditorium is the continental seating layout with an aisle on each end this has allowed for most of the rows to have 29 seats. This arrangement allows for enough space for passage between the rows and the auditorium seats are foldable which eases passage.



Fig. 4-13 Depiction of standard IMAX theatre surround sound speaker placement and screen size. Source: imax.com



Fig. 4-14 Depiction of Theatre Hall section at ANGA IMAX theatre. Source: Author Stadium seating, that is popular in modern multiplexes, is in use in the auditorium hall at ANGA IMAX. This layout actually dates back to the 1920s and features sharply raked rows of seats extending from the screen towards the back. This gives patrons a clear sight line over the heads of those seated in front of them. Intimacy, the shared experience and audience enjoyment are significantly impacted by the relationship of seats not only to the screen, but also to each other. The seats are numbered individually and arranged in rows each seat with armrests that demarcate the seating area. The rows inside the hall are 10 in number and labelled from A to J with row A having 17 seats, row J having 30 seats and the rows in between having 29 seats each. This brings the total number to 279 seats as shown in fig 4.4b.

4.2.6.2 Floor Raking

The Stadium seating has been modified in the auditorium because of the very tall screen. Because of the angle of rake of the seats from the stage all the way to the back row, the aisles have steps. The auditorium hall is steeply raked; the floor to ceiling height from row A being 8,200mm and the floor to ceiling height from row J being 6,000mm. The aisle steps are 150mm high for the risers and 300mm for the treads. The sketch is provided in fig 4.12 depict the findings. The seating is steeply pitched around 11 degrees for half the seats which then increases to about 18 degrees for the latter seats.

4.2.6.3 Sightlines

The step-down between the rear and the front seats is unusually steep approximately 2,200mm but this provides uninhibited sightlines for all patrons from their seats all the way to the screen at the front. The last row at the back of the row is slightly staggered from the immediate row in front of it to further enhance the sightlines. The sketch is provided in fig 4.12 and 4.14 depict the findings.

4.2.6.4 Tactile

The haptic perception is a combination of tactile, kinaesthetic and proprioceptive functions that allows us to determine what a foreign surface feels like, as well as its relation to our body. Haptic visuality is a derivative of this that allows the eyes to function as organs of touch, ostensibly sensing surfaces and their material qualities.



Fig. 4-15 Depiction of Lobby wall finish and lighting. Source: Author



Fig. 4-16 Depiction of the changing IMAX Screen sizes over time, the smallest screen size shown is the exact replica of the ANGA IMAX screen. Source: Ifexaminer.com

<u>Wall surfaces</u>: - The wall surfaces in the hall are rough and ribbed carpet to absorb echoes while the film is screening.

Floor surfaces: - The floor finish is carpet that is also rough for better absorption of noise inside.

<u>Seats</u>: - The seats are upholstered in smooth fabric for the patron's comfort and also for absorption with exposed plastic cup holders for utility.

<u>Temperature</u>: - The technical team at ANGA IMAX theatre keep their auditorium and the projection room between 22-23° Celsius. However, the internal temperature can be regulated based on the outside temperature. The hall is able to cool down quicker after screening because of high ceilings that allow any heat to escape to the top through mechanical ventilation.

4.2.6.5 Visual

<u>Screen</u>: - The screen at ANGA IMAX has been designed to make the audience feel like they are right in the action, rather than simply hearing and seeing from an outsider's view on the screen. The huge screen extends beyond the patron's peripheral view and the razor sharp images.

Lighting: - There's functional lighting provided on the aisle steps to illuminate the passage during screening when every other light source is off. Each step in the aisles is outlined with small LED strip lights to prevent patrons from tripping in the darkened theatre. There is also aesthetic lighting that is thematic with the interior design of the ANGA IMAX theatre. There are down lighters, recessed can lights and LED strip lights provided in the lobby soffit for ambient lighting.

4.2.6.6 Auditory

Sound is an integral part of the theatrical experience because the human brain can actually process audio faster than images. ANGA IMAX uses the 6.1 channel sound system with dedicated speakers for each track. The six-track system features front Left & Right, back Left & Right and two centre speakers and each is driven with separate audio tracks. The 6.1 channel surround sound configuration is just like a 5.1 surround system but includes an additional speaker channel located in the hall's centre rear, which helps to add another dimension. It creates a more realistic sound experience and makes for a wider, fuller sound in the theatre.

The speakers are directional, which allows them to distribute sound more evenly across the theatre, so each member of the audience hears as well as another. The speaker system also has a wider frequency response, making the high frequencies higher and lows even lower, so that they become vibrations on top of sound.

The custom designed speakers have a low frequency of 20 Hz and a high frequency limit of 20 kHz to offer a wider dynamic range in sound experience. A healthy young person is capable of hearing sound energy from about 20 to 20,000 Hz which the system provides for. Hearing sensitivity, especially the upper frequency limit of 20,000 Hz, diminishes with increasing age as shown in fig 4.18. The average human ear can detect vibrational energy or changes in air pressure as sound at the 0 decibel level but exceptional hearing has been recorded to detect sound at -5dB. The sound system in the hall has a wide range with a low limit of -3dB and a high limit of about 120dB.

Reflections down from the ceiling can often provide unwanted sound and therefore the ceilings have been made acoustically absorptive to curb this. The back walls of the hall which have a risk of providing late reflections to the audience have been provided with acoustic absorption in the form of fabric panelling. The audience seats and the audience themselves are usually the biggest acoustic absorption in the hall. The use of the right amount of acoustic absorption in the seats can serve as a great way to achieve the acoustic goals of the space.





Fig. 4-19 ANGA Sky theatre located in the Panari Sky Centre building as seen from Mombasa Road. Source: travelstart.co.ke/u75io/lkl865



Fig. 4-20 Location & access to the Panari Sky building housing the ANGA Sky theatre.

Source: JICA map: Survey of KENYA, Author modified

4.3 Case 2: ANGA Sky Theatre

4.3.1 Location

ANGA Sky cinema is situated on the 2nd floor of the Panari Sky Centre building, about 5 kilometres from Nairobi CBD in Embakasi South constituency, longitude 1°19'44.2"S latitude 36°51'21.5"E. The building is located along Mombasa Road and in a 5 kilometres radius from Jomo Kenyatta International Airport.

4.3.2 Background Information

The Blue Sky World Itd. partnered with IMAX Kenya and teamed up with Shark energy drink, Bacardi and Diamond Vodka to bring the ANGA Sky Cinema at the Panari Sky Centre Building. Blue Sky World is an investment company, which was set up in 1994 and participates as an investor and founder in different companies in the field of media, film and marketing services in Europe and Africa. These new theatres built on the premises were built exclusively for digital projection standards.

ANGA Sky Cinema theatres were opened on May, 2015 being the second cinema venture by Blue Sky World Itd. and run by ANGA cinemas in the county. The Cinema is in close proximity to other social entertainment spots like Attractions Playground, the Ice Rink and several restaurants. The location of the Cinema was targeted towards patrons who live along Mombasa Road. For the launch of ANGA Sky Cinema, patrons were treated to the premier of the highly anticipated 2015 Australian post-apocalyptic action film Mad Max Fury Road.

4.3.3 Geometry, Layout & Planning 4.3.3.1 Layout

ANGA SKY Cinema located in the Panari Sky Centre Building on Mombasa Road. The building is managed by the Nairobi Panari Hotels group. The theatre itself is accessed from the main entrance of the building from the patrons' car parking and the entrance has a double volume lobby with security guards stationed at the entrance. Access is restricted to patrons and customers of the various retail and leisure activities offered in the building. From the entry lobby, an elevator to the theatres on the second floor is provided on the left hand side with a service



Fig. 4-21 Depiction of Theatre lobby spatial disposition and circulation from main staircase and elevator. Source: Author



From the theatre lobby, patrons can access the two tickets & snack concession stands and the washroom areas which are demarcated for the two sexes appropriately. The washrooms are located in the circulation channel and are shared by a casino which is in close proximity with the theatre. There are single entry points into the cinema halls from the lobby which are manned by staff that check the validity of tickets and allow patrons into the hall through a series of steps that are 900mm wide. One of the entry points leads to the Sky Hall and the other leads to the Dream Hall as shown in fig 4.21 and 4.24.

4.3.3.2 Hall geometry/capacity



Fig. 4-22 The ANGA Sky theatre entrance showing lowered soffit level. Source: google.co.ke/45923

The theatre has just two cinema halls and both are equipped for digital projection standards. ANGA Sky has two identical halls that are each mirror opposite of the other. The Dream Hall and the Sky Hall are both rectangular in shape with the screen being located on the shorter side.

The Sky Hall has rows are arranged transversally with respect to the screen. The rows are 11 in number and labelled from A to K with row A having 12 seats, row B having 17 seats, row C having 18 seats, row D having 19 seats, row E having 20 seats, row F having 21 seats and row G having 14 seats which are couch-seats. Row H has 22 seats, row I has 21 seats, row J has 20 seats and row K has 22 seats on the last row. The Sky Hall auditorium hall is equipped with 206 seating capacity in total as shown in fig 4.24 and 4.24a.

The Sky Hall dimensions are approximately 13,800mm depth by 15,000mm length and a height of 8,000mm; this is demonstrated on fig 4.24.

4.3.3.3 Service spaces

This includes audience amenities that maximize customer experience in the facility. The typical amenities include the lobby, washrooms, ticket and concession stands.



Fig. 4-23 The Ticket & concession stand, showing floor, counter and ceiling finishes too. Source: Author

4.3.3.3 Service spaces

This includes audience amenities that maximize customer experience in the facility. The typical amenities include the lobby, washrooms, ticket and concession stands.

<u>Lobby</u>: - The lobby for ANGA Sky is about 4,000mm width by 4,000mm height. This is demonstrated on the sketches provided. The lobby has two ticket and concession stands that cater to the patrons. The lobby area does provide seating for patrons as they wait for their screening with padded leather seats of good quality.

<u>Ticket & Concession stand</u>: - The theatre has two stands that serve the patrons. They are both equipped with automated ticketing machines that accept cashless transactions as well as cash transactions with the option of patrons choosing the seats that they want instantaneously. The stands also provide choice of snacks that patrons can buy before and after the screening.

<u>Washrooms</u>: - There are two washrooms accessed from the circulation that leads to the lobby that serve the patrons and staff on the specific floor of the building. The two are delineated for the two sexes with wash hand basins and stalls inside.

4.3.3.4 Accessibility

<u>Crowd control</u>: - ANGA Sky has implemented the holdout line which prevents ticket holders for the next showing of that movie from entering the theatre until their particular auditorium has been cleared out and cleaned. In turn, ticket holders may be enticed to shop or eat while stuck outside in the holdout line. This has been realized in ANGA Sky because the lobby is rather large and has several seats. The theatre also has a large lounge space where patrons can also wait for their screening during a large film premier gathering.

<u>Security & Safety</u>: - Security guards are stationed at the ground floor entry points and serve the entire business ventures in the building as opposed to being responsible solely for the theatre. The theatre has 25 staff members that provide customer service throughout the facility even at the two hall entry/exit points. Fire safety has been considered inside the lobby with easily visible signage.


