A
PROJECT REPORT
ON

"A Comprehensive Study on Technological Integration and User-Centric Design"

UNDERTAKEN AT

"MIT School of Distance Education"
IN PARTIAL FULFILMENT OF

"Post graduate diploma in management"
MIT SCHOOL OF DISTANCE EDUCATION, PUNE.

GUIDED BY
"Rajesh Raut"

SUBMITTED BY
"SAMEER BAKSHI"

STUDENT REGISTRATION NO.: MIT2022E01643
MIT SCHOOL OF DISTANCE EDUCATION
PUNE - 411 038

YEAR 2023-24
Exempt Certificate

To
The Director
MIT School of Distance Education,

Respected Sir,

This is to request you to kindly exempt me from submitting the certificate for Project Work due to the reason mentioned below:

Tick the right option
   1. As per the Rules of the Organisation
✓ 2. Self Employed
   3. Working in Public Sector
   4. Full-time Student

Thanking you in anticipation of your approval to my request.

Regards

Studet Sign: *Bakshi.*

Name:

SAMEER B

Student ID: MIT2022E01643

DECLARATION

I hereby declare that this project report entitled **"Subject Name of Project Report"** bonafide record of the project work carried out by me during the academic year **2023-20224**, in fulfilment of the requirements for the award of **"Enrolled Course Name"** of MIT School of Distance Education.

This work has not been undertaken or submitted elsewhere in connection with any other academic course.

Student Sign: - *Bakshi.*

SAMEER B

Student ID: MIT2022E01643

ACKNOWLEDGEMENT

I would like to take this opportunity to express my sincere thanks and gratitude to **"Subeer. K .B "**, Faculty of MIT School of Distance Education, for allowing me to do my project work in your esteemed organization. It has been a great learning and enjoyable experience.

I would like to express my deep sense of gratitude and profound thanks to all staff members of MIT School of Distance Education for their kind support and cooperation which helped me in gaining lots of knowledge and experience to do my project work successfully.

At last but not least, I am thankful to my Family and Friends for their moral support, endurance and encouragement during the course of the project.

Student Sign: - *Bakshi.*

SAMEER B

Student ID: MIT2022E01643

ABSTRACT

_____
The inspiration
behind this project came specifically from the spectacular success of the Caravan music device that was based on a very conventional business model but won through the product it offered to its listeners. This is a report in an ongoing process of a Realtime work and prototype development. With _Eleven prototype_ that will be available in the market testing phase by end Nov beginning Dec of 2024
Multiple working models were started and made from sketching ideation stage to a final form analysis for various kind of users

The stages that have been considered are shared below

Designing a tangible physical product for a virtual app company involves multiple stages from initial concept to final production. Here are the detailed steps:

Doodle/Initial Sketches: Rough drawings to capture the initial idea.

Concept Art: Detailed illustrations that explore the look and feel of the product.

User Research: Understanding the target audience's needs and preferences.

User Persona Creation: Creating detailed profiles of potential users.

Brainstorming: Generating a wide range of ideas.

Requirements Gathering: Defining the product requirements.

Materials Research: Identifying suitable materials for the product.

Concept Development: Refining the best ideas into feasible concepts.

Design Sketches: More detailed and refined sketches of the product.

3D Modeling: Creating digital 3D models of the product.

Mockups: Physical or digital representations of the product.

Prototypes: Creating working models for testing functionality.

User Testing: Gathering feedback from potential users on prototypes.

Design Iteration: Making improvements based on user feedback.

Detailed Engineering: Developing detailed technical specifications.

Material Selection: Finalizing materials based on testing and requirements.

Tooling Design: Designing molds and tools for manufacturing.

Pilot Production: Producing a small batch to test manufacturing processes.

This is an ongoing real time project & it is in currently in this pilot production stage of low cost manufacturing and user testing of 11 radio transistors and USB device models

*** and this prototype production in guidance with pocket fm is supported with research and pictures and details are shared at this particular phase of the development processes, after this stage we are left with mass production and quality testing just like the already successful gadget available in the Indian market called CARAVAN***

Quality Testing: Ensuring the product meets quality standards.

Mass Production: Full-scale manufacturing of the product.

This comprehensive approach ensures a well-designed and user-focused product ready for the market.

PROJECT OBJECTIVES AND SCOPE

WHY SHOULD WE MAKE A RADIO IN A
WORLD FULL OF VISUALS AND TELIVISION.
IS THIS PRODUCT GOING TO DELIVER OR IS
IT GOING TO BE A MARKET FALIUR
THE REASON AND CONVICTION IN THE
AUDIO SOLUTION TO MAKE A
SUSSESSFULL BUSINESS
THIS IS A DOCUMENT DEDICATED TO THE
FUTURE OF FM RADIO

Refer to Chapter 3 Objective and Scope of Study for
more undertail reasoning…

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

We can not know where we are going if we cant trace where we are coming from this project looks at 11 working model radio transistor gadgets as the final direction but before that lets look into the past about sound
Recent scholarship makes it clear that sound recording was invented twice: First by inventor Edouard-Léon Scott de Martinville in 1857 France,

then 20 years later by Thomas Alva Edison in the United States, Scott's phonautograph graphed airborne sound waves for visual analysis. But because it lacked the ability to "playback" its recordings, there was no proof that it actually made interpretable sound recordings. In 2008 researchers located Scott's surviving recordings. Using digital technologies, they proved Scott's recordings could be understood upon playback. This confirmed Scott as the initial inventor of sound recording and called upon historians to reexamine and reframe Edison's 1877 invention of the phonograph, a device that could both record and playback sound. Since 2008, historians have learned a great deal about Scott and his work. As a result, we now have access to a much fuller, clear picture of this history, and a better understanding of how it relates to Edison and his phonograph.

The year 2017 marks the 200th anniversary of Scott's birth. To commemorate, on April 29 Thomas Edison National Historical Park launched an exhibit at the Edison Laboratory and hosted a symposium titled "The Origins of Sound Recording."

reference page
https://www.nps.gov/edis/learn/historyculture/origins-of-sound-recording.htm

Background and History of Audio Systems:- The Origins of Sound SystemsEarly Sound Systems were created by Jamaicans who were moving back and forth from the USA in the 1940's and 50's. They were influenced by the R&B bands playing through PA systems at New York block parties and they made the idea their own by generating homemade rudimentary Sound Systems.

The phenomenon of the Sound System is firmly rooted in 1950s Kingston, Jamaica. Huge speakers, generators, amplifiers and turntables were loaded into the back of a van and transported to any neighbourhood corner to provide the soundtrack to a street party. Then there are background music system which provides sound to create atmosphere in a venue, and is usually used for music or media playback. Background music systems are used in a variety of locations, including shops, restaurants, bars and gyms. What we need to

understand is the basic that A system usually consists of ceiling or wall speakers, and an amplifier.

CHAPTER 1a : LIVE PROJECT

Based on the available information the project is documented and takes off about real time products in the making with future mass production as a possibility with industrial design manufacturing processes solutions for a known market player Pocket FM. and to make tangible portable hand held desktop and pocketable mobility gadget as well as permanent solutions for audio industry **This is an ongoing real time project & it is in currently in this pilot production stage of low cost manufacturing and user testing of 11 radio transistor gadgets and USB device models** and this is supported with pictures and details are shared at this particular phase of the development processes, after this **stage i am left with mass production and quality testing to finally deliver the outcome in the form of a over the counter purchasable gadget / product** just like the easily available and greatly successful CARAVAN audio portable device

CHAPTER 1b: OVERVIEW

Overview and Names of international Competition
& Parallel audio platforms and diverse Models.

Pocket FM
Ximalaya's and its other competitors
Wattpad
Mixcloud.
Radish
VIDIZMO.
Pratilipi
Subsplash.
Tapas
Dorian
TubeNinja.
KUKU FM
Realm
WEBTOON

Wattpad Online storytelling platform Founded Year 2006
Investors Hercules Capital, August Capital and 22 Others
Location Toronto (Canada) Tracxn Score Acquired Competitors Rank Funding
$118M

Wattpad is a writing community in which users can post articles, stories, fan fiction, and poems about anything either online or through the mobile application. The content includes work by undiscovered writers, published writers, and new writers. Users can comment and like stories or join groups associated with the website. The app is available for iOS and Android devices.

Pratilipi Provider of a vernacular platform for reading and sharing of stories Soonicorn Founded Year 2014   Investors Tencent, Brand Capital and 34 Others Location Bengaluru (India) Funding $81.1M

Pratilipi is the provider of a vernacular platform for reading and sharing of stories. It enables users to publish and read stories, poetry, essays and articles in multiple Indian languages like Hindi, Gujarati, Kannada, Malayalam and Telugu. They can also rate content posted by members. Its app is available across both Android and iOS platforms.

Tapas   South Korean online platform for comics
Founded Year 2012 Investors Korea Investment Holdings, 500 Global and 13 Others Location San Francisco (United States) Funding $6.4M
Tapas is a South Korean online platform for comics. Features a collection of various short form, English language webcomics, and webtoons. Allows comic creators to publish their comics on the platform. Also operates a mobile application to connect with the audience.

Dorian App-based storytelling platform Minicorn Founded
Year 2018 Investors March Capital, Gaingels and 19 Others
Location Walnut (United States) Funding $21.4M
App-based storytelling platform. It enables users to customize their characters
based on their choices in stories. Its app is available for Android and iOS
devices.
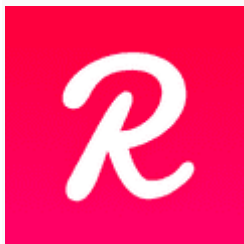
Radish Platform for user-submitted serialized fiction stories
Founded Year 2015 Investors Greylock, ACME and 26 Others
Location San Francisco (United States) Funding $66.2M
Platform for user-submitted serialized fiction stories. Writers need to apply
before being allowed to publish their content. Once verified, they can write,
share, and monetize their bite-sized serial fiction stories using a freemium
model, and earn an income from their work.