Fig. 4-24 Layouts of Cinema halls present at ANGA Sky Theatre. Source: Author



Fig. 4-25 Depiction of Lobby section at ANGA Sky Theatre. Source: Author



Fig. 4-26 Steps leading up into the Sky Hall at ANGA Sky Theatre. Source: Author

<u>Universal Access</u>: - ANGA Sky has not provided access for wheelchairs from the theatre lobby into the cinema halls which have steps leading up to their access as shown in fig 4.26. There exists stairs and steps that serve only the able bodied patrons and inhibit universal access. There are elevators that serve the entire building which can be used even for the less abled patrons. The circulation spaces are adequate for movement both inside the hall and outside the two halls.

4.3.4 Building Technology 4.3.4.1 Floors

The floor where the theatre is located is finished with 300mm square ceramic floor tiles. The stairs that lead up to the theatre level are also finished in ceramic floor tiles. The lobby floor is also finished in floor tiles all the way up to the hall entry/exit points while the washrooms are finished in ceramic floor tiles. The entry/exit pointss are made of timber steps that lead up into the halls. Inside the halls the floor is carpeted almost entirely with only a few exposed areas finished in ceramic tiles.

4.3.4.2 Walls

The structure of the Panari Sky Centre Building is reinforced concrete structure with masonry stone and curtain walls. The masonry walled walkways are finished in ceramic tiles while the retail outlet spaces are made of glass curtain walls. The lobby walls are all finished in ceramic tiles with display boards for advertisements hung on the walls. The washrooms are finished in glossy ceramic wall tiles to reflect light and add luminance to the spaces. The two cinema halls are padded in dark coloured carpet for non-reflectivity on all the four walls that absorb sound to prevent echo. To enhance sound absorption the walls also have drapes from the soffit level all the way to the floor.

4.3.4.3 Ceiling

The soffit level at the lobby is finished in lay-in-grid painted acoustic ceiling tiles that have apertures for lights. The soffit provides a single volume inside the lobby approximately 2,700mm in height. Inside the hall, the structure is made of steel trusses and covered with gypsum acoustic ceiling boards that are dark coloured. The hall ceiling is also innervated with HVAC vents that regulate the internal temperature of the hall.



Fig. 4-27 Depiction of Advertisement boards and Box Office booth. Source: Author



Fig. 4-28 Depiction of Lobby seats with natural lighting from clerestory windows and TV sets for patrons' repose. Source: Author

4.3.5 Technology

This section delves into the technological advancements employed in the construction, finishing and user experience of the motion picture space in the ANGA Sky Theatre halls.

4.3.5.1 Screen

There are two screens at ANGA Sky theatre with the Sky Hall auditorium is approximately 9,600mm by 5,500mm which is slightly over 31 feet wide by 18 feet high and the Dream Hall auditorium also has the same dimensions. The screen has a 1.75:1 aspect ratio that stretches over the front-side wall for digital projection.

The screen is a silver lenticular screen, white in colour and made of fabric mounted on steel framing and stretched for the whole length and height of the frame to achieve tautness. The ANGA Sky screen in the two Halls are capable of both 3D and 2D viewing for patrons who require special 3D glasses for viewing 3D films. The patrons are surcharged an extra fee for renting the 3D glasses provided by the management for the whole duration of the film if it's a 3D film.

4.3.5.2 Sound

The sound system in ANGA Sky theatre is Dolby Digital provided by Dolby Laboratories Incorporated an international company specializing in audio noise reduction and audio encoding & compression. Dolby Digital is an audio compression format that supports channel configurations from mono up to six discrete channels that first allowed and popularized surround sound. The Dolby Digital sound system is specifically Dolby Surround 7.1 with 7.1 surround speaker setups to deliver theatrical 7.1 surround sound which is an eight-channel system. The addition of two speaker channels in the rear gives an even fuller, rounded sound experience than the 5.1 surround sound. This is because the two side surround speakers won't be responsible for both rear and surround sound.

Both cinema halls utilize the Dolby 7.1 surround sound, with speakers that produce 10,000 watts of ear-pounding sound on all the four wall planes. This sound format predates Dolby Atmos format which is the most recent digital audio system by Dolby Laboratories Inc. There is a network of speakers in the theatre with some being concealed while others are exposed. The speakers are directional, which allows them to distribute sound more evenly across the theatre, including behind the screens to support a fuller three-dimensional sound effect.



Fig. 4-29 The Dream Hall seating layout at the ANGA Sky theatre in context with the Lobby and concession stands. Source: Author

The hall speakers have a wide dynamic range with a low frequency response that goes down to about 40 Hz. The high frequency response is also higher to offer a wider dynamic range in sound reproduction. Most standard cinema theatres are fitted with 8,000 watts, while the ANGA Sky theatre halls have 10,000 watts sound system.

4.3.5.3 Lighting

A successful design elicits an emotional human connection to the space, and lighting plays a crucial role in accomplishing this goal. Even on a tight budget, a few nice touches can go a long way to make an auditorium more inviting. Lighting has been used at ANGA Sky for general illumination necessary for public safety, way-finding and it serves a crucial role in creating excitement and eliciting emotion for patrons too.

4.3.5.4 Projector

The projector technology system in use at ANGA Sky is the digital projection system with Barco Company digital projectors for the two halls. The theatre has one Digital Cinema Initiative compliant 2K projector and one 4K projector that make motion picture experience very immersive. Both projectors have the dual projection setup that enables superimposition of the output onto each other with half a pixel offset resulting in a higher perception of overall resolution and even better contrast. The projection system at ANGA Sky uses polarization to create the 3D effect however; it utilizes linear polarization instead of circular polarization.



Fig. 4-30 Depiction of The Barco DP4K-23B cinema projector similar to the one in use inside the Sky Hall. Source: https://cinemanext.com/barco-dp4k-23b



SURROUND 7.1

Fig. 4-31 Depiction of Dolby digital logo & Dolby 7.1 surround logo that provide sound for the halls in ANGA Sky theatre. Source: dolby.com



Fig. 4-32 Depiction of LED lights & drapery inside the Sky Hall. Source: Author



Fig. 4-33 Sketch section of the Seating in the Sky Hall Source: Author

4.3.6 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal cinema environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.

4.3.6.1 Seating layout

The seating layout at ANGA Sky in both auditorium halls is the multiple-aisle seating as shown in fig 4.24 and 4.29.

Stadium seating is in use in the two halls at ANGA Sky. This gives patrons a clear sight line over the heads of those seated in front of them. Intimacy, the shared experience and audience enjoyment are significantly impacted by the relationship of seats not only to the screen, but also to each other. The seats are numbered individually and arranged in rows each seat with armrests that demarcate the seating area.

4.3.6.2 Floor Raking

The Stadium seating has all the rows on rakes to maximize sightlines. The two auditorium halls are not steeply raked; the floor to ceiling height from row A being 7,000mm and the floor to ceiling height from row K being 5,400mm. The aisle steps are 150mm high for the risers and 300mm for the treads. The sketches in fig 4.33 and 4.35 depict the findings. The raked seating is approximately between 9 and 10 degrees.

4.3.6.3 Sightlines

The step-down between the rear and the front seats in the Sky Hall is fairly shallow approximately 1,650mm but this still provides uninhibited sightlines for all patrons from their seats all the way to the screen at the front. The last row at the back of the row is slightly staggered from the immediate row in front of it to further enhance the sightlines. The sketches in fig 4.33 and 4.35 depict the findings.



Fig. 4-34 Screening of the film "Black and Blue" inside the ANGA Sky Hall on 26 October 2019. Source: Author



Fig. 4-35 Section of seating rake and sightlines in the Sky Hall Source: Author

4.3.6.4 Tactile

<u>Wall surfaces</u>: - The carpeted wall surfaces inside the auditorium hall are rough and ribbed and the draperies are soft to absorb echoes while the film is screening.

<u>Floor surfaces</u>: - The floor finish is carpet that is also rough for better absorption of noise inside the auditorium. There's also areas of exposed ceramic floor tiles.

<u>Seats</u>: - The seats are upholstered in smooth fabric for the patron's comfort and also for absorption with exposed plastic cup holders for utility.

<u>Temperature</u>: - The technical team at ANGA Sky theatre keep their auditorium halls and the projection room between 20-23 degrees Celsius.

4.3.6.5 Visual

<u>Screen</u>: - There are two screens at ANGA Sky theatre. The approximately 12,500mm by 6,500mm screens form part of the aesthetic of the auditorium halls as they are designed as part of the front wall and provide razor sharp images when displays are projected upon them.

Lighting: - There's functional lighting provided on the aisle steps to illuminate the passage during screening when every other light source is off. Each step in the aisles is outlined with small LED strip lights to prevent patrons from tripping in the darkened theatre. There's also wall sconce lighting as part of the drapery aesthetic for the side walls for both auditorium halls that is thematic with the interior design of the ANGA Sky theatre. There are also downlighters provided in the lobby soffit for general lighting.

4.3.6.6 Auditory

ANGA Sky uses the Dolby Digital 7.1 channel sound system with dedicated speakers for each track. The seven-track system features front Left & Right, back Left & Right and three centre speakers and each is driven with separate audio tracks. It is an eight channel system with the addition of two speakers in the rear to give an even fuller, rounded sound experience. This configuration has seven main channels plus an effects channel. The effects channel uses a subwoofer and is often called the boom channel because its main use is for explosions and other powerful sounds.



Fig. 4-36 Depiction of the Diamond Plaza II building from Pramukh Swami Avenue. Source: Author



Fig. 4-37 Location & access to the Diamond Plaza II building housing the ANGA Diamond theatre.

Source: JICA map: Survey of KENYA, Author modified

The speakers are directional, which allows them to distribute sound more evenly across the theatre, so each member of the audience hears as well as another. The speaker system also has a wider frequency response, making the high frequencies higher and lows even lower, so that they become vibrations on top of sound.

4.4 Case 3: ANGA Diamond Theatre

4.4.1 Location

ANGA Diamond Plaza cinema is situated on the 11th floor of the Diamond Plaza II building located in Parklands, Westlands constituency about 1.5 kilometres from Nairobi CBD, longitude 1°15'30.4"S latitude 36°49'08.4"E. The building is on the junction of the Pramukh Swami Avenue and Fourth Parklands Avenue.

4.4.2 Background Information

The ANGA Diamond Cinema is the third outlet of the ANGA Cinemas in the Nairobi County. The cinema opened with three theatres built exclusively for digital projection standards with the fourth hall yet to be completed as of the fieldwork visits conducted by the author. ANGA Diamond Cinema theatre was opened on March, 2018 being the third cinema venture owned internationally by Blue Sky World ltd. in the county. The Theatre is in close proximity to other social entertainment spots like 4 star hotels, restaurants and other attractions. Parking both internally and externally is provided for about 900 vehicles.

The location of the Cinema was targeted towards patrons who live in Parklands which is largely Kenyans of Indian descent and this necessitated regular showing of Bollywood films. Besides catering to the affluent neighbourhoods, it is very close to major roadways making it accessible to other nearby residents and commercial establishments too.

4.4.3 Geometry, Layout & Planning 4.4.3.1 Layout

ANGA Diamond is located at Diamond Plaza II building alongside other business ventures in the same building including a hotel, restaurant, amusement park, office spaces among others. The



Fig. 4-38 The spatial disposition inside ANGA Diamond Theatre, with the three functional halls highlighted. Source: Author



Fig. 4-39 Depiction of the Lobby in use during a film premier event at ANGA Diamond.

Source: https://www.google.com/maps/uv?hl=en&pb=!1sox182f17ef2

theatre itself is accessed from the central lobby on the upper ground floor in the building that connects the building to Pramukh Swami Avenue, this access is semi-public in that access is restricted by the building's security service. From the circulation lobby there are four elevators that lead up to the 11th floor where the theatre lobby is located. The elevators serve the entire building complex and are transparent with views of the surrounding neighbourhood on display.

From the lobby, patrons can access the two ticket and snack concession stands and the washroom areas which are demarcated for the two sexes appropriately. There are clearly labelled entry points into each of the three cinema halls from the lobby which are manned by staff that check the validity of tickets and allow patrons into the hall during a screening. There are a lot of repose spaces provided in the lobby as patrons wait for their screening and even for after screening interactions. The lobby space is sometimes used for film premier events and cocktail parties and is an approximately one and a half volume measuring 4550mm from finished floor level to the lowest gypsum ceiling bulkhead as shown in fig 4.41.

4.4.3.2 Hall geometry/capacity

The theatre has four cinema halls with the fourth hall being yet unveiled for use. The other halls at ANGA Diamond are dubbed Diamond Hall, Dream Hall and Sky Hall each with different seating capacities. All the halls are rectangular shape in floor plan layout with the screen being located on the shorter side with rows being arranged transversally with respect to the screen.

The <u>Sky Hall</u> is the first cinema hall with 8 rows from row A to row H. Row A & B having 12 seats, row C, D & E having 13 seats each and row F, G & H having 16 seats each. This brings the total capacity the hall supports to 111 patrons.

The <u>Diamond Hall</u> is the second cinema hall with 8 rows from row A to row H. Row A, B, C, D, E & F having 15 seats and row G & H having 19 seats each. This brings the capacity the hall supports to 128 patrons.

The <u>Dream Hall</u> is the third cinema hall with 8 rows from row A to row H. Row A, B, C, D, E & F having 13 seats and row G & H having 17 seats each. This brings the capacity the hall supports to 112 patrons.





Fig. 4-43 Depiction of Bench seating inside the lobby. Source: Author



Fig. 4-44 Depiction of Table & chair seating for groups inside the lobby. Source: Author The author was allowed to take measurements of the Diamond Hall which has the biggest capacity and the hall dimensions are 11,500mm depth by 15,000mm length and a height of 7,600mm; this is demonstrated on the sketches provided in fig 4.42 and fig 4.46.

4.4.3.3 Service spaces

This includes audience amenities that maximize customer experience in the facility. The typical amenities include the lobby, washrooms, ticket and concession stands.

<u>Lobby</u>: - The lobby for ANGA Diamond is approximately 9,000mm at the widest point by 40,000mm length with a soffit level of 4,550mm. This is demonstrated on the sketches provided. The lobby has two ticket and concession stands that cater to the patrons aptly labelled. The lobby area provides a lot of seating and space for patrons as they wait for their screening which is a plus in the service quality.

<u>Ticket & Concession stand</u>: - The theatre has two stands that serve the patrons. They are both equipped with automated ticketing machines that accept cashless transactions as well as cash transactions with the option of patrons choosing the seats that they want instantaneously. The stands also provide choice of snacks that patrons can buy before and after the screening.

<u>Washrooms</u>: - There are two washrooms accessed from the lobby that serve the patrons and staff on the eleventh floor of the building. The two are delineated for the two sexes with wash hand basins and stalls inside.

4.4.3.4 Accessibility

This includes how people, equipment and supplies move effectively and safely through the building.

<u>Crowd control</u>: - ANGA Diamond has implemented the holdout line which prevents ticket holders for the next showing of that movie from entering the theatre until their particular auditorium has been cleared out and cleaned. Ticket holders are enticed to shop or eat while stuck outside in the holdout line in the supermarket located inside the building. This has been realized in ANGA Diamond because the lobby is rather large and has a lot of seats.



Fig. 4-45 Depiction of Cinema Hall 4 currently under construction at ANGA Diamond, showing materials used as of 06 September 2019. Source: Author

<u>Security & Safety</u>: - Security guards are stationed at the ground floor entry points and serve the entire business ventures in the building as opposed to being responsible solely for the theatre. Still the theatre has a security desk at the theatre lobby entry. There are 10 members of staff for the day to day running of the theatre. Fire safety has been considered inside the lobby with easily visible signage and fire fighting cylinders located visibly.

<u>Universal Access</u>: - ANGA Diamond lobby is accessible by wheelchair from the elevators and the halls are also accessible by wheelchair due to absence of steps in the hall entrances. The wheelchair access ends at the front row of the different auditorium halls though. The circulation spaces are adequate for movement both inside the halls and outside the halls for both ablebodied and the less able-bodied patrons.

4.4.4 Building Technology 4.4.4.1 Floors

The structural floor at the theatre level is a concrete floor slab finished with 600mm square ceramic floor tiles which extends to most of the areas on the theatre level. The entry/exit points are carpeted with maroon coloured fabric and this finish is extended into the different halls which are also carpeted fully on all floor surfaces.





Fig. 4-47 Depiction of Concession stand, lobby seating and drapery covering the entrance to the Dream Hall. Source: Author

4.4.4.2 Walls

The structure of the Diamond Plaza II Building is reinforced concrete structure with masonry stone and curtain walls. The lobby walls are all finished in ceramic tiles with display boards for advertisements hung on the walls. The washrooms are finished in glossy ceramic wall tiles to reflect light and add luminance to the spaces. The three cinema halls are padded in dark coloured carpet for non-reflectivity on all the four walls that absorb sound to prevent echo. **4.4.4.3 Ceiling**

The soffit level at the lobby is finished in painted gypsum boards and bulkheads that have apertures for downlighters with LED strip lighting on the vertices. The soffit provides a one and a half volume inside the lobby. Inside the hall, the structure is made of steel trusses and covered with gypsum acoustic ceiling boards that are dark coloured. The hall ceiling is also innervated with HVAC vents that regulate the internal temperature of the hall.

4.4.5 Technology 4.4.5.1 Screen

There are 3 similar screens at ANGA Diamond theatre, one in each auditorium hall. The one in Diamond Hall is approximately 10,500mm by 6,500mm which is slightly over 34 feet wide by 21 feet high and its size is the first thing you notice when you first enter the hall. The screen has a 1.65:1 aspect ratio that stretches over the front-side wall and is capable of digital technology projection.

The screen is a silver lenticular screen, white in colour and made of fabric mounted on steel framing and stretched for the whole length and height of the frame to achieve tautness. The ANGA Diamond screens are capable of both 3D and 2D viewing and provide for patrons 3D glasses for viewing 3D films. The patrons are surcharged an extra fee for renting the 3D glasses for the whole duration of the film if it's a 3D film. The screens also have hundreds of small, evenly spaced holes to allow air to and from the speakers and subwoofer behind the screens.

4.5.5.2 Sound

The sound system in ANGA Diamond theatre is Dolby Digital provided by Dolby Laboratories Incorporated. The Dolby Digital sound system is specifically Dolby Surround 7.1 with 7.1 surround speaker setups to deliver theatrical 7.1 surround sound which is an eight-channel system.



Fig. 4-48 Depiction of Dolby digital logo & Dolby 7.1 surround logo that provide sound for the halls in ANGA Diamond theatre. Source: dolby.com



Fig. 4-49 Depiction of 7.1 surround sound configuration inside both halls in the ANGA Diamond theatre. Source: soundandvision.com



Fig. 4-50 Depiction of DP2K-10Sx projectors in se at the Theatre. Source: https://www.mteworld.com/barco-dp2k-10sx-compact-digitalcinema-projector-for-screens-up-to-10m-33ft-wide/

All the cinema halls utilize the Dolby 7.1 surround sound, with speakers that produce 10,000 watts of ear-pounding sound on all the four wall planes. This sound format predates Dolby Atmos format which is the most recent digital audio system by Dolby Laboratories Inc. There is a network of speakers in the theatre with some being concealed while others are exposed. The speakers are directional, which allows them to distribute sound more evenly across the theatre, including behind the screens to support a fuller three-dimensional sound effect.

The hall speakers have a wide dynamic range with a low frequency response that goes down to about 40 Hz. The high frequency response is also higher to offer a wider dynamic range in sound reproduction. Most standard cinema theatres are fitted with 8,000 watts, while the ANGA Diamond theatre halls have 12,000 watts sound system.

4.5.5.3 Lighting

Lighting has been used at ANGA Diamond for general illumination necessary for public safety, way-finding and it serves a crucial role in creating excitement and eliciting emotion for patrons too.

4.4.5.4 Projector

The projector technology system in use at ANGA Diamond is the digital projection system with Barco Company digital projectors for the halls. The theatre has four Digital Cinema Initiative compliant DP2K-10Sx projectors one for each hall that make motion picture experience very immersive. All the Digital projectors have the dual projection setup that enables superimposition of the output onto each other with half a pixel offset resulting in a higher perception of overall resolution and even better contrast. The projection system at ANGA Diamond uses polarization to create the 3D effect however; it utilizes linear polarization instead of circular polarization.



Fig. 4-51 Depiction of Raked seating inside the Diamond Hall. Source: Author



Fig. 4-52 Depiction of auditorium seats inside the Diamond Hall. Source: Author

4.4.6 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal acoustic environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.

4.4.6.1 Seating layout

The seating layout at ANGA Diamond is the continental seating layout which allows for more seating space with an aisle on each end as shown in the sketch in fig 4.42 provided.

Stadium seating, that is popular in modern multiplexes, is in use in the halls at ANGA Diamond. This gives patrons a clear sight line over the heads of those seated in front of them. Intimacy, the shared experience and audience enjoyment are significantly impacted by the relationship of seats not only to the screen, but also to each other. The seats are numbered individually and arranged in rows each seat with armrests that demarcate the seating area.

4.4.6.2 Floor Raking

The Stadium seating has all the rows on rakes to maximize sightlines. The auditorium halls are not steeply rakedwith the floor to ceiling height in Diamond Hall from row A being about 7,200mm and the floor to ceiling height from row H being about 5,000mm a difference of 2,200mm. The aisle steps are 150mm high for the risers and 300mm for the treads. The sketches provided in fig 4.46 and 4.51 depict the findings. The raked seating is approximately 15 degrees from the horizontal plane.

4.4.6.3 Sightlines

The step-down between the rear and the front seats in the Diamond Hall is fairly shallow approximately 2,200mm but this still provides uninhibited sightlines for all patrons from their seats all the way to the screen at the front. The last row at the back of the row is slightly staggered from the immediate row in front of it to further enhance the sightlines. The sketches are provided in fig 4.46 and 4.51.



Fig. 4-53 Depiction of auditorium entrance covered in drapes for extra absorption of noise at ANGA Diamond theatre. Source: Author

4.4.6.4 Tactile

<u>Wall surfaces</u>: - The carpeted wall surfaces inside the auditorium hall are rough and ribbed and the draperies are soft to absorb echoes while the film is screening.

<u>Floor surfaces</u>: - The floor finish is carpet that is also rough for better absorption of noise inside the auditorium.