Realm Subscription-based platform for listening to podcasts
Minicorn Founded Year 2015 Investors Forerunner Ventures, Rethink
Capital Partners and 10 Others Location New York City (United States)
Funding $18.7M
Subscription-based platform for listening to podcasts. The platform allows
users to listen to podcasts on various topics like science-fiction, women,
fantasy, horror, queer, and more. It also offers a list of trending podcasts. The
app is available for Android and iOS users. It
monetizes through in-app purchases.

WEBTOON Online platform allowing users to publish comics
Founded Year 2005 Tracxn Score Location Los Angeles (United
States) Unfunded

Line Webtoon is a digital publishing platform that allows users to share and publish their comics on the platform. It allows users to publish comics under various genres including fantasy, comedy, action, romance, thriller, sports, and science fiction. Its mobile app is available for both android and ios users.

Pocket FM.

Pocket FM Overview

Timeline Details

- **Founded**: September 28, 2018
- **Growth Milestones**:
    - By 2022, Pocket FM had streamed over 45 billion minutes of content.
    - As of the latest updates, Pocket FM has raised multiple funding rounds, including a Series D, totaling approximately $196.5 million.

Management Team

- **Founders**:
    - Nishanth S.
    - Prateek Dixit
    - Rohan Nayak
    - Sanidhya Narain

Product/Service Profile Pocket FM is an audio entertainment platform offering a wide range of long-form audio series. It caters to over 100 million listeners globally, providing content across various genres such as fantasy, science fiction, romance, horror, and thriller. The platform aims to deliver a refined listening experience with engaging and diverse content.

For more detailed information, Pocket FM's website (PocketFM).

Pocket FM raises $22.4 million in Series B funding round

Pocket FM has raised capital worth $22.4 million in Series B funding round. Led by Lightspeed, the round also welcomed participation from a clutch of investors including Times Group and first-time investor in the company, Tanglin Venture Partners. The fresh capital will be utilised to scale up the operations, build the largest community of content creators, intensify its presence across geographies, invest in technology for better recommendations and strengthen the overall audio OTT category globally.

Founded in 2018, Pocket FM is now amongst the top OTT players in India that offers 100,000+ hours of enriching long-format content. Within three years, it has registered over 40 million downloads, 3 billion monthly listening minutes, and more than 110 minutes being spent by users daily on the app. It is amongst the top-ranking apps in the music & audio category on the Play Store. The company intends to surpass 100 million users in next six months.

Co-founder and CEO of Pocket FM, Rohan Nayak said: "We are building a robust ecosystem for Audio OTT with Pocket FM and its largest community of content creators. We are at a juncture where both Pocket FM and the overall audio OTT space are witnessing exponential growth. Audio storytelling has now become a mainstream content format for entertainment and our mission is to build Pocket FM as a global entertainment service provider. We are grateful to our investors for their continued faith and support in our vision and are very optimistic about the future."
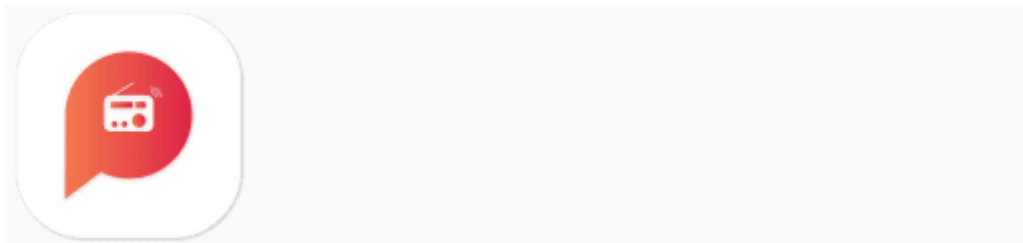
Harsha Kumar, Partner at Lightspeed, said: "We are excited to back the Pocket FM team as they scale up to build the future of audio content & are looking forward to the next phase of this incredible journey. The team has constantly innovated ahead of the curve, with multiple language offerings for their short & long form audio content and in becoming the go-to destination for audio content creators".

Expressing his views, Sankalp Gupta, Partner, Tanglin Venture Partners, said, "Pocket FM is a pioneer in the audio OTT space in India, and their approach towards democratizing audio content creation is a game-changer. The company's stellar growth trajectory, user engagement, and retention are a testament of the consumer's love for Pocket FM's product. We were blown away by the deep user insights and consumer focus put forth by Rohan, Nishanth, and Prateek and are really excited to be a part of the journey. We look forward to working with the Pocket FM team towards building a large and enduring business".

"Audio is emerging as one of the preferred mediums to consume content. It is exciting to see homegrown platforms like Pocket FM leading this innovation.

Not only have they done well in India, they are also spreading their wings globally. We strongly believe that Pocket FM will continue to lead this segment globally. We are excited to be a part of this journey" said Abhishek Mitra Gupta, Managing Partner, TVentures (backed by Times Group).

At present, Pocket FM has some of the most popular audio shows in India. With top shows like 'Ye Rishta Kaisa Hai' and 'Yakshini', that have garnered over 300 million and 100 million plays respectively. Since its inception, Pocket FM has worked towards democratizing audio creation by discovering, nurturing, and promoting new talent. Today, the platform works with a thriving community of over 17,000 PUGC writers & voice artists. Before this round, Pocket FM had raised $ 650k in seed funding round and $ 5.6 million in Series A funding round.

Pocket FM   Online platform for streaming podcasts and audiobooks Soonicorn , Founded Year 2018 Investors SVB, Tencent and 16 Others

Location Bengaluru (India) Stage Series D Funding $197M Online platform for streaming podcasts and audiobooks. It offers content for various genres such as crime, history, horror, and more. It also provides radio streaming services

Kuku FM – A Made In India Application!

Lal Chand Bisu, Vinod Kumar Meena, and Vikas Goyal, the alumni of IIT Jodhpur founded a non-music audio platform called Kukufm in the year of 2018. Kuku FM is an Indian application, a Mumbai-based platform that redefines the way people listen to the traditional radio. With the rising popularity of Internet audio platform in India, Kukufm has established a niche for itself. It has given space to the vernacular languages' content from different parts of our country to send a strong message of Inclusivity. This 'Made in India' platform shows the true spirit of unity in Diversity. The Platform works on the principle of democratizing the audio content provided in production, distribution, and marketing support to empower creators to reach to the last man standing. It helps to create a parallel discourse that is rare to find in the mainstream medium. With the expanding view of the audience, if we see, then Kuku FM is a pocket-friendly medium. Just an ordinary android phone fetch the purpose. To make the medium accessible among all the classes present in society, Kukufm comes with free of cost content for the listeners. Hence, shackling the boundaries of monitoring. Just a click away you are! Anywhere and anytime the listeners can enjoy a wide range of diverse audio content in Hindi, English, Marathi, Kannada, Bangla, and Gujarati. All the languages are

enveloped in just one platform. No longer had the listeners have to wait to listen to what they wish for. This platform encompasses the audio content in the form of long-form audiobooks, podcasts, fictional and non-fictional stories, Quizzes, and News from around the globe. If we mention the genres then, the listeners have the options to choose from the basket of genres like- Motivational, self-help, love, education, exams, business, sports, religion, Horror, thriller, crime, and cinema. As the trend of content consumption is shifting, Kuku FM caters to its listeners by providing content that is diversified, valuable, informational, entertaining, and can be consumed as they multitask regular chores or are just on-the-go. It's like fresh air in mundane life. We feel accomplished when we see our listeners happy with our cultural products. Hence, your support is our strength.

Kuku FM Mobile-based platform offering to stream radio, podcasts, and audiobooks Soonicorn Founded Year 2018 Investors IFC, Google and 58 Others Location Mumbai (India) Funding $72.3M

Mobile-based platform offering to stream radio, podcasts, and audiobooks. It allows users to stream live radio and podcast stories, talks, and news. It enables users to stream content in various languages and genres such as sports, politics, spirituality, and more. It allows them to search for broadcasting titles based on the keywords. It offers a range of features for podcasters, including in-app recording and editing, performance analytics, and community support. Creators can record and edit their podcasts within the app and view performance metrics such as listener count and audience demographics, and receive assistance from community managers.

CHAPTER 1b INTERNATIONLA MARKET STUDY

Ximalaya (喜马拉雅) CHINA

The founders of Ximalaya are Jianjun Yu, Seaman Yu, Xiaoyu Chen and Li Haibo. The Audiophile who Created China's Leading Podcast Platform, Ximalaya FM. Li Haibo is the founder of China's largest audio platform, Ximalaya FM. It possesses 73% of the audio market in China, consisting of podcasts, audiobooks, livestreaming, online radio and personal radio stations. 2019-2021. In 2021, China's largest audio platform Ximalaya reported an annual revenue of 5.86 billion yuan in its IPO prospectus. In June 2022, it suspended IPO plans for a second time in Hong Kong as investor sentiment towards Chinese internet companies remained to be somber.

monthly active users of ximalaya are 0.85 billion in USD , marking a shift from loss to profit. In terms of user base, Ximalaya had an average of 303 million

monthly active users across all scenarios and 133 million monthly active users on mobile in 2023, representing a 9.3% year-on-year increase.

People see and recognize it as an Operator of an online audio platform intended to bring audio services and music to consumers. The company's platform redefines how people produce, share and consume knowledge, information and entertainment content and provides a space where content creators and users can connect and interact conveniently with one another, providing millions of users with a voice and ability to share music, thoughts and ideas.

IT is a service website that enables users to share voices and personal radio stations. It is a product of Beijing Nali Huiju Network Science and Technology Co., Ltd. It was founded in August, 2012 and is committed to the construction and operation of online audio sharing platform.

It launched ""Ximalaya APP"" in March 2013, and in just half a year, it achieved the target of ten million subscribers. In early May of 2014, the number of activated users of Himalaya exceeded 50 million, making Ximalaya the biggest online audio sharing platform in China. On May 22, 2014, Himalayan announced that it has successfully received an A series venture capital investment of 11.5 million US dollars. As of May 2014, the Ximalaya certified audio show creators were more than 6000. Its established columns were 240000 with audio volume reaching nearly 3 million and average daily new upload audio hitting more than

Ximalaya Online platform for streaming internet radio, audiobooks, and more Unicorn Founded Year 2012 Investors Goldman Sachs, Kleiner Perkins and 25 Others Location Shanghai (China) Funding $1.25B

Online platform for streaming internet radio, audiobooks, and more. It enables users to stream music, audiobooks, and playlists on the platform. It provides various categories such as finance, IT, health, campus radio, technology, car, travel, education, movies, games, and more. Listeners have the ability to download and share on the portal. Users can search for articles based on the keywords. The app is available for iOS and Android devices.

CHAPTER 1C: HISTORY
Invention of radio

The invention of radio communication was preceded by many decades of establishing theoretical underpinnings, discovery and experimental investigation of radio waves, and engineering and technical developments related to their transmission and detection. These developments allowed Guglielmo Marconi to turn radio waves into a wireless communication system.

The idea that the wires needed for electrical telegraph could be eliminated, creating a wireless telegraph, had been around for a while before the establishment of radio-based communication. Inventors attempted to build systems based on electric conduction, electromagnetic induction, or on other theoretical ideas. Several inventors/experimenters came across the phenomenon of radio waves before its existence was proven; it was written off as electromagnetic induction at the time.

The discovery of electromagnetic waves, including radio waves, by Heinrich Rudolf Hertz in the 1880s came after theoretical development on the connection between electricity and magnetism that started in the early 1800s. This work culminated in a theory of electromagnetic radiation developed by James Clerk Maxwell by 1873, which Hertz demonstrated experimentally. Hertz considered electromagnetic waves to be of little practical value. Other experimenters, such as Oliver Lodge and Jagadish Chandra Bose, explored the physical properties of electromagnetic waves, and they developed electric devices and methods to improve the transmission and detection of electromagnetic waves. But they did not apparently see the value in developing a communication system based on electromagnetic waves.

In the mid-1890s, building on techniques physicists were using to study electromagnetic waves, Guglielmo Marconi developed the first apparatus for long-distance radio communication. On 23 December 1900, the Canadian inventor Reginald A. Fessenden became the

first person to send audio (wireless telephony) by means of electromagnetic waves, successfully transmitting over a distance of about a mile (1.6 kilometers,) and six years later on Christmas Eve 1906 he became the first person to make a public wireless broadcast.

By 1910, these various wireless systems had come to be called "radio".

CHAPTER 1cWireless communication theories and methods previous to radio
Wireless telegraphy

Before the discovery of electromagnetic waves and the development of radio communication, there were many wireless telegraph systems proposed and tested. In April 1872 William Henry Ward received U.S. patent 126,356 for a wireless telegraphy system where he theorized that convection currents in the atmosphere could carry signals like a telegraph wire. A few months after Ward received his patent, Mahlon Loomis of West Virginia received U.S. patent 129,971 for a similar "wireless telegraph" in July 1872.The patented system claimed to utilize atmospheric electricity to eliminate the overhead wire used by the existing telegraph systems. It did not contain diagrams or specific methods and it did not refer to or incorporate any known scientific theory.

Thomas Edison's 1891 patent for a ship-to-shore wireless telegraph that used electrostatic induction
In the United States, Thomas Edison, in the mid-1880s, patented an electromagnetic induction system he called "grasshopper telegraphy", which allowed telegraphic signals to jump the short distance between a running train and telegraph wires running parallel to the tracks.[8] In the United Kingdom, William Preece was able to develop an electromagnetic induction telegraph system that, with antenna wires many kilometers long, could transmit across gaps of about 5 kilometres (3.1 miles). Inventor Nathan Stubblefield, between 1885 and 1892, also worked on an induction transmission system.

A form of wireless telephony is recorded in four patents for the photophone, invented jointly by Alexander Graham Bell and Charles Sumner Tainter in 1880. The photophone allowed for the transmission of sound on a

beam of light, and on 3 June 1880, Bell and Tainter transmitted the world's first wireless telephone message on their newly invented form of light telecommunication.

In the early 1890s Nikola Tesla began his research into high-frequency electricity. Tesla was aware of Hertz's experiments with electromagnetic waves from 1889 on but, (like many scientists of that time) thought, even if radio waves existed, they would probably only travel in straight lines making them useless for long range transmission.

Instead of using radio waves, Tesla's efforts were focused on building a conduction-based power distribution system although he noted in 1893 that his system could also incorporate communication. His laboratory work and later large-scale experiments at Colorado Springs led him to the conclusion that he could build a conduction-based worldwide wireless system that would use the Earth itself (via injecting very large amounts of an electric current into the ground) as the means to conduct the signal very long distances (across the Earth), overcoming the perceived limitations of other systems.[He went on to try to implement his ideas of power transmission and wireless telecommunication in his very large but unsuccessful Wardenclyffe Tower project.

CHAPTER 1D: PHASE I

Controversy about who invented radio

 Heinrich Rudolf Hertz (1856–1894) proved the existence of electromagnetic radiation.

In an 1864 presentation, published in 1865, James Clerk Maxwell proposed theories of electromagnetism and mathematical proofs demonstrating that light, radio and x-rays were all types of electromagnetic waves propagating through free space.

 Oliver Lodge's 1894 lectures on Hertz demonstrated how to transmit and detect radio waves.

Between 1886 and 1888 Heinrich Rudolf Hertz published the results of experiments wherein he was

able to transmit electromagnetic waves (radio waves) through the air, proving Maxwell's electromagnetic theory

CHAPTER 1E: PHASE II

Audio transmission

Reginald Fessenden (around 1906)

In the late 1890s, Canadian-American inventor Reginald Fessenden came to the conclusion that he could develop a far more efficient system than the spark-gap transmitter and coherer receiver combination.To this end he worked on developing a high-speed alternator (referred to as "an alternating-current dynamo") that generated "pure sine waves" and produced "a continuous train of radiant waves of substantially uniform strength", or, in modern terminology, a continuous-wave (CW) transmitter. While working for the United States Weather Bureau on Cobb Island, Maryland, Fessenden researched using this setup for audio transmissions via radio. By fall of 1900, he successfully transmitted speech over a distance of about 1.6 kilometers (one mile), which appears to have been the first successful audio transmission using radio signals.Although successful, the sound transmitted was far too distorted to be commercially practical. According to some sources, notably Fessenden's wife Helen's biography, on Christmas Eve 1906, Reginald Fessenden used an Alexanderson alternator and rotary spark-gap transmitter to make the first radio audio broadcast, from Brant Rock, Massachusetts. Ships at sea heard a broadcast that included Fessenden playing O Holy Night on the violin and reading a passage from the Bible.

Around the same time American inventor Lee de Forest experimented with an arc transmitter, which unlike the discontinuous pulses produced by spark transmitters, created steady "continuous wave" signal that could be used for amplitude modulated (AM)

audio transmissions. In February 1907 he transmitted electronic telharmonium music from his laboratory station in New York City.This was followed by tests that included, in the fall, Eugenia Farrar singing "I Love You Truly". In July 1907 he made ship-to-shore transmissions by radiotelephone—race reports for the Annual Inter-Lakes Yachting Association (I-LYA) Regatta held on Lake Erie—which were sent from the steam yacht Thelma to his assistant, Frank E. Butler, located in the Fox's Dock Pavilion on South Bass Island.

CHAPTER 1F: PHASE III

The Regency TR-1, which used Texas Instruments' NPN transistors, was the world's first commercially produced transistor radio in 1954.

Transistor technology

The Regency TR-1, which used Texas Instruments' NPN transistors, was the world's first commercially produced transistor radio in 1954.

Following development of transistor technology, bipolar junction transistors led to the development of the transistor radio. In 1954, the Regency company introduced a pocket transistor radio, the TR-1, powered by a "standard 22.5 V Battery." In 1955, the newly formed Sony company introduced its first transistorized radio, the TR-55.It was small enough to fit in a vest pocket, powered by a small battery. It was durable, because it had no vacuum tubes to burn out. In 1957, Sony introduced the TR-63, the first mass-produced transistor radio, leading to the mass-market penetration of transistor radios.[66] Over the next 20 years, transistors replaced tubes almost completely except for high-power transmitters.

By the mid-1960s, the Radio Corporation of America (RCA) were using metal–oxide–semiconductor field-effect transistors (MOSFETs) in their consumer products, including FM radio, television and amplifiers. Metal–oxide–semiconductor (MOS) large-scale integration (LSI) provided a practical and economic solution for radio technology, and was used in mobile radio systems by the early 1970s

CHAPTER 2: ORGANIZATIONAL PROFILE

2a Organizational Profile of Pocket FM.