<u>Seats</u>: - The seats are upholstered in smooth fabric for the patron's comfort and also for absorption with exposed plastic cup holders for utility.

<u>Temperature</u>: - The technical team at ANGA Diamond theatre keep their auditorium halls and the projection room between 20-25° Celsius.

4.4.6.5 Visual

<u>Screen</u>: - There are three functional screens at ANGA Diamond theatre designed to make the audience feel like they're part of the immersive experience. The approximately 10,500mm by 6,500mm screens form part of the front plane of the auditorium halls and provide razor sharp images when displays are projected upon them.

<u>Lighting</u>: - There's functional lighting provided on the aisle steps to illuminate the passage during screening when every other light source is off. Each step in the aisles is outlined with small LED strip lights to prevent patrons from tripping in the darkened theatre. There's also wall sconce lighting that is thematic with the interior design of the ANGA Diamond theatre. There are concealed LED lights and recessed can lights also provided in the lobby soffit for ambient lighting.

4.4.6.6 Auditory

ANGA Diamond uses the Dolby Digital 7.1 channel sound system with dedicated speakers for each track. The seven-track system features front Left & Right, back Left & Right and three centre speakers and each is driven with separate audio tracks. It is an eight channel system with the addition of two speakers in the rear to give an even fuller, rounded sound experience. This configuration has seven main channels plus an effects channel.



Fig. 4-54 The Junction Building housing diverse retail tenants and the Century Cinemax Junction Theatre.



Fig. 4-55 Location & access to the Junction building housing the Century Cinemax Junction theatre. Source: JICA map: Survey of KENYA, Author modified

4.5 Case 4: Century Cinemax - Junction Theatre

4.5.1 Location

Century Cinemax Junction Theatre is situated on the first floor of The Junction Mall building located in Kilimani, Dagoretti North constituency, about 6 kilometres from Nairobi CBD, longitude 1°17'52.2"S latitude 36°45'45.5"E. The Junction Mall building is along Ng'ong Road, bordered by Kingara Road and Riara Road.

4.5.2 Background Information

The growing demand for high quality movie entertainment systems locally prompted the entry of the Century Cinemax into the Kenyan market. The theatre company took over the cinema space in the Junction Mall from Nigeria's Silverbird Film Distribution in 2011/2012 which had taken stewardship of the space from South Africa's NuMetro Cinemas in 2008. Century Cinemax is an East African company with presence in Kenya, Uganda, Tanzania and Rwanda. The company has ties to Century Pictures Itd. which distributes 20th Century film releases in the larger Eastern African region and Zambia under license. Century Cinemax opened the Theatre in 2012 at Junction Mall as their first branch in Kenya with four operational cinema halls.

4.5.3 Geometry, Layout & Planning 4.5.3.1 Layout

Century Cinemax Junction is located at Junction Mall building alongside other over 100 business ventures in the same building complex including a Carrefour supermarket, food court outlets and a bureau de change among others. The theatre itself is accessed from the central arcade on ground floor in the building that connects the front side of the complex facing Ng'ong Road. The arcade forms the main circulation for the complex with majority of the retail outlets facing the circulation channels. The arcade is semi-public in that access is restricted by the building's security service. At the end of the arcade facing the main entrance there is an elevator lobby with two sets of stairs each on either side that lead up to the theatre lobby on the first floor level. The stairs are standard 300mm x 150mm tread and riser with a width of 1,200mm with a railing at a height of 900mm.



From the lobby, patrons can access the concession stands, the cinema halls and the washroom areas which are demarcated for the two sexes appropriately. There are single entry points into each of the cinema halls from the lobby which are manned by staff that check the validity of tickets and allow patrons into the hall through a series of corridors that are about 1,500mm wide as shown in fig 4.59 and 4.66. The lobby area has adequate space and seating options for patrons overlooking the arcade below.

4.5.3.2 Hall geometry/capacity

The theatre has four cinema halls with all being available for use by the patrons. The halls are labelled one to four each with a different seating capacity but nearly identical features. All the halls are rectangular shape in floor plan layout with the screen being located on the shorter side with rows being arranged transversally with respect to the screen.

Fig. 4-56 View of Century Cinemax Junction Theatre balcony from Entrance Arcade. Source: Author



Fig. 4-57 View of Entrance Arcade from the Century Cinemax Junction Lobby balcony. Source: Author

<u>Hall 1</u> is the first cinema hall with 12 rows from row A to row L. Row A having 9 seats, row B to row E having 12 seats, row F having 7 seats, row G to row K having 9 seats each and row L having 10 seats. This brings the total capacity the hall supports to 110 patrons.

<u>Hall 2</u> is the second cinema hall with 14 rows from row A to row N. Row A to row E having 17 seats, row F having 11 seats, row G to row M having 14 seats each and row N having 16 seats. This brings the total capacity the hall supports to 196 patrons.

<u>Hall 3</u> is the third cinema hall with 13 rows from row A to row M. Row A to row E having 13 seats, row F having 7 seats, row G to row L having 10 seats each and row M having 12 seats. This brings the total capacity the hall supports to 134 patrons.

<u>Hall 4</u> is the fourth cinema hall with 13 rows from row A to row M. Row A to row E having 16 seats, row F having 10 seats, row G to row L having 13 seats each and row M having 14 seats. This brings the total capacity the hall supports to 182 patrons.

The author was allowed to take measurements of the Cinema Hall 2 which has the biggest capacity and the hall dimensions are 10,500mm depth by 17,000mm length and a height of 7,500mm; this is demonstrated on the sketches provided in fig 4.58 and 4.59.

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Fig. 4-58 Depiction of Access to the Theatre from Ground floor level elevator and stairs.

4.5.3.3 Service spaces

<u>Lobby</u>: - The lobby for Century Cinemax Junction is approximately 8,000mm at the widest point by 24,000mm length with a soffit level of 4,550mm. This is demonstrated on the sketches provided. The lobby has one ticket and concession stand that is split into different stations that cater to the patrons aptly labelled. The lobby area provides a lot of seating and space for patrons as they wait for their screening which is a plus in the service quality.

<u>Ticket & Concession stand</u>: - The theatre has one ticket and concession stand that is split into different stations that serve the patrons. The stations are all equipped with automated ticketing machines that accept cashless transactions as well as cash transactions with the option of patrons choosing the seats that they want instantaneously. The stations also provide choice of snacks that patrons can buy before and after the screening.





Fig. 4-60 Depiction of Seating options on the lobby at Century Cinemax Junction theatre. Source: Author



Fig. 4-61 Depiction of Service counters, ticket & concession stands accessed from the lobby. Source: Author

<u>Washrooms</u>: - There are two washrooms accessed from the lobby that serve the patrons and staff on the theatre. The two are delineated for the two sexes with wash hand basins and stalls inside.

4.5.3.4 Accessibility

<u>Crowd control</u>: - Century Cinemax has implemented the holdout line. Ticket holders may be enticed to shop or eat while stuck outside in the holdout line. This is possible because the lobby is rather large and has a lot of seats plus the complex offers a variety of retail outlets.

<u>Security & Safety</u>: - Security guards are stationed at the ground floor entry points and serve the entire business ventures in the Complex as opposed to being responsible solely for the theatre. The theatre has 15 staff members that provide appropriate customer service throughout the facility. Fire safety has been considered inside the lobby with easily visible signage and fire fighting cylinders located visibly.

<u>Universal Access</u>: - The lobby is accessible by wheelchair from the elevator and the halls are also accessible by wheelchair due to absence of steps in the hall entrances. The wheelchair access ends in the different auditorium halls though as the back rows aren't accessible. The circulation spaces are adequate for movement both inside the halls and outside the halls for both ablebodied and the less able-bodied patrons.

4.5.4 Building Technology

4.5.4.1 Floors

The ground floor arcade entry is a concrete floor slab finished with 600mm square ceramic floor tiles. The stairs that lead up to the theatre level are also finished in ceramic tiles. The structural floor at the theatre level is a concrete floor slab finished with 600mm square ceramic floor tiles which extends to most of the areas on the theatre level. The entry/exit points are carpeted with dark coloured fabric and this finish is extended into the different halls which are also carpeted fully on all floor surfaces.



Fig. 4-62 Depiction of Cinema Hall one & two entryways with appropriate signage. Source: Author

4.5.4.2 Walls

The basic structure of the Junction Mall Building is reinforced concrete structure with masonry stone and curtain walls. The lobby walls are all finished in patterned wall carpet fabric with display boards for advertisements hung on the walls. The washrooms are finished in glossy ceramic wall tiles to reflect light and add luminance to the spaces. The four cinema halls are padded in dark coloured carpet for non-reflectivity on all the four walls that absorb sound to prevent echo.

4.5.4.3 Ceiling

The soffit level at the lobby is finished in painted gypsum boards and bulkheads that have apertures for downlighters with LED strip lighting on the vertices. The soffit provides a single volume inside the lobby in contrast with the arcade below. Inside the hall, the structure is made of steel trusses and covered with gypsum acoustic ceiling boards that are dark coloured. The hall ceiling is also innervated with HVAC vents that regulate the internal temperature of the hall.

4.5.5 Technology

This section delves into the technological advancements employed in the construction, finishing and user experience of the motion picture space in the Century Cinemax Junction Theatre halls.

4.5.5.1 Screen

There are 4 similar screens at Century Cinemax Junction theatre, one in each auditorium hall. The one in Cinema Hall 2 which the author was allowed access to is approximately 9,200mm by 5,600mm which is slightly over 30 feet wide by 18 feet high. The screen has a 1.65:1 aspect ratio that stretches over the front-side wall and is capable of digital technology projection. The hallmark of visual immersion is suggested as long as the screen takes up or exceeds ones entire field of vision.

The screen is a silver lenticular screen, white in colour and made of fabric mounted on steel framing and stretched for the whole length and height of the frame to achieve tautness. The four screens are capable of both 3D and 2D viewing. The patrons are surcharged an extra fee for renting the 3D glasses provided by the management for the whole duration of a 3D film.



Fig. 4-63 Depiction of the lobby space showing ceiling treatment, wall treatment and floor finish in the common space. Source: Author



Fig. 4-64 The Dolby digital logo & Dolby 7.1 surround logo that provide sound for the halls in Century Cinemax Junction theatre. Source: dolby.com

4.5.5.2 Sound

The sound system in Century Cinemax junction theatre is Dolby Digital provided by Dolby Laboratories Incorporated. The Dolby Digital sound system is specifically Dolby Surround 7.1 with 7.1 surround speaker setups to deliver theatrical 7.1 surround sound which is an eight-channel system.

All the cinema halls utilize the Dolby 7.1 surround sound, with speakers that produce 10,000 watts of ear-pounding sound on all the four wall planes. This sound format predates Dolby Atmos format which is the most recent digital audio system by Dolby Laboratories Inc. There is a network of speakers in the theatre with some being concealed while others are exposed. The speakers are directional, which allows them to distribute sound more evenly across the theatre, including behind the screens to support a fuller three-dimensional sound effect.