Timeline Details

- **Founded**: September 28, 2018
- **Growth Milestones**:
    - By 2022, Pocket FM had streamed over 45 billion minutes of content.
    - As of the latest updates, Pocket FM has raised multiple funding rounds, including a Series D, totaling MORE THAN approximately $196.5 million.
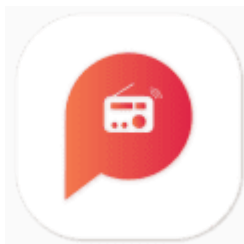
Pocket FM Online platform for streaming podcasts and audiobooks Soonicorn , Founded Year 2018 Investors SVB, Tencent and 16 Others

Location Bengaluru (India) Stage Series D Funding $197M Online platform for streaming podcasts and audiobooks. It offers content for various genres such as crime, history, horror, and more. It also provides radio streaming services

Management Team

- **Founders**:
    - Nishanth S.
    - Prateek Dixit
    - Rohan Nayak
    - Sanidhya Narain

Product/Service Profile Pocket FM is an audio entertainment platform offering a wide range of long-form audio series. It caters to over 100 million listeners globally, providing content across various genres such as fantasy, science fiction, romance, horror, and thriller. The platform aims to deliver a refined listening experience with engaging and diverse content.

For more detailed information, Pocket FM's website (PocketFM).

Pocket FM Overview

Pocket FM raises $22.4 million in Series B funding round

Pocket FM has raised capital worth $22.4 million in Series B funding round. Led by Lightspeed, the round also welcomed participation from a clutch of investors including Times Group and first-time investor in the company, Tanglin Venture Partners. The fresh capital will be utilised to scale up the operations, build the largest community of content creators, intensify its presence across geographies, invest in technology for better recommendations and strengthen the overall audio OTT category globally.

Founded in 2018, Pocket FM is now amongst the top OTT players in India that offers 100,000+ hours of enriching long-format content. Within three years, it has registered over 40 million downloads, 3 billion monthly listening minutes, and more than 110 minutes being spent by users daily on the app. It is amongst the top-ranking apps in the music & audio category on the Play Store. The company intends to surpass 100 million users in next six months.

Co-founder and CEO of Pocket FM, Rohan Nayak said: *"We are building a robust ecosystem for Audio OTT with Pocket FM and its largest community of content creators. We are at a juncture where both Pocket FM and the overall audio OTT space are witnessing exponential growth. Audio storytelling has now become a mainstream content format for entertainment and our mission is to build Pocket FM as a global entertainment service provider. We are grateful to our investors for their continued faith and support in our vision and are very optimistic about the future."*

Harsha Kumar, Partner at Lightspeed, said: *"We are excited to back the Pocket FM team as they scale up to build the future of audio content & are*

looking forward to the next phase of this incredible journey. The team has constantly innovated ahead of the curve, with multiple language offerings for their short & long form audio content and in becoming the go-to destination for audio content creators".

Expressing his views, Sankalp Gupta, Partner, Tanglin Venture Partners, said, "Pocket FM is a pioneer in the audio OTT space in India, and their approach towards democratizing audio content creation is a game-changer. The company's stellar growth trajectory, user engagement, and retention are a testament of the consumer's love for Pocket FM's product. We were blown away by the deep user insights and consumer focus put forth by Rohan, Nishanth, and Prateek and are really excited to be a part of the journey. We look forward to working with the Pocket FM team towards building a large and enduring business".

"Audio is emerging as one of the preferred mediums to consume content. It is exciting to see homegrown platforms like Pocket FM leading this innovation. Not only have they done well in India, they are also spreading their wings globally. We strongly believe that Pocket FM will continue to lead this segment globally. We are excited to be a part of this journey" said Abhishek Mitra Gupta, Managing Partner, TVentures (backed by Times Group).

At present, Pocket FM has some of the most popular audio shows in India. With top shows like 'Ye Rishta Kaisa Hai' and 'Yakshini', that have garnered over 300 million and 100 million plays respectively. Since its inception, Pocket FM has worked towards democratizing audio creation by discovering, nurturing, and promoting new talent. Today, the platform works with a thriving community of over 17,000 PUGC writers & voice artists. Before this round, Pocket FM had raised $ 650k in seed funding round and $ 5.6 million in Series A funding round.

CHAPTER 3 PROJECT OBJECTIVES AND SCOPE

OBJECTIVE OF STUDY

WHY SHOULD WE MAKE A RADIO IN A WORLD FULL OF VISUALS AND TELIVISION. IS THIS PRODUCT GOING TO DELIVER OR IS IT GOING TO BE A MARKET FALIUR

THE REASON AND CONVICTION IN THE AUDIO SOLUTION TO MAKE A SUSSESSFULL BUSINESS

THIS IS A DOCUMENT DEDICATED TO THE FUTURE OF FM RADIO

To create Portable gadget product / radio and Bluetooth internet devices

In the last decade capital worth billions of US dollars has gone into research that spans video and camera centred solutions. From the Augmented Reality Programs and Virtual Reality Headsets, social media image filters popularised by Snapchat and Instagram, to the short form content delivered as your tube short or Tik Tok Reels. Camera and Visual mediums have also grown by leaps and bounds from image processing to the revolutionary advances in Generative AI.

This has left a huge gap I another sensory medium that is as powerful as the eyes - the auditory sense.

While there have been advances in the quality or production and reproduction of sound - in the form of speakers, noise cancelling technology and overall ability to synthesise sounds, it has probably reached the limit of human ability to receive the sensory inputs generated by sound engineering.

The gap is note able in the area of content that can be consumed in an audio format. Companies neglected the audio medium because it is hard to make money in this space. The usual channels for monetising the audio experience is either music, audiobooks or the recent trend of podcasts.

3a audio experience

music,
audiobooks, the recent trend of STORYTELLING
NARRATIVE !
podcasts.

The FINANCIAL MARKET of **audio experience**

record labels
entertainment studios
aggregators using the Internet
radio stations,
theatres.

All the different mediums are delivered through either record labels or entertainment studios, aggregators using the Internet - like Spotify or YouTube, or through old economy channels like radio stations or theatres.

Recent developments point to a landscape that is going to change.

The birth and success of companies like Ximalya in China, Pocket FM and Kuku FM in India, and evolving content portfolio on platforms like Spotify and Apple Music demonstrate that people want to consume stories in the audio format. And just like the CARAVAN there is scope to produce **HARD BOX PORTABLE TECHNOLOGY WITH INTERNAL STORAGE of media and power backup for portability for Pocket FM this encouraged us to create the 11 gadgets**

They also demonstrate that our ability to multitask when it involves listening is much higher than watching something. There is reliable data to prove this, future hold the premise that we can track multiple simultaneous conversations, shifting our attention to the important ones based on the parts that are relevant. It's an innate ability and some are able to do this far better than others, but all of us have it. (Aside: I may want to research equity

traders in the earliest exchanges who used to exchange information across noisy trading floors)

The objectives of the report on **"A Comprehensive Study on Technological Integration and User-Centric Design"** are as follows:

Assess the level of awareness: The report aims to determine the extent to which the people of India and abroad are aware of POCKET FM services. It seeks to identify the knowledge and understanding of different digital apps as a platform and their functionalities among the respondents.

Analyse adoption patterns: The report aims to analyse the adoption patterns of the www users among the people of India and abroad. It seeks to understand the extent to which individuals have embraced audio systems as a preferred mode of consuming audio content

3a Designing a tangible physical product for a virtual app company involves multiple stages from initial concept to final production. Here are the detailed steps:

Doodle/Initial Sketches: Rough drawings to capture the initial idea.

Concept Art: Detailed illustrations that explore the look and feel of the product.

User Research: Understanding the target audience's needs and preferences.

User Persona Creation: Creating detailed profiles of potential users.

Brainstorming: Generating a wide range of ideas.

Requirements Gathering: Defining the product requirements.

Materials Research: Identifying suitable materials for the product.

Concept Development: Refining the best ideas into feasible concepts
.

Design Sketches: More detailed and refined sketches of the product.

3D Modeling: Creating digital 3D models of the product.

Mockups: Physical or digital representations of the product.

Prototypes: Creating working models for testing functionality.

User Testing: Gathering feedback from potential users on prototypes.

Design Iteration: Making improvements based on user feedback.

Detailed Engineering: Developing detailed technical specifications.

Material Selection: Finalizing materials based on testing and requirements.

Tooling Design: Designing molds and tools for manufacturing.

Pilot Production: Producing a small batch to test manufacturing processes.

THE PROJECT SUBMISSION REPORT FOR MIT IS AT THIS STAGE OF PILOT PRODUCTION!! THE FINAL 11 RADIOS WILL BE READY BY DECEMBER 2024

This is an ongoing real time project & it is in currently in this pilot production stage of low cost manufacturing and user testing of the radio transistor mass production and quality testing just like theCARAVANradio

Quality Testing: Ensuring the product meets quality standards.

Mass Production: Full-scale manufacturing of the product.

This comprehensive approach ensures a well-designed and user-focused product ready for the market.

Identify factors influencing and resisting the adoption of the audio systems and devices . The report aims to identify the factors that influence the adoption or resistance towards sound devices and audio industry. It seeks to explore the barriers and challenges individuals face when considering the use of a product or an app as a services.

Examine attitudes and perceptions: The report aims to examine the attitudes, perceptions, and concerns of the people It seeks to understand their views on the privacy, reliability, and convenience of portable gadgets and online app services.

Investigate demographic influences: The report aims to investigate how demographic factors, such as age, income level, and educational background, influence n awareness and adoption. It seeks to identify any variations in attitudes and behaviors across different demographic segments.

Overall, the objectives of the report aim to shed light on the current state of audio consumerism awareness and adoption in the world through various channels of acceptance, providing valuable insights and recommendations for stakeholders in the audio information entertainment or documentation and government regulatory body and other national and international players and privet sector and government policymakers to promote digital industry with the goal to support economical and financial growth and provide services effectively.

3a MEANING OF RESEARCH

Research refers to the systematic investigation and study conducted to gather information, analyse data, and gain insights about the level of awareness and understanding of audio consumption among the people of the www and other platforms across India and abroad.

Research in this report aims to explore and understand the knowledge, perceptions, attitudes, and behaviours of .It involves gathering relevant data, analysing it using appropriate methods and techniques, and interpreting the findings to draw meaningful conclusions.

The purpose of the research in this report is to assess the current state of awareness among the people about **"sound ergonomics design"**, identify any gaps or misconceptions, and provide insights and recommendations to enhance user experience and improve online and physical product based experience to the end user by providing a structured service.

The research process may involve various steps, such as:

Defining the research objectives: Clearly stating the specific goals and objectives of the research, such as understanding the level of e-banking awareness, identifying factors influencing adoption, or evaluating customer satisfaction .

Designing the research methodology: Determining the appropriate research design and methodology, which could include surveys, interviews, focus groups, or a combination of methods. Selecting a representative sample of participants from the population
Data collection: Collecting primary data through surveys or interviews, or gathering secondary data from existing sources such as reports, studies, or literature related to audio industry

Data analysis: Analysing the collected data using statistical techniques, qualitative analysis, or other relevant methods to identify patterns, trends, and insights related to the media and audio industry

Interpretation and conclusions: Interpreting the findings based on the analysis and drawing meaningful conclusions, identifying factors influencing awareness, usage patterns, challenges, and potential opportunities for improvement.

Recommendations: Providing recommendations based on the research findings to enhance day to day audio experience for end user These recommendations could include awareness campaigns, educational initiatives, improvements in sales infrastructure, or targeted marketing strategies.

By conducting research, the report aims to contribute valuable insights and recommendations that can help stakeholders, such as venture capitalists, policymakers,

and individuals, to enhance understanding a awareness and promote its benefits.

3a NEED OF THE STUDY

The need for the study on "A Comprehensive Study on Technological
Integration and User-Centric Design" arises from several factors:

Assessing Current Awareness Levels: The study aims to evaluate the existing level of awareness among the people This information is crucial to understanding the extent to which people are aware of the benefits, features, and availability of options in the region.

Identifying Knowledge Gaps: The study helps identify any gaps in knowledge or misconceptions about the people. By understanding these gaps, the report can provide insights into areas where indirect informational educational initiatives like infotainment or awareness campaigns may be needed to address the specific concerns or misconceptions about usability of audio devices .

Understanding Barriers to Adoption: The research aims to identify the factors that hinder people from adopting a different lifestyle choice and an online app service or a hand held gadget product. This may include concerns related to personal or inline account privacy , lack of access to digital infrastructure, limited understanding of the technology, or cultural preferences for traditional radio consumerism methods. Understanding these barriers is crucial to developing strategies that can overcome them and promote wider acceptance of the fm radio product adoption.

Enhancing Financial Inclusion: www and internet platform and offline portable devices have the potential to improve financial inclusion by providing unmatched services to remote corners and underserved populations. By assessing user awareness among the people, the study can shed light on the extent to which

different segments of the population, such as rural areas or marginalized communities, have access to and awareness of different audio platforms and web services. This can inform efforts to bridge the digital divide and promote cross-cultural inclusion.

Informing Policy and Decision Making: The findings of the study can be valuable for policymakers, financial venture capitalist and institutions, and other stakeholders involved in promoting this new radical form of online and offline services. the insights gained from the research can help shape policies, design targeted awareness campaigns, and allocate resources effectively to improve consumer percentage and also increase usage.

Improving Customer Experience: The study can provide insights into the specific features, functionalities, or educational resources that can enhance the customer experience and drive higher satisfaction

3a SCOPE OF THE STUDY

The scope of the report on *"A Comprehensive Study on Technological Integration and User-Centric Design"* encompasses the following aspects: Scope of the Study

The study of modern audio systems and new apps, including products like Caravan Radio, Pocket FM, Kuku FM, Ximalaya (China audio platform), internet radio, and transistor radio, aims to explore the transformation in audio consumption habits and the technological advancements that have driven this change. This scope will cover various aspects, including technological innovation, user experience, market impact, and cultural significance.

3a Objectives
Technological Evolution: To analyse the technological advancements in audio systems, including digital

streaming, smart integrations, and improved sound quality.

User Experience: To investigate how modern audio apps and devices enhance user accessibility, personalization, and overall listening experience.

Market Impact: To assess the economic implications of these innovations on the entertainment industry, including revenue generation and market expansion.

Cultural and Social Influence: To examine the role of audio platforms in community building, cultural exchange, and education.

Comparative Analysis: To compare traditional audio systems (like transistor radios) with modern digital platforms in terms of functionality, accessibility, and user preference.

Research Questions

How have technological advancements in audio systems changed user consumption patterns?

What features of modern audio apps (e.g., Pocket FM, Kuku FM) enhance user engagement and satisfaction?

What is the economic impact of digital audio platforms on the global entertainment industry?

How do modern audio platforms contribute to cultural and educational dissemination?

What are the key differences between traditional and modern audio systems in terms of user experience and market reach?

Methodology

Literature Review: Analysing existing research, articles, and market reports on audio systems and apps.

Surveys and Interviews: Conducting surveys and interviews with users of various audio platforms to gather qualitative and quantitative data on user preferences and experiences.

Comparative Analysis: Comparing traditional audio devices with modern digital platforms to highlight technological and functional differences.

Market Analysis: Reviewing market data and trends to understand the economic impact and growth potential of audio platforms.

Key Areas of Study

Technological Innovation:

Digital streaming technologies and their impact on sound quality and accessibility.

Smart home integrations and voice-controlled audio systems.
User Experience:

Personalization algorithms in apps like Spotify, Pocket FM, and Kuku FM.
Accessibility features and user interface design.
Economic Impact:

Revenue models of audio platforms (subscription, ad-based, freemium).
Market expansion and user base growth, especially in emerging markets.
Cultural and Social Influence:

Role of audio platforms in education (e.g., podcasts, audiobooks).
Community building through user-generated content and social features.
Comparative Analysis:

Functional and technological differences between transistor radios and modern digital audio devices.
User preference shifts from traditional radio to internet-based audio platforms.
Expected Outcomes
Comprehensive Understanding: Gain a detailed understanding of the technological, economic, and cultural aspects of modern audio systems and apps.
User Insights: Provide insights into user preferences and experiences with various audio platforms.
Market Trends: Identify market trends and growth opportunities in the audio entertainment industry.
Policy and Development Recommendations: Offer recommendations for further development and policy-making in the digital audio sector.
Conclusion
This study aims to provide a holistic view of the modern audio landscape, encompassing both technological advancements and user-centric developments. By examining the evolution from traditional radios to advanced digital platforms, we can understand the profound impact these innovations have on our daily lives and the broader entertainment industry.

3a TYPE OF RESEARCH

This study is DESCRIPTIVE in nature. It helps in breaking vague problems into smaller and more precise problems and emphasizes on discovering new ideas and insights.

3a DATA COLLECTION METHOD

Primary Data:
questionnaire of 100 was used to collect primary data from respondents.

Secondary Data:
Secondary Data was collected through Internet, related books and journals.

3a SAMPLE DESIGN AND SIZE

For conducting this research, a structured questionnaire of 100 question is prepared (shared in annexture) and a sample of 65 customers is taken

3a TOOLS AND TECHNIQUES OF ANALYSIS

The various tools and techniques of analysis to examine and interpret the collected data. Here are some commonly used tools and techniques:

Survey Questionnaires: questionnaire of 100 has been used as survey questionnaires to help gather quantitative data from a representative sample of individuals in pune and vadodra The survey has Questions related to usage patterns, preferences, and satisfaction levels. Statistical analysis can be applied to analyze the survey responses, such as calculating percentages, averages, correlations, and conducting inferential analysis.   Interviews: Conducting structured or semi-structured interviews with selected participants was conducted to provide qualitative insights into their experiences

3b LIMITATIONS OF STYDY

Study the existing process

What are some problems with the radio?

The most common problems with radio reception are weak signals or interference. Interference can be caused by anything with an electrical or magnetic current. Changing weather patterns can also cause problems with radio reception. The radio antenna is the most important factor in achieving good reception.

What causes poor FM radio reception?

A station having a low-powered transmitter can cause reception problems, as well as a station that is a distance from where you are and the signal loses stamina by the time it reaches you. Verify the antenna lead is connected to the antenna jack on the rear of the car stereo receiver and that the connection is secure.

What are the weaknesses of radio media?

Disadvantages of radio; Only an audio medium for communication. During bad weather you cannot listen radio properly. Often unclear and is affected by weather. You need to adjust frequency properly. Less and limited radio channels are available compared to other communication medium.

What are the negative effects of radio?

RF radiation has lower energy than some other types of non-ionizing radiation, like visible light and infrared, but it has higher energy than extremely low-frequency (ELF) radiation. IfRF radiation is absorbed by the body in large enough amounts, it can produce heat. This can lead to burns and body tissue damage.

What factors affect radio?

As a form of electromagnetic radiation, like light waves, radio waves are affected by the phenomena of reflection, refraction, diffraction, absorption, polarization, and scattering.

What are the threats to radio?