Fig. 4-66 Sketch section of the cinema hall two in Century Cinemax Junction theatre. Source: Author

Fig. 4-65 The column finishes on the lobby at the Junction theatre. Source: Author



Fig. 4-67 Depiction of Cinema hall three entryway exhibiting the recessed entrance and the Dolby Digital signage. Source: Author

The hall speakers have a wide dynamic range with a low frequency response that goes down to about 40 Hz. The high frequency response is also higher to offer a wider dynamic range in sound reproduction. Most standard cinema theatres are fitted with 8,000 watts, while the Century Cinemax Junction theatre halls have 10,000 watts sound system.

4.5.5.3 Lighting

Strip LED lighting has been used in alcoves inside the gypsum ceiling to give an ambient glow in line with the architecturally interesting ceiling. Sconce lighting has also been used inside the halls to make the venue infinitely more inviting and the lights are dimmable units that are lowered just before the film starts.

Lighting has also been used at Century Cinemax Junction for general illumination necessary for public safety, way-finding and it serves a crucial role in creating excitement and eliciting emotion for patrons too.

4.5.5.4 Projector

The projector technology system in use at Century Cinemax Junction is the digital projection system with Barco Company digital projectors for the halls. The theatre has four Digital Cinema Initiative compliant 2K resolution Xenon bulb projectors one for each hall that make motion picture experience very immersive. All the Digital projectors have the dual projection setup that enables superimposition of the output onto each other with half a pixel offset resulting in a higher perception of overall resolution and even better contrast.

The projection system at Century Cinemax Junction uses polarization to create the 3D effect however; it utilizes linear polarization instead of circular polarization. The management reported that the current projectors in use had just been acquired at the beginning of the year 2019.



Fig. 4-68 Depiction of staircase accessing the Junction Theatre on first floor level from the Ground floor level. Source: Author

900 900

Fig. 4-69 Sketch section of the raking in cinema hall two atCentury Cinemax Junction theatre. Source: Author

4.5.6 Ergonomics & Sensorial factors 4.5.6.1 Seating layout

The seating layout at Century Cinemax Junction is a modified continental seating layout with one aisle on a particular end as shown in fig 4.59 provided. Stadium seating, that is popular in modern multiplexes, is in use in the halls at Century Cinemax Junction. This gives patrons a clear sight line over the heads of those seated in front of them. Intimacy, the shared experience and audience enjoyment are significantly impacted by the relationship of seats not only to the screen, but also to each other. The seats are numbered individually and arranged in rows each seat with armrests that demarcate the seating area. The Theatre also provides lounge seats that enable patrons to recline during a screening at row F in the cinema Hall 2 as shown in fig 4.59.

4.5.6.2 Floor Raking

The Stadium seating has all the rows on rakes to maximize sightlines. The auditorium halls are not steeply raked with the floor to ceiling height in Cinema Hall 2 from row A being about 7,500mm and the floor to ceiling height from row N being about 5,400mm a difference of 2,100mm. The aisle steps are 150mm high for the risers and 900mm for the treads. The sketch in fig 4.67 depicts the findings. The raked seating is approximately between 9 and 10 degrees from the horizontal plane.

4.5.6.3 Sightlines

The step-down between the rear and the front seats in the Cinema Hall 2 is fairly shallow approximately 2,100mm but this still provides uninhibited sightlines for all patrons from their seats all the way to the screen at the front. The last row at the back of the row is slightly staggered from the immediate row in front of it to further enhance the sightlines. The sketch provided in fig 4.59 depicts the findings.

4.5.6.4 Tactile

<u>Wall surfaces</u>: - The carpeted wall surfaces inside the auditorium hall are rough and ribbed and the draperies are soft to absorb echoes while the film is screening as shown in fig 4.70.



Fig. 4-70 Internal view of Cinema Hall 3 at the Junction Theatre. Source: Author

<u>Floor surfaces</u>: - The floor finish is carpet that is also rough for better absorption of noise inside the auditorium.

<u>Seats</u>: - The seats are upholstered in smooth fabric for the patron's comfort and also for absorption with exposed plastic cup holders for utility.

<u>Temperature</u>: - The technical team at Century Cinemax Junction theatre keep their auditorium halls and the projection room between 20-25 degrees Celsius. However, the internal temperature can be regulated based on the outside temperature. The hall is able to cool down from mechanical means in the acoustic ceiling above.

4.5.6.5 Visual

<u>Screen</u>: - There are four functional screens at Century Cinemax Junction theatre designed to make the audience feel like they're part of the immersive experience. The approximately 9,200mm by 5,600mm screens form part of the front plane of the auditorium halls and provide razor sharp images when displays are projected upon them.



Fig. 4-71 Screening of the film "Hobbs & Shaw" inside Cinema Hall 2 on 26 July 2019. Source: Author

Lighting: - There's functional lighting provided on the aisle steps to illuminate the passage during screening when every other light source is off. Each step in the aisles is outlined with small LED strip lights to prevent patrons from tripping in the darkened theatre. There's also wall sconce lighting that is thematic with the interior design of the theatre. There are concealed LED lights and recessed can lights also provided in the lobby soffit for ambient lighting.

4.5.6.6 Auditory

Century Cinemax Junction uses the Dolby Digital 7.1 channel sound system with dedicated speakers for each track. The seven-track system features front Left & Right, back Left & Right and three centre speakers and each is driven with separate audio tracks. It is an eight channel system with the addition of two speakers in the rear to give an even fuller, rounded sound experience. This configuration has seven main channels plus an effects channel. The effects channel uses a subwoofer and is often called the boom channel because its main use is for explosions and other powerful sounds.



Fig. 4-72 The Garden city Century Cinemax theatre lobby. Source: https://www.dec-design.com/nairobi



Fig. 4-73 Location & access to the Garden City Complex housing the Century Cinemax Junction theatre. Source: JICA map: Survey of KENYA, Author modified

4.6 Case 5: Century Cinemax - Garden City Theatre

4.6.1 Location

Century Cinemax Garden City Theatre is situated on the first floor of the Garden City Complex located along Thika Superhighway in Kasarani constituency, about 6 kilometres from Nairobi CBD, longitude 1°13'58.9"S latitude 36°52'45.6"E. The Garden City Complex is along the Thika Superhighway in the neighbourhood of Ngumba Estate and East African Breweries Itd headquarters.

4.6.2 Background Information

Century Cinemax partnered with Actis an international developer that is responsible for the Garden City Complex to manage the cinema space of the facility upon its completion. Century Cinemax is an East African company with presence in Kenya, Uganda, Tanzania and Rwanda. The company has ties to Century Pictures Itd. which distributes 20th Century film releases in the larger Eastern African region and Zambia under license. Century Cinemax opened the Theatre in October/November 2016 at Garden City complex as their second branch in Kenya with five operational cinema halls.

Garden City complex is an integrated residential, retail and office development, including a threeacre central park, dedicated children's play area and generous lawns and gardens. Homeowners and residential tenants enjoy private access to fully equipped gym, heated swimming pool and clubhouse and the convenience of living alongside a thriving mall with over 100 shops, a range of popular restaurants, bars and cafes, and East Africa's largest IMAX cinema.

These integrated amenities complete the perfect mix of the 'live, work and play' themed Garden City development and offer excellent add-on value to the anticipated office community from Garden City Business Park yet to be completed. Century Cinemax opened their theatre banking on the mixed development offering of shops, restaurants and a residential complex to tap foot traffic. Out of the five cinema halls, Century Cinemax partnered with IMAX to have one of the halls made to become the second IMAX screen in the country and the largest in East Africa.



Fig. 4-74 The Garden city Mall complex layout with Theatre location highlighted.

Source: https://gardencity-nairobi.com/shopping-mall/



Fig. 4-75 The Century Cinemax Garden City Theatre in context on the first floor level. Source: Author

4.6.3 Geometry, Layout & Planning 4.6.3.1 Layout

Century Cinemax Garden City is located at Garden City a thriving mall with over 100 shops, a range of popular restaurants, bars and cafes. The theatre itself is accessed from the central arcade on ground floor either by escalator or elevator onto the first floor. The arcade forms the main circulation for the complex with majority of the retail outlets facing the circulation channels. On the first floor patrons use the expansive walkways overlooking the arcade below to access the theatre lobby which is on the first floor level. From the lobby, patrons can access the concession stands, the cinema halls and the washroom areas which are demarcated for the two sexes appropriately. There are single entry points into each of the cinema halls from the lobby which are manned by staff that check the validity of tickets and allow patrons into the hall through a series of corridors that are about 1,500mm wide. The lobby area has adequate space and seating options for patrons with digital television screens for repose entertainment.

4.6.3.2 Hall geometry/capacity

The theatre has five cinema halls with all being available for use by the patrons. The halls are labelled one to five each with a different seating capacity. All the halls are rectangular shape in floor plan layout with the screen being located on the shorter side with rows being arranged transversally with respect to the screen.

<u>Hall 1</u> also called Atmos Hall is the first cinema hall with 12 rows from row A to row L. Row A to row H having 15 seats, row I to row K having 17 seats each and row L having 21 seats. This brings the total capacity the hall supports to 192 patrons.

<u>Hall 2</u> also called VIP Atmos is the second cinema hall with 6 rows from row A to row F. Row A to row F having 8 seats each. This brings the capacity the hall supports to 48 patrons. The treatment of the Atmos VIP hall is far different from the rest of the halls. The wall surfaces have been finished in timber slats and the seats are made of leather for additional comfort as shown in fig 4.82 and fig 4.84.



Fig. 4-76 Cinema Hall 4 upholstered seats and floor finish in carpet. Source: Author



<u>Hall 3</u> is the third cinema hall with 9 rows from row A to row I. Row A having 9 seats, row B to row H having 11 seats each and row I having 13 seats. This brings the capacity the hall supports to 99 patrons.

<u>Hall 4</u> is the fourth cinema hall with 8 rows from row A to row H. Row A to row G having 13 seats and row H having 15 seats. This brings the capacity the hall supports to 106 patrons.

<u>Hall 5</u> also called Century IMAX is the fifth cinema hall with 11 rows from row A to row K. Row A having 15 seats, row B to row H having 21 seats and row I & row J having 23 seats each and row K having 27 seats. This brings the capacity the hall supports to 235 patrons. This cinema hall is an IMAX hall fully certified by IMAX international.

The author was allowed to take measurements of the Cinema Hall 2 which has the smallest capacity and the hall dimensions are 9,000mm depth by 11,000mm length and a height of 7,500mm and the Century IMAX Hall which is the biggest with hall dimensions being 17,000mm depth by 22,000mm length and a height of 9,600mm; this is demonstrated on the sketch provided in fig 4.83, fig 4.84 and 4.85.

4.6.3.3 Service spaces

This includes audience amenities that maximize customer experience in the facility. The typical amenities include the lobby, washrooms, ticket and concession stands.

<u>Lobby</u>: - The lobby for Century Cinemax Garden City is approximately 10,000mm at the widest point by 20,000mm length with a soffit level of 5,800mm. This is demonstrated on the sketches provided. The lobby has one ticket and concession stand that is split into different stations that cater to the patrons aptly labelled. The lobby area provides a lot of seating and space for patrons as they wait for their screening which is a plus in the service quality.

Ticket & Concession stand: - The theatre has one ticket and concession stand that is split into different stations that serve the patrons. The stations are all equipped with automated ticketing machines that accept cashless transactions as well as cash transactions with the option of



Fig. 4-78 Century Cinemax Garden City IMAX Hall with aesthetic lighting on display. Source: Author



Fig. 4-79 Cinema Hall 2 also called VIP Atmos Hall seating layout and wall articulation. Source: Author

patrons choosing the seats that they want instantaneously. The stations also provide choice of snacks that patrons can buy before and after the screening.

<u>Washrooms</u>: - There are two washrooms accessed from the lobby that serve the patrons and staff on the theatre. The two are delineated for the two sexes with wash hand basins and stalls inside.

4.6.3.4 Accessibility

<u>Crowd control</u>: - Century Cinemax Garden City has implemented the holdout line which prevents ticket holders for the next showing of that movie from entering the theatre until their particular auditorium has been cleared out and cleaned. Ticket holders may be enticed to shop or eat in the diverse retail and culinary options in the Garden City complex while waiting for their screening. The lobby area has adequate space and seating options for patrons with digital television screens for repose entertainment.

<u>Security & Safety</u>: - Security guards are stationed at the ground floor entry points and serve the entire business ventures in the complex as opposed to being responsible solely for the theatre. The theatre has 20 staff members that provide appropriate customer service throughout the facility. Fire safety has been considered inside the lobby with easily visible signage and fire fighting cylinders located visibly. The safety of residents and visitors is paramount to Garden City Management with a full security system in place throughout the project, guards and there is an independent security manager on site for the complex.

<u>Universal Access</u>: - The lobby is accessible by wheelchair from the elevator and the halls are also accessible by wheelchair due to absence of steps in the hall entrances. The wheelchair access ends in the different auditorium halls though as the back rows aren't accessible. There exists stairs and steps that serve only the able bodied patrons and inhibit universal access. The circulation spaces are adequate for movement both inside the halls and outside the halls for both able-bodied and the less able-bodied patrons.



Fig. 4-80 Depiction of Lobby seating area, showing seating options, floor and ceiling treatment. Source: Author

4.6.4 Building Technology 4.6.4.1 Floors

The ground floor arcade entry is a concrete floor slab finished with 600mm square ceramic floor tiles. The structural floor at the theatre level is also a concrete floor slab finished with 600mm square ceramic floor tiles which extends to most of the areas on the theatre level. The entry/exit points are carpeted with dark coloured fabric and this finish is extended into the different halls which are also carpeted fully on all floor surfaces.

4.6.4.2 Walls

The basic structure of the Garden City complex building is reinforced concrete structure with masonry stone, steel and curtain walls. The lobby walls are all finished in gypsum in colours thematic with the ambience of the space also with display boards for advertisements hung on the walls. The washrooms are finished in glossy ceramic wall tiles to reflect light and add luminance to the spaces. The five cinema halls are padded in dark coloured carpet for non-reflectivity on all the four walls that absorb sound to prevent echo.

4.6.4.3 Ceiling

The soffit level at the lobby is finished in painted gypsum boards and bulkheads that have apertures for downlighters with LED strip lighting on the vertices. The soffit provides a double volume inside the lobby. Inside the hall, the structure is made of steel trusses and covered with gypsum acoustic ceiling boards that are dark coloured. The hall ceiling is also innervated with HVAC vents that regulate the internal temperature of the hall.

4.6.5 Technology

4.6.5.1 Screen

The screens at Century Cinemax Garden city theatre are distinct ranging from the biggest which is in Hall 5 to the smallest in Hall 2. The screen in Hall 2 is 7,500mm by 4,000mm which is slightly over 24 feet wide by 13 feet high and the screen at Hall 5 is 16,000mm by 9,500mm which is slightly over 52 feet wide over 30 feet high. All the screens in the theatre stretch over the frontside walls of their respective halls. The traditional IMAX screen was slightly curved and typically 16,000mm high by 22,000mm wide which is about twice the area of the IMAX screen in Hall 5.



Fig. 4-81 Depiction of Century Cinemax IMAX screen sixe in hall 5. Source: Author

The IMAX screen is a silver lenticular screen, white in colour and made of fabric mounted on steel framing and stretched for the whole length and height of the frame to achieve tautness. All the five screens are capable of both 3D and 2D viewing and provide for patrons.

4.6.5.2 Sound

The sound system in Century Cinemax Garden city theatre is both Dolby Atmos provided by Dolby Laboratories Incorporated and IMAX. Dolby Atmos is provided for four halls and IMAX Sound for one hall.

Dolby Atmos is an audio technology format that supports 128 audio tracks plus associated spatial audio description metadata to be distributed to audio objects as opposed to the common audio channel configurations that first allowed and popularized surround sound. The Dolby Atmos audio tracks can be assigned to an audio channel, which is the commonplace format for distribution which by default has a 10-channel system setup to deliver theatrical surround sound for four of the halls in the Century Cinemax Garden City theatre.



Fig. 4-82 Depiction of Speaker placement in the VIP Atmos Hall that has Dolby Atmos surround sound. Source: Author

IMAX provided its relatively new 12-channel surround sound system in this joint venture with Century Cinemax in the Century IMAX Hall because it has a proprietary on immersive sound format in all its theatres. The surround features double the number of channels that the previous IMAX system offered. It features new side and overheard channels that deliver greater dynamic range and precision for the ultimate in audio immersion. Out of 12 audio channels, 7 of them are intended for the base level and 5 for above. Unlike Dolby Atmos the IMAX format is entirely channel-based and does not use audio objects. The 12 channels include sub-bass, and additional side channels as well as new overhead channels that improve the audio system's ability to position sounds around the audience and further ensure every seat is the best in the hall.

All the halls have speakers that have a wide dynamic range with a low frequency response that goes down to about 40 Hz for the Atmos system halls and 23Hz for the IMAX hall. Most standard cinema theatres are fitted with 8,000 watts, while the four out of five Century Cinemax Garden City theatre halls have 10,000-12,000 watts sound system. The Century IMAX Hall is fitted with a 15,000 watts sound system different from the other halls.





Fig. 4-83 The layout of Century Cinemax IMAX Hall. Source: Author



Fig. 4-84 The wall articulation and finish inside the VIP Atmos Hall. Source: Author

4.6.5.3 Lighting

Lighting has been used at Century Cinemax Garden city for general illumination necessary for public safety, way-finding and it serves a crucial role in creating excitement and eliciting emotion for patrons too.

4.6.5.4 Projector

The projector technology system in use at Century Cinemax Garden City is the digital projection system with Barco Company digital projectors for all the halls. The theatre has four Digital Cinema Initiative compliant 2K resolution Xenon projectors one for each hall and one Digital Cinema Initiative compliant 4K resolution Xenon projector that make motion picture experience very immersive. All the Digital projectors have the dual projection setup that enables superimposition of the output onto each other with half a pixel offset resulting in a higher perception of overall resolution and even better contrast. The Barco's 4K digital cinema projectors are the first to show 4K movies at 60 frames per second and 4K 3D content on a single projector.

4.6.6 Ergonomics & Sensorial factors

These are factors that directly affect the patrons in the Motion-Picture spaces and their comfort in the spaces. The ideal acoustic environment in an auditorium is one where the visual and auditory experiences are captivating, intimate and efficient.

4.6.6.1 Seating layout

The seating layout at Century Cinemax Garden City for all of the halls is a modified continental seating layout with aisles on particular ends as shown in the sketches provided.

Stadium seating is in use in the halls at Century Cinemax Garden City. This gives patrons a clear sight line over the heads of those seated in front of them. Intimacy, the shared experience and audience enjoyment are significantly impacted by the relationship of seats not only to the screen, but also to each other. The seats are numbered individually and arranged in rows each seat with armrests that demarcate the seating area.



Fig. 4-85 Sketch section of the Century Cinemax IMAX Hall. Source: Author



Fig. 4-86 Sketch section of the Century Cinemax IMAX Hall. Source: Author

4.6.6.2 Floor Raking

The Stadium seating has been modified in the IMAX auditorium because of the very tall screen in Hall. Because of the angle of rake of the seats from the stage all the way to the back row, the aisles have steps. The floor to ceiling height from row A being 10,200mm and the floor to ceiling height from row K being 5,850mm in Cinema Hall 5 for example. The aisle steps are 150mm high for the risers and 300mm for the treads. The sketch provided in fig 4.85 depicts the findings. The seating is steeply pitched at about 26.5 degrees.

4.6.6.3 Sightlines

The step-down between the rear and the front seats in the Cinema Hall 5 is fairly deep approximately 4,650mm and this provides uninhibited sightlines for all patrons from their seats all the way to the screen at the front. The last row at the back of the row is slightly staggered from the immediate row in front of it to further enhance the sightlines as shown in fig 4.83, 4.85 and fig 4.86.

4.6.6.4 Tactile

<u>Wall surfaces:</u> - The carpeted wall surfaces inside the auditorium hall are rough and ribbed and the draperies are soft to absorb echoes while the film is screening.

<u>Floor surfaces</u>: - The floor finish is carpet that is also rough for better absorption of noise inside the auditorium.

<u>Seats</u>: - The seats are upholstered in smooth fabric for the patron's comfort and also for absorption with exposed plastic cup holders for utility.

<u>Temperature</u>: - The technical team at Century Cinemax Garden city theatre keep their auditorium halls and the projection room between 23-25 degrees Celsius. However, the internal temperature can be regulated based on the outside temperature. The hall is able to cool down after screening because of high ceilings that allow heat to escape to the top through mechanical vents.









Fig. 4-88 Depiction of Dolby Atmos surround sound layout vis-à-vis 7.1 and 5.1 surround sound layouts.

Source: https://www.extremetech.com/extreme/178670-dolby-atmos

4.6.6.5 Visual

<u>Screen</u>: - There are five functional screens at Century Cinemax Garden City theatre designed to make the audience feel like they're part of the immersive experience. The screen at Hall 5 is 16,000mm by 9,500mm which is slightly over 52 feet wide over 30 feet high. All the screens provide razor sharp images when displays are projected upon them.

Lighting: - There's functional lighting provided on each step in the aisles is outlined with small LED strip lights to prevent patrons from tripping in the darkened theatre. There's also wall sconce lighting that is thematic with the interior design of the Century Cinemax Garden City theatre. There are concealed LED lights and recessed can lights also provided in the lobby soffit for ambient lighting.

4.6.6.6 Auditory

Century Cinemax Garden City uses both the Dolby Atmos Sound technology and IMAX sound technology. Dolby Atmos introduces the idea of object-based sound design instead of having fixed waveforms that are recorded and fixed by the audio engineer, the process of audio production instead becomes a 3D map of sound objects moving through space which allows the same source soundtrack to be used in theatres with different numbers and placements of speakers.

The combination of perfectly tuned integrated sound system and the precise speaker orientation ensures the auditory experience has been bolstered to the point of patrons being able to detect a wide variety of sounds for example, an immense explosion, a whisper heard over your shoulder and the rumbling bass you feel instead of hear. All the halls in the theatre have been customized for an optimal experience. Furthermore, all the five halls have specific speaker placements and soundproofing for optimized hearing and employs the most whisper-quiet air conditioning possible and they remotely optimize the various speaker outputs.

4.7 Comparative Analysis

A comparative analysis of the case study parameters summarises the chapter and comparisons are based on the fieldwork undertaken.