Challenges like increased competition with new media platforms, streaming giants, and even podcasts seem like threats. But in reality, the audio landscape has just become more diversified. Listeners' habits and attention are now split

FM RADIO IN INDIA FM radio sector is the most significant contemporary development in Indian radio (Neha and Kashyap 2008)8 . India saw its first private sector radio in 1924 in Madras. Later British gave them the license to the Indian Broadcasting Company to start radio stations in Bombay and Calcutta. All India Radio is the government owned FM radio which had all the information and policies of the government. After this2 many private FM channels like Red FM, Club FM etc started to arise. Radio broadcasting in free India endeavoured to shape up in the moulding of Public Service Broadcasting. (Kanchan Kumar 2003)9

3c HISTORY OF Transistor radio

A transistor radio is a small portable radio receiver that uses transistor-based circuitry. Following the invention of the transistor in 1947—which revolutionized the field of consumer electronics by introducing small but powerful, convenient hand-held devices—the Regency TR-1 was released in 1954 becoming the first commercial transistor radio. The mass-market success of the smaller and cheaper Sony TR-63, released in 1957, led to the transistor radio becoming the most popular electronic communication device of the 1960s and 1970s. Transistor radios are still commonly used as car radios. Billions of transistor radios are estimated to have been sold worldwide between the 1950s and 2012.[citation needed]

The pocket size of transistor radios sparked a change in popular music listening habits, allowing people to listen to music anywhere they went. Beginning around 1980, however, cheap AM transistor radios were superseded initially by the boombox and the Sony Walkman, and later on by digitally-based devices with higher audio quality such as portable CD players, personal audio players, MP3 players and (eventually) by smartphones, many of which contain FM radios.A transistor is a semiconductor device that amplifies and acts as an electronic switch.

3c Background

A seven-transistor Soviet Orljonok radio with the back open, showing parts.

Before the transistor was invented, radios used vacuum tubes. Although portable vacuum tube radios were produced, they were typically bulky and heavy. The need for a low voltage high current source to power the filaments of the tubes and high voltage for the anode potential typically required two batteries. Vacuum tubes were also inefficient and fragile compared to transistors and had a limited lifetime.

Bell Laboratories demonstrated the first transistor on December 23, 1947. The scientific team at Bell Laboratories responsible for the solid-state amplifier included William Shockley, Walter Houser Brattain, and John Bardeen After obtaining patent protection, the company held a news conference on June 30, 1948, at which a prototype transistor radio was demonstrated.

There are many claimants to the title of the first company to produce practical transistor radios, often incorrectly attributed to Sony (originally Tokyo Telecommunications Engineering Corporation). Texas Instruments had demonstrated all-transistor AM (amplitude modulation) radios as early as May 25, 1954,[6][7] but their performance was well below that of equivalent vacuum tube models. A workable all-transistor radio was demonstrated in August 1953 at the Düsseldorf Radio Fair by the German firm Intermetall. It was built with four of Intermetall's hand-made transistors, based upon the 1948 invention of the "Transistor"-germanium point-contact transistor by Herbert Mataré and Heinrich Welker. However, as with the early Texas Instruments units (and others) only prototypes were ever built; it was never put into commercial production. RCA had demonstrated a prototype transistor radio as early as 1952, and it is likely that they and the other radio makers were planning transistor radios of their own, but Texas Instruments and Regency Division of I.D.E.A., were the first to offer a production model starting in October 1954.

Sanyo 8S-P3 transistor radio, which received AM and shortwave bands.

The use of transistors instead of vacuum tubes as the amplifier elements meant that the device was much smaller, required far less power to operate than a tube radio, and was more resistant to physical shock. Since the transistor's base element draws current, its input impedance is low in contrast to the high input impedance of the vacuum tubes.[10] It also allowed "instant-on" operation, since there were no filaments to heat up. The typical portable tube radio of the fifties was about the size and weight of a lunchbox and contained several heavy, non-rechargeable batteries—one or more so-called "A" batteries to heat the tube filaments and a large 45- to 90-volt "B" battery to power the signal

circuits. By comparison, the transistor radio could fit in a pocket and weighed half a pound or less, and was powered by standard flashlight batteries or a single compact battery. The 9-volt battery was introduced for powering transistor radios.[citation needed]

Early commercial transistor radios

Regency TR-1

Regency TR-1.

Two companies working together, Texas Instruments of Dallas, and Industrial Development Engineering Associates (I.D.E.A.) of Indianapolis, Indiana, were behind the unveiling of the Regency TR-1, the world's first commercially produced transistor radio. Previously, Texas Instruments was producing instrumentation for the oil industry and locating devices for the U.S. Navy and I.D.E.A. built home television antenna boosters. The two companies worked together on the TR-1, looking to grow revenues for their respective companies by breaking into this new product area.[5] In May 1954, Texas Instruments had designed and built a prototype and was looking for an established radio manufacturer to develop and market a radio using their transistors. (The Chief Project Engineer for the radio design at Texas Instruments' headquarters in Dallas, Texas was Paul D. Davis Jr., who had a degree in Electrical Engineering from Southern Methodist University. He was assigned the project due to his experience with radio engineering in World War II.) None of the major radio makers including RCA, GE, Philco, and Emerson were interested. The President of I.D.E.A. at the time, Ed Tudor, jumped at the opportunity to manufacture the TR-1, predicting sales of the transistor radios at "20 million radios in three years".The Regency TR-1 was announced on October 18, 1954, by the Regency Division of I.D.E.A., was put on sale in November 1954 and was the first practical transistor radio made in any significant numbers.Billboard reported in 1954 that "the radio has only four transistors. One acts as a combination mixer-oscillator, one as an audio amplifier, and two as intermediate-frequency amplifiers."One year after the release of the TR-1 sales approached the 100,000 mark. The look and size of the TR-1 were well received, but the reviews of the TR-1's performance were typically adverse. The Regency TR-1 was patentedby Richard C. Koch, former Project Engineer of I.D.E.A.

Raytheon 8-TP-1

In February 1955, the second transistor radio, the 8-TP-1, was introduced by Raytheon. It was a larger portable transistor radio, including an expansive four-inch speaker and four additional transistors (the TR-1 used only four). As a result, the sound quality was much better than the TR-1. An additional benefit of the 8-TP-1 was its efficient battery consumption. In July 1955, the first positive review of a transistor radio appeared in the Consumer Reports that said, "The transistors in this set have not been used in an effort to build the smallest radio on the market, and good performance has not been sacrificed."

Following the success of the 8-TP-1, Zenith, RCA, DeWald, Westinghouse, and Crosley began flooding the market with additional transistor radio models. Westinghouse transistor radio, Model H841P6 (c. 1963) Westinghouse Model H-842P6 (c. 1962) Chrysler Mopar 914HR Duration: 17 seconds.0:17 ,1955 Chrysler – Philco all transistor car radio – "Breaking News" radio broadcast announcement. Chrysler and Philco announced that they had developed and produced the world's first all-transistor car radio in the April 28th 1955 edition of the Wall Street Journal.Chrysler made the all-transistor car radio, Mopar model 914HR, available as an "option" in fall 1955 for its new line of 1956 Chrysler and Imperial cars, which hit the showroom floor on October 21, 1955. The all-transistor car radio was a $150 option (equivalent to $1,710 in 2023).

3d Japanese transistor radios

The circuit of a Japanese 5 transistor radio.

While on a trip to the United States in 1952, Masaru Ibuka, founder of Tokyo Telecommunications Engineering Corporation (now Sony), discovered that AT&T was about to make licensing available for the transistor. Ibuka and his partner, physicist Akio Morita, convinced the Japanese Ministry of International Trade and Industry (MITI) to finance the $25,000 licensing fee (equivalent to $286,842 today). For several months Ibuka traveled around the United States borrowing ideas from the American transistor manufacturers. Improving upon the ideas, Tokyo Telecommunications Engineering Corporation made its first functional transistor radio in 1954. Within five years, Tokyo Telecommunications Engineering Corporation grew from seven employees to approximately five hundred.[citation needed]

Other Japanese companies soon followed their entry into the American market and the grand total of electronic products exported from Japan in 1958 increased 2.5 times in comparison to 1957.

Sony TR-55

In August 1955, while still a small company, Tokyo Telecommunications Engineering Corporation introduced their TR-55 five-transistor radio under the new brand name Sony.With this radio, Sony became the first company to manufacture the transistors and other components they used to construct the radio. The TR-55 was also the first transistor radio to utilize all miniature components. It is estimated that only 5,000 to 10,000 units were produced.[citation needed]

Advertising for TR-63

Sony TR-63

The TR-63 was introduced by Sony to the United States in December 1957. The TR-63 was 6 mm (1⁄4 in) narrower and 13 mm (1⁄2 in) shorter than the original Regency TR-1. Like the TR-1 it was offered in four colors: lemon, green, red, and black. In addition to its smaller size, the TR-63 had a small tuning capacitor and required a new battery design to produce the proper voltage. It used the nine-volt battery, which would become the standard for transistor radios. Approximately 100,000 units of the TR-63 were imported in 1957. This "pocketable" (the term "pocketable" was a matter of some interpretation, as Sony allegedly had special shirts made with oversized pockets for their salesmen) model proved highly successful.

The TR-63 was the first transistor radio to sell in the millions, leading to the mass-market penetration of transistor radios.[25] The TR-63 went on to sell seven million units worldwide by the mid-1960s.[26] With the visible success of the TR-63, Japanese competitors such as Toshiba and Sharp Corporation joined the market. By 1959, in the United States market, there were more than six million transistor radio sets produced by Japanese companies that represented $62 million in revenue.

The success of transistor radios led to transistors replacing vacuum tubes as the dominant electronic technology in the late 1950s.The transistor radio went on to become the most popular electronic communication device of the 1960s and 1970s. Billions of transistor radios are estimated to have been sold worldwide between the 1950s and 2012.