CINEMA THEATRE	ANGA IMAX	ANGA SKY Panari	ANGA DIAMOND	Century Cinemax Junction	Century Cinemax Garden City	Comments	Recommendations
Location	Along Mama Ngina St. Starehe Constituency C.B.D	Along Mombasa Road Embakasi South Constituency	Along Pramukh Swami Avenue Westlands Constituency	Along Ng'ong Road Dagoretti North Constituency	Along Thika SuperHighway Kasarani Constituency	All the examined Motion picture spaces are located near major roads.	Location along or close to major routes of circulation increases chances of attendance from the patrons and should be prioritised.
Officially opened	March 2012	May 2015	March 2018	January 2012	November 2016	Theatre chains are continually adding more branches within the county.	Branching out into untapped areas within Nairobi or the larger metropolitan area.
No. of Cinema Halls	1 Hall	2 Halls	3 Halls + 1 Hall yet to be completed	4 Halls	5 Halls	None of the examined cases can be accurately classified as multiplexes because they all have less than six screens, which is considered the minimum in the strict sense of defining the term.	A multiplex with six or more screening halls in line with the definition of the term.
Capacity of Halls	1 Hall – 279 persons	Sky Hall – 206 persons Dream Hall – 206 persons	Sky Hall – 111 persons Diamond Hall – 128 persons Dream Hall – 112 persons	Hall 1 – 110 persons Hall 2 – 196 persons Hall 3 – 134 persons Hall 4 – 182 persons	Atmos Hall – 192 persons VIP Atmos Hall – 48 persons Hall 3 – 99 persons Hall 4 – 106 persons Century IMAX Hall – 235 persons		
Service spaces	Lobby concession stand, Bar, WC's	Lobby concession stand, Lounge, WC's	Lobby concession stand, Lounge, WC's	Lobby concession stand, Lounge, WC's	Lobby concession stand, Lounge, WC's	Theatres should add more service spaces for repose to boost the attendance.	Theatres should diversify the leisure options they can offer patrons to remain viable.
Geometry of Examined Hall	Hall:- length 19,800mm width 12,800mm Height 9,300mm	Sky Hall:- length 15,000mm width 13,800mm Height 8,000mm	Diamond Hall:- length 15,000mm width 11,500mm Height 7,600mm	Hall Two:- length 17,000mm width 10,500mm Height 7,500mm	Century IMAX Hall:- length 22,000mm width 17,000mm Height 9,600mm	The hall dimensions are entirely dependent on the target number of viewers and space available to the client(s) for use.	
Temperature	22-23 degrees Celsius	20-23 degrees Celsius	20-25 degree Celsius	20-25 degree Celsius	23-25 degree Celsius	The average temperature maintained in the cinema halls is 23 degrees Celsius.	The average temperature should be maintained for user comfort.

CINEMA THEATRE	ANGA IMAX	ANGA SKY Panari	ANGA DIAMOND	Century Cinemax Junction	Century Cinemax Garden City	Comments	Recommendations
Layout of Examined Hall	Only Hall	sreen svy Hall Sky Hall		A C C C C C C C C C C C C C C C C C C C	Century Cinemax	All the examined Motion picture spaces Have some form of modified continental seating which has aisles on the ends as opposed to multiple-aisle which has aisles in the middle of the seating layout. This has provided more seating space for seats that would have been lost had the aisles been in the middle of the layouts. The layout is also dependent on the seating capacity targeted by the client(s).	Variations of the continental seating should be prioritised in design of cinema auditoria.
Universal Accessibility into Hall(s)	Very limited, access into hall is stepped.	Limited, access into halls is stepped.	Accessible	Accessible	Accessible	Universal access has not been fully realized in the cases examined.	Promote universal access, seating options & egress.
Projector Technology used in the Theatre	BARCO 2K resolution Xenon projector	BARCO 2K & 4K resolution Xenon projectors	BARCO 2K & 4K resolution Xenon projectors	BARCO 2K resolution Xenon projectors	BARCO 2K & 4K resolution Xenon projectors	BARCO company is the leading supplier for Cinema projectors in the case studies.	
Seating Layout Section of Examined Hall	Modified continental seating 11.05° & 18.43° rake	Modified continental seating, 9.46° rake	Modified continental seating, 15° rake	Modified continental seating, 9.46° rake	Modified continental seating, 26.57° rake	Steeper seating rakes provide for better uninhibited angles of view for the viewer with the ones above 25 degrees providing the ideal comfort field of view of 30 degrees either up or down the horizontal eye level.	Prioritise steeper seating rakes for better uninhibited fields of view for patrons using the cinema auditoria.
Sound Technology used in the Theatre	IMAX 6-Channel surround sound	Dolby Digital Dolby Surround 7.1	Dolby Digital Dolby Surround 7.1.2	Dolby Digital Dolby Surround 7.1	Dolby Atmos surround sound IMAX 12-Channel surround sound	Dolby Atmos & IMAX 12-Channel are the top surround sound technologies presently.	
Screen size in examined hall	Approx. 17,000mm by 7,300mm	Approx. 9,600mm by 5,500mm	Approx. 10,500mm by 6,500mm	Approx. 9,200mm by 5,600mm	Approx. 16,000mm by 9,500mm	The bigger the screen size, the better the suggested immersive experience.	Consider screen sizing as a way of creating suggested immersive feel.

CINEMA THEATRE	ANGA IMAX	ANGA SKY Panari	ANGA DIAMOND	Century Cinemax Junction	Century Cinemax Garden City	Comments	Recommendations
Floor & wall finishes Inside examined						Acoustical materials have to be prioritised to ensure the halls are acoustically suited for the movie surround sound.	Use acoustical sound finishes for the walls to avoid echoes. Ambient lighting should be soft with lower lumen outputs than typical
hall						A successful design should elicit an emotional human connection to the	lighting. Auditoria colour can also play a role in this area of movie theatre lighting with most theatres opting for
	Carpet fabric	Carpet fabric, Ceramic Tiles	Carpet fabric	Carpet fabric	Carpet fabric	space and artificial lighting plays a crucial	blue toned lights or yellow
	Carpet fabric	Carpet fabric, Drapery	Carpet fabric	Carpet fabric	Carpet fabric		toned lights.
Cross-section of examined hall	699 00F8 12800		Diamond Hall Auditorium	0595 0595 0595 18000 1550			
Screen Technology in examined hall	 Silver lenticular screen, vinyl 3D exhibition capability 3D glasses provided for rent 	 Silver lenticular screen, vinyl 3D exhibition capability 3D glasses provided for rent 	 Silver lenticular screen, vinyl 3D exhibition capability 3D glasses provided for rent 	 Silver lenticular screen, vinyl 3D exhibition capability 3D glasses provided for rent 	 Silver lenticular screen, vinyl 3D exhibition capability 3D glasses provided for rent & purchase 	Silver lenticular screens are ideally suited for modern polarized 3-D projection.	
Auditory range in examined hall	23Hz – 20,000Hz	40Hz – 20,000Hz	40Hz – 20,000Hz	40Hz – 20,000Hz	23Hz – 20,000Hz	The human audible range of 20-20kHz is covered adequately within the case studies.	Maintain the human audible range of 20-20kHz.
Sound wattage in examined hall	12,000 Watts sound system	10,000 Watts sound system	12,000 Watts sound system	10,000 Watts sound system	15,000 Watts sound system	The higher the power (watts) the louder and cleaner the speakers will play sound.	



CONCLUSION & RECOMMENDATIONS

No matter where a film is made -if it's of archetypal quality, it triggers a global and perpetual chain reaction of pleasure that carries it from cinema to cinema, generation to

generation.

Robert Mckee
5.1 Introduction

This final chapter on conclusions and recommendations will show how the objectives have been met. This will be done by forming opinions based on the synthesis of the critical review of literature carried out in Chapter 2 and the findings from the investigations in Chapter 4. The study has observed the evolution of Motion Picture since its inception and tried to look at the trends in the sector and the experiential aspects. The author chose five local case studies under the major cinema chains in the county ANGA Cinemas and Century Cinemax Cinemas which helped the author research on the Motion Picture spaces and experience. As a result, several conclusions are drawn from the research findings.

5.2 Chapter Conclusions

5.2.1 Chapter 1 The chapter begins with a brief background asserting the past and current state of the subject, followed by a brief explanation of the research problem. Consequently, research questions of the study are stated, leading to the formulation of the research objectives. Accordingly, the author justifies the research, states its significance and highlights the scope and limitations. The chapter concludes with the organisation of study and a definition of terms used in the study.

5.2.2 Chapter 2 The second chapter formulates a foundation of the study through the examination of various literature on Motion Picture in general. It begins with a history of Motion Picture and expounds on the development over time. In the second part, it establishes factors to consider when designing rooms for cinema and the issue of noise control in terms of acoustic defects and acoustical materials. To ground the study, it discusses the most critical factors that influence the design of cinema auditoria which help in creating a guideline to evaluate selected case studies.

5.2.2 Chapter 3 Founded on the insights from the literature review in the second chapter, this chapter outlines the research methodology to be employed to answer the research questions outlined in the first chapter. The selected research approach is the case study based approach. This chapter also provides a breakdown on the criteria for selecting the case studies, as well as the criteria upon which they will be evaluated. Additionally, it explains the data collection and data presentation methods that will be used before highlighting the time horizon of the study.

5.2.2 Chapter 4 Based on the established guidelines from the literature review in the second chapter and the set research methodology in the third chapter, this chapter examines the local case studies based in Nairobi. The fourth chapter investigates all the selected local case studies to determine what they've done and comparatively analyses how them across the board. The findings of the fieldwork by the author are reported herein.

5.2.2 Chapter 5 The final chapter answers the research questions by concluding the topic of study. The conclusions drawn highlight the analysis of the selected cases studies and the global standards that are employed. This formulates issues and factors that promote human sensorial comfort in the motion picture spaces. Finally, the chapter highlights possible fields of study to which it recommends further research to be carried out by interested parties in the future.

5.3 Conclusions based on Objectives

5.3.1 Objective 1

The exploration of the emerging trends in motion picture theatres and experience and the consequent developments was the first objective.

As far as this objective is concerned, it is conclusive that motion picture experience and the theatres therein are synonymously linked to the development of technology and the articulation of the spaces that exhibit the motion pictures. From the illusion of motion based on the optical phenomenon known as persistence of vision and the phi phenomenon to the initial projection of 16 frames per second for silent films and even the virtual space being explored at the moment, the experience for the patron has been evolving over time. It is also found that the trends in the industry were improvements and developments on what already existed as opposed to having completely foreign concepts. The simple concept of moving images and storytelling has remained at the core of motion picture as everything else has morphed and evolved to enhance just that.

5.3.2 Objective 2

An analysis of the impact of these trends on the spatial arrangement and planning of motion picture theatres in Nairobi.

An analysis of the case studies within the Nairobi County was employed to determine how Motion picture spaces and the general experience in the spaces had influenced each other in the arrangement and planning principles in the design. It was revealed that the design of these spaces were more in line with attraction of prospective patrons and their perpetual loyalty to ensure the spaces became profitable. The design of most of the examined cases was focused more on the visual and haptic aspect of attraction with less emphasis on the motion picture space as an avenue for social interaction themselves which was more pronounced in the older era of motion picture exhibition.