Pricing

Prior to the Regency TR-1, transistors were difficult to produce. Only one in five transistors that were produced worked as expected (only a 20% yield) and as a result the price remained extremely high. When it was released in 1954, the Regency TR-1 cost $49.95 (equivalent to $567 today) and sold about 150,000 units. Raytheon and Zenith Electronics transistor radios soon followed and were priced even higher. In 1955, Raytheon's 8-TR-1 was priced at $80 (equivalent to $910 today).By November 1956 a transistor radio small enough to wear on the wrist and a claimed battery life of 100 hours cost $29.95.[28]

Sony's TR-63, released in December 1957, cost $39.95 (equivalent to $434 today).Following the success of the TR-63 Sony continued to make their transistor radios smaller. Because of the extremely low labor costs in Japan, Japanese transistor radios began selling for as low as $25.By 1962, the TR-63 cost as low as $15 (equivalent to $151 today), which led to American manufacturers dropping prices of transistor radios down to $15 as well.

In popular culture

An early 2000s transistor radio (Sony Walkman SRF-S84 transistor radio, released 2001, shown without earphones)

Transistor radios were extremely successful because of three social forces—a large number of young people due to the post–World War II baby boom, a public with disposable income amidst a period of prosperity, and the growing popularity of rock 'n' roll music. The influence of the transistor radio during this period is shown by its appearance in popular films, songs, and books of the time, such as the movie Lolita.

In the late 1950s, transistor radios took on more elaborate designs as a result of heated competition. Eventually, transistor radios doubled as novelty items. The small components of transistor radios that became smaller over time were used to make anything from "Jimmy Carter Peanut-shaped" radios to "Gun-shaped" radios to "Mork from Ork Eggship-shaped" radios. Corporations used transistor radios to advertise their business. "Charlie the Tuna-shaped" radios could be purchased from Star-Kist for an insignificant amount of money giving their company visibility amongst the public. These novelty radios are now bought and sold as collectors' items amongst modern-day collectors.

Rise of portable audio players

Since the 1980s, the popularity of radio-only portable devices declined with the rise of portable audio players which allowed users to carry and listen to tape-recorded music. This began in the late 1970s with boom boxes and portable cassette players such as the Sony Walkman, followed by portable CD players, digital audio players, and smartphones.

3d WHAT IS RADIO
Why is it called the radio?

Etymology. The word radio is derived from the Latin word radius, meaning "spoke of a wheel, beam of light, ray".

What is radio? Radio is sound communication by radio waves, usually through the transmission of music, news, and other types of programs from single broadcast stations to multitudes of individual listeners equipped with radio receivers.

What is the full form of radio?
The etymology of "radio" or "radiotelegraphy" reveals that it was called "wireless telegraphy", which was shortened to "wireless" in Britain. The prefix radio- in the sense of wireless transmission, was first recorded in the word radio conductor, a description provided by the French physicist Édouard Branly in 1897.

3d Radio waves and modern audio systems Can ease your Life

the advantages of transistor radio are many, The use of transistors instead of vacuum tubes as the amplifier elements meant that the device was much smaller, required far less power to operate than a tube radio, and was more resistant to physical shock.

What are the advantages of radio?
Radios are portable, unlike television.
Radios are cheaper as compared to television.
It is cheaper for firms to advertise on the radio than on television.
It does not affect eye vision, unlike television.
It is more cost-effective.

It is less distracting than television.

What are three advantages of transistors?
They are smaller in size, use less power, have a longer life span, and are more rugged. They can be used in integrated circuits where many transistors are fabricated on a single chip. They can operate at very low voltages and currents making them ideal for use in portable electronic devices.

What are 2 advantages of radio waves?
Radio waves are transmitted easily through air. They do not cause damage if absorbed by the human body, and they can be reflected and refracted to change their direction. These properties make them ideal for communications.

What are some advantages of the radio?
Radio is one of the most immediate ways to reach your audience. Listeners can count on the radio as a "right now" source for news and information. As radio shows are airing, listeners are able to hear it in real-time, as broadcasters provide them with entertainment, news, and current information.

What is the future of FM radio?
The future of FM radio looks promising with continuous innovation. Predictions for 2026 and beyond include more interactive channels and the integration of AI technologies to enhance the listener experience.

3e Concept sketches for a new product Doodle/Initial Sketches

Concept sketches for a new product

TUNE

BATTERY

FM AM OFF

Bottom

WHEELS

Top

SPEAKER

TUNE

VOL

OFF AM FM

REAR

SIDE

FRONT

VOLUME

RADIO
SETUP

SIDE VIEW

TOP VIEW

H2A

SIDE VIEW

TOP VIEW

Volume (+)

Volume (-)

Radio set up

INSPIRATION:
[MIKE WAZOWSKI]
MOVIE CHARACTER [MONSTER INC.]
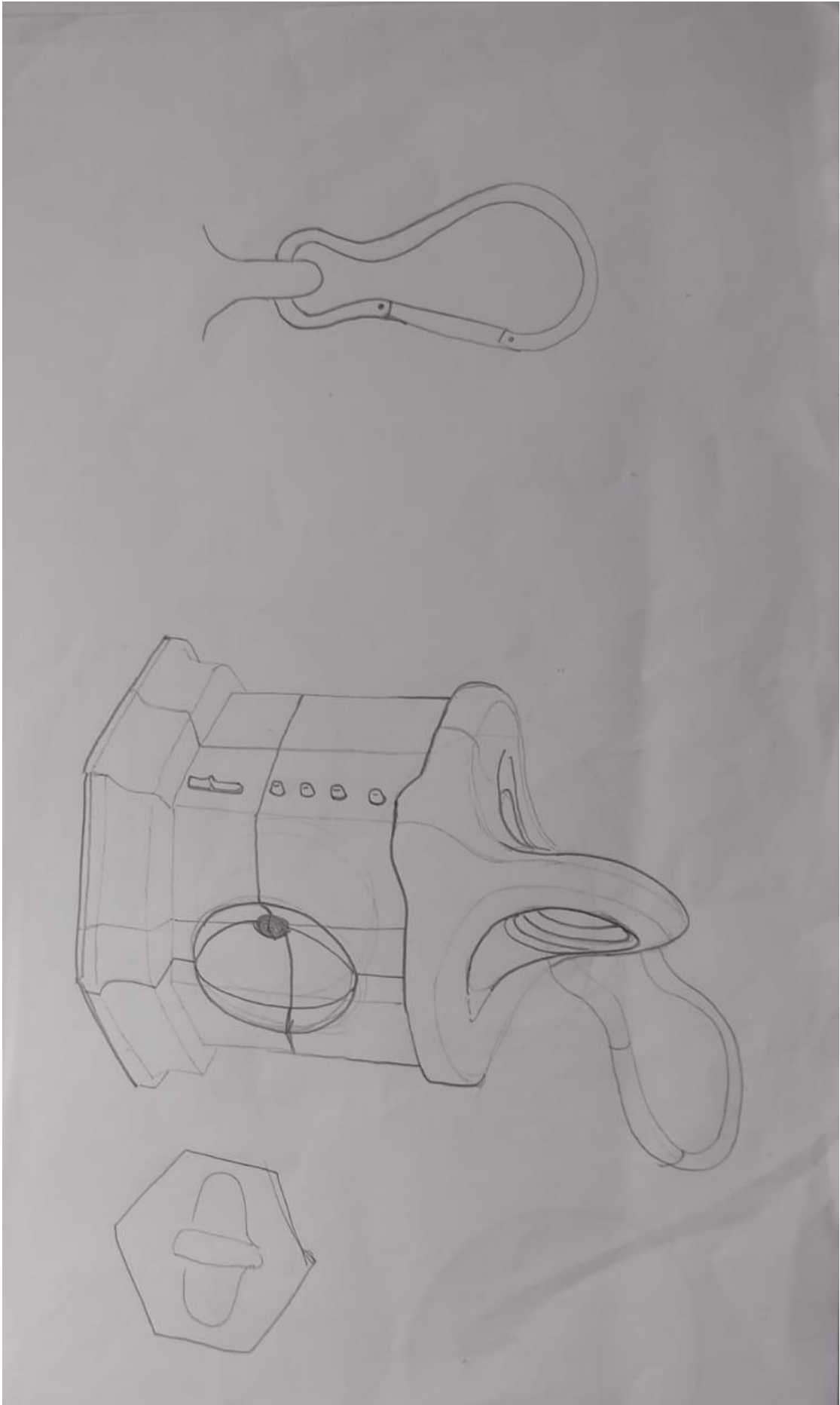
→ stainless steel

AM
FM

→ vacuum forming

polypropiene and aramid fiber
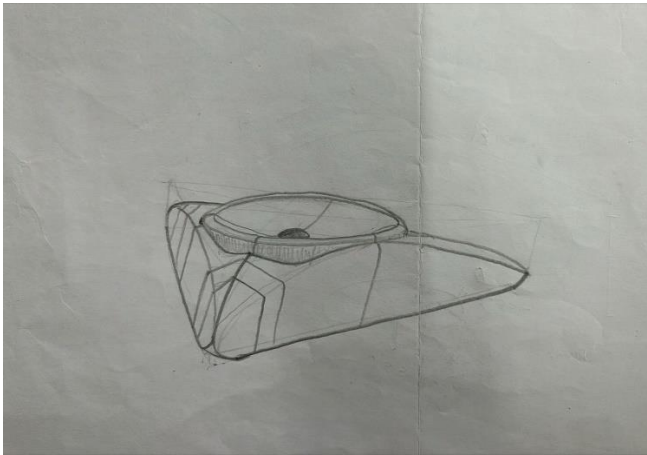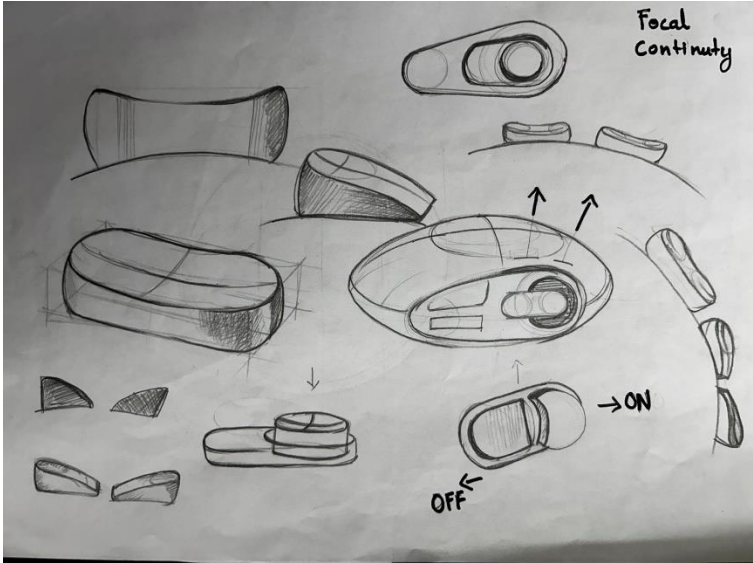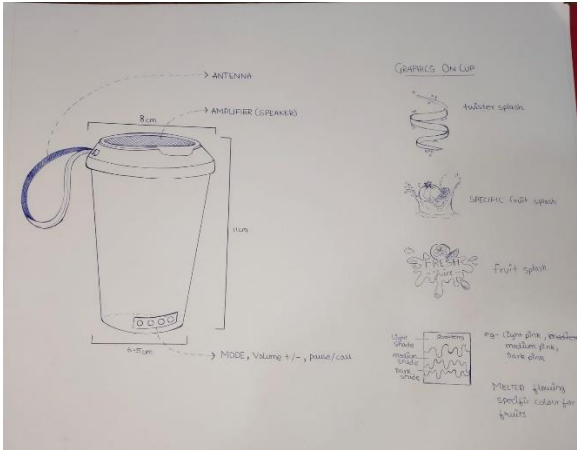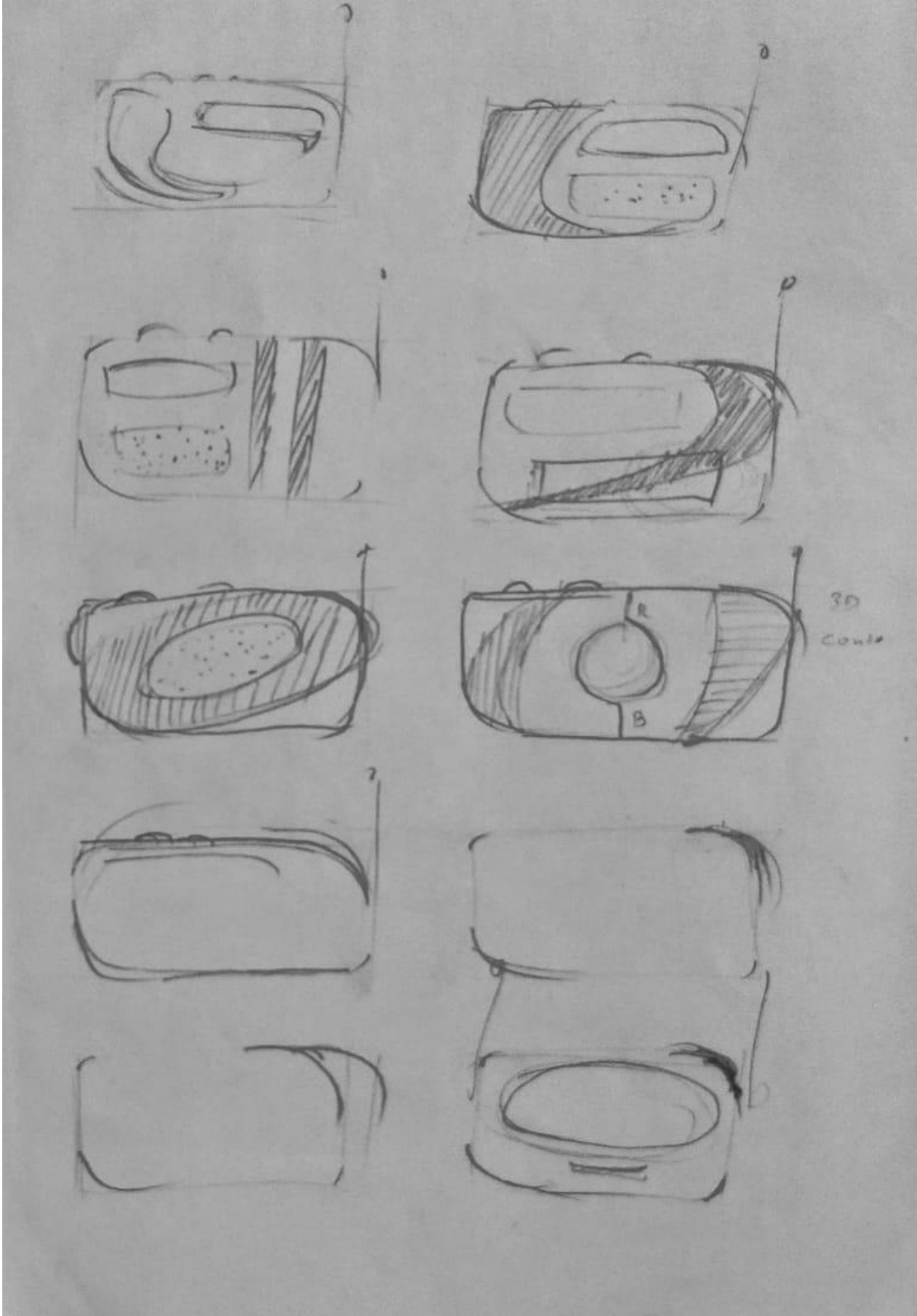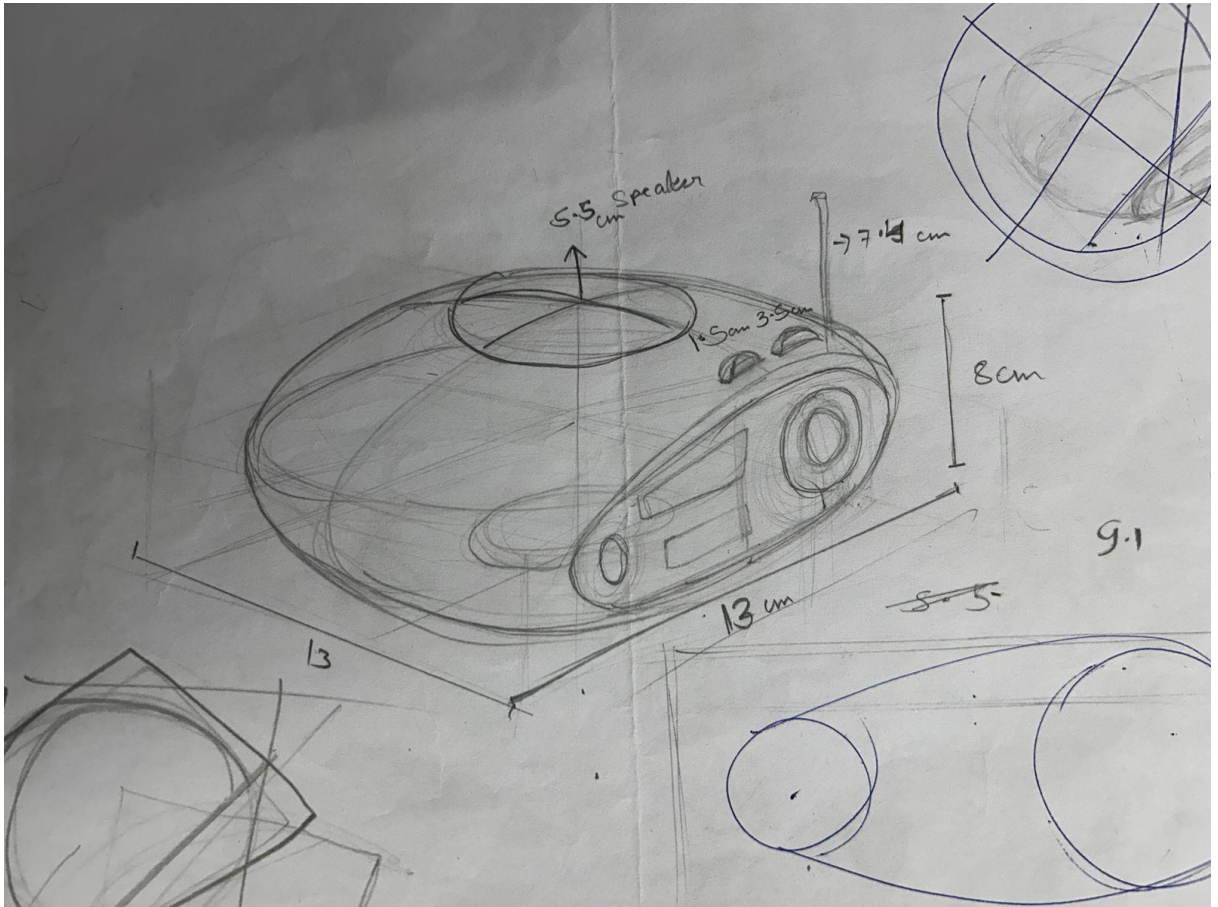