5.3.3 Objective 3

To derive lessons and give recommendations that can be learnt in the design of motion picture theatres for enhanced user experience in the modern era.

As gathered from the literature reviewed both represented in the second chapter of this study and also from literature not represented there, it is notable that design of motion picture spaces in the modern age must adapt to provide a wider array of options for the patrons. For audiences, the style and design of a Motion picture theatre or cinema must be aimed at making the theatre or cinema visit an unforgettable experience. Motion picture theatres also have very specific functional design requirements apart from the aesthetic design requirements and getting this right is an essential part of developing a facility that audiences will enjoy. The recommendations will be explored later on in the chapter.

5.4 General Conclusions

Based on the findings in this study and the subsequent conclusions based on the objectives, the author makes the following general conclusions regarding the design of motion picture spaces for better experience for the users.

5.4.1 Growth and change in the industry

Growth and change of the motion picture industry is inevitable. The growth is attributed to the increase in popularity and significance of leisure in the new urban society and advancement in motion picture technology that pushes the boundaries of experiential nature of this leisure type. The examined cases in Nairobi provide this opportunity but lag when compared with the international stage.

5.4.2 Increased functional, leisure & societal demands of the Motion Picture spaces

The modern motion picture space has a tougher time than it did in the previous decades. The era of the standalone cinema ended because of its static nature and lack of diversifying in terms of leisure. Of course, the yearn for the cinema experience does still endure, but the market space is now shared with specialized exhibition venues such as the US-based Alamo Drafthouse and the UK's Picturehouse, which cater to niche & cult audiences and offer an alternative experience to the traditional multiplex cinemas. Again, motion picture streaming sites are thriving in the modern age requiring the cinemas to evolve and diversify to still maintain their appeal. Also, kids nowadays are involved in motion picture exhibition as the industry continually channels motion picture targeted for them, hence provision of a kids oriented design will come in handy. Modern motion picture spaes should have a variety of functions and activities such as recreation, commercial and entertainment to attract more people to use the complex.

5.5 Recommendations

From the findings obtained from the case studies and the literature reviewed on the Motion Picture and the spaces therein towards the enhancement of overall user experience in the facilities, it is discernible that there needs to be a more user-oriented approach to the design. Based on the findings in this study and the subsequent conclusions based on the objectives and general conclusions, the author draws a few recommendations that can be incorporated in the design of Motion Picture spaces towards providing a wholesome user experience for the staff, the patrons and everyone else.

5.5.1 Interior Design Aesthetic

In the interior design approach the designer has to create designs that are easy to recall, easy to relate to, easily portrays the brand in a concise and accurate manner. Again at the back of the design, the need to evoke the right and positively associated emotions which may range from feelings of security to feelings of nostalgia is very crucial. In colour aesthetic selection for example, the designer should select colours that evoke the intended positive feelings in the user. This can be achieved by the use of bright yellow for example if the intended emotion is cheery or orange for an energetic warmth feeling or shades of blue for calm or serenity if intended. The materials and furniture used should also create that desired feel in the design.

5.5.2 Lighting

Light here includes both natural and artificial lighting. The designer should target the provision of natural light in the other service spaces seeing as the auditoria and projection rooms require only artificial light. Natural light has been theorised to have more impact in terms of provision of positive user experience. This can be provided by creating provisions for daylight penetration via domes, clerestories and skylights; increasing reflectance properties within spaces through the use of light coloured wall and ceiling finishes, sloping ceilings away from fenestrations and orienting the building in a manner that maximizes on exposure to light but curbs solar insolation. A successful design should also elicit an emotional human connection to the space and artificial lighting plays a crucial role in accomplishing this goal. Going to the movies should be an experience from start to finish and a few considerations must considered to ensure a pleasant movie-going experience for their patrons.

5.5.3 Control

Control in this regard involves noise control, visual control and social control. Noise control and curbing is addressed through spatial disposition on site where the Motion picture space is being constructed with regards to its context. Inside the spaces, use of acoustical materials has to be prioritised to ensure the halls are acoustically suited for the movie surround sound. The other support spaces in the theatre can also employ noise control with regards to the sound privacy gradient required.

Visual control is addressed by considering sightlines for every seat inside the Motion picture spaces and the screen itself. Man has a horizontal view of 180 degrees meaning one can perceive things from the far right to the far left. The central view/front view spans across only 10 degrees but we still have the ability to see across the remaining 175 degrees on either side. The human eye starts to detect motion clearly after a 30 degrees view on either side which should be considered when determining the visual liberty the auditorium seats provide with regards to the screen dimensions.

Social control is addressed through spatial location and privacy gradient intended for the facility. The more sequestered spaces like the VIP lounge for instance should be located away from the more public spaces maybe even on a different floor. Some of the areas require a certain amount of privacy while simultaneously allowing socialisation which should also be considered in the design. The staff should also be considered and have private spaces where they can rest and relax for instance, a staff break room.

5.5.4 Way-finding

This involves appropriate signage, use of materials, visual interest and spatial layout. The signage used should be legible and easily understood by patrons of all ages. Floor signage can also be incorporated to supplement wall signage as it can be easily visually accessed by any kind of user. The layout of the facility should also be as legible and simple as possible. Dynamism in wall, floor and ceiling material should be intentionally used, for example, to indicate a change in space use e.g. from circulation to seating space. Objects and elements of visual interest should be introduced at circulation points or at other areas with high traffic to act as landmarks for easier way-finding.



Fig. 5-1 Depiction of horizontal field of view for a person. Source: Human anatomy & physiology-pearson/design: nural choudhury



Fig. 5-2 Depiction of vertical field of view for a person. Source: Human anatomy & physiology-pearson/design: nural choudhury

5.5.5 Visual & haptic stimulation

With the aim of creating an experience, the immediate surroundings of the users should contain a moderate level of physical stimulation which creates positive feelings, holds their attention without being too loud and hence holds back negative associations. This can be attained via the careful combination of the design elements and involving nature in the design.

Direct access to nature can be provided via the incorporation of both outdoor and indoor greenery in the form of courtyards, gardens, exterior repose and waiting areas, etc. Indirect access can be provided via selection of a site with bountiful views, orienting the buildings fenestrations towards these views and carefully arranging the internal spaces. Introduction of public art or murals or sculptures are also essential to the creation of surreal spaces and experiences that are easily memorable and invoke repeat visits from patrons. The pieces can also act as landmarks and create platforms where people can meet, gather and socialize.

Movie theatres set their heating, ventilation & air conditioning systems to lower temperatures with the idea of a large amount of body heat being emitted by patrons. Patrons have a preference for cooler cinema halls to prevent sweaty bodies that promote discomfort. Again, it has been proven that individuals tend to be more alert when they are in environments with a colder temperature.

5.5.6 Technology

The world in the 21st century is in constant flux and is mostly driven by technological forces. It is important that the designer provides for this flux if possible and also provide the users of the Motion picture spaces with the current technological that is available on the global level. The Motion Picture space should be able to adapt and incorporate new trends in technology for efficiency and for the well-being of the users.

5.6 Recommendations for Future Work

The author's study focused on the Motion Picture experience and the selected Motion Picture theatres in Nairobi County which is relatively referred to as the "Big Screen". With this in consideration, research can also be conducted focusing on the "small screen" and how the

evolution of the Television has impacted the society along with the experience associated with it. This will yield a further understanding of the visual media that has changed visual entertainment for man.

5.7 Summary

The significance of leisure in the new urban society is to the extent that it is termed as the fourth part of human activity after agriculture, industry and services and it is known as the characteristic of coming communities. Among the many facets that provide for human leisure is the cinema. It is the place that provide for human assembly for mutual audio-visual experience and human relations after the exhibitions.

It is true that home viewing has become more popular over the past two decades thanks to the advances in home theatre devices and increasing easy access to content. The rise of Netflix, Amazon and other top streaming services, is a clear illustration of this modern trend. Consumers can enjoy films from the comfort of their own homes instead of heading to theatres. That being said, the Motion picture experience is more than the actual film experience which consumers get at home.

Movie-going still holds a special place in popular culture and the arts and what the movie theatres can do to maintain their audience In face of this challenge is by redefining what movie-going experiences are supposed to be. Beyond the cushy recliners, state-of-the-art projectors and surround sound systems and full food & drink services at patrons' seat, they should also champion the notion of movie-going as a premium out-of-home entertainment option similar to going to Theatrical shows or the opera. If the experience is truly as differentiated and special, staying home will not be a viable substitute for the audience seeking a more refined experience.

Furthermore, there should be diversification of the business model to look for new sources of revenue like recreation services to give movie-goers a good reason to linger in theatres a bit longer once they get there. Recreational services such as kids' playground or arcade gaming may just be what some theatres need to establish themselves as a leisure destination and increase revenue per customer.

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Every viewer is going to get a

different thing. That's the thing

about art; painting, photography & cinema.

David Lynch

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CASE STUDY CHECKLIST

- 1. Name of the Theatre?
- 2. Theatre chain in-charge?
- 3. Date of first film premier at the theatre?
- 4. Halls :-
- Number
- Names
- Capacity
- Shape/size
- Floor material finish
- Wall material finish
- Ceiling material finish
- Screen (dimensions, technology)
- Sound system(provision, brand, wattage, frequencies, technology)
- Temperature
- Projection system (provision, brand, wattage, technology)
- 3D exhibition
- 5. Services provided apart from screening?
- 6. Staff :-
- Number
- Job delineation
- 7. Does your facility employ strategies to better the user experience in the cinema? If so, then please explain.

8. Have you employed the use of Augmented and/or Virtual Reality in your facility for the purpose of cinematic experience? If so, then please explain. If not then do you have plans to do that?

9. What are the emerging trends in motion picture experience and theatres?

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		-	-	-
RESPONDENTS' QUESTIONNAIRE				
1. How often do you go to the movies in a one month period?				
More than 5		3-4		
1-2		None		
2. You see a preview for a movie that interests you. How likely are you to rent the movie/watch it when it becomes available online over going to the				
theatre to see it?				
Very likely	Somewhat Likely	Neutral	Unlikely	Not at all likely
3. How much do you value the experience of seeing a movie in theatres over watching it at home? On a scale of 1-5 (5 being the most important and 1				
being the least important)				
5	4	3	2	1
4. How greatly does the price of seeing a movie in theatres affect your decision to attend? On a scale of 1-5 (5 being the most important and 1 being the				
least important)				
5	4	3	2	1
5. How often do you buy movie tickets online or through an app in a month?				
More than 6	4-5	2-3	Once	Don't use apps
6. How likely are you to go see a movie by yourself?				
Very likely	Somewhat Likely	Neutral	Unlikely	Not at all likely
7. What encourages you to go to the movie theatres? Check all that apply.				
Screen Size		Sound Quality		
Activity with friends or family		New Releases		
Uninterrupted watching experience		3D		
Proximity in location		Other		
8. What is your age?				
18 to 24	25 to 34	35 to 44	45 to 54	Over 55
9. What is your gender?				
Female		Male		
10. What is your favourite genre of film?				
Action	Comedy	Drama	Science Fiction	Other



Fig. 6-1 Presentation of the Respondents' questionnaire. No. of Respondents interviewed = 25 persons (5/case study) (14 female,11 male)

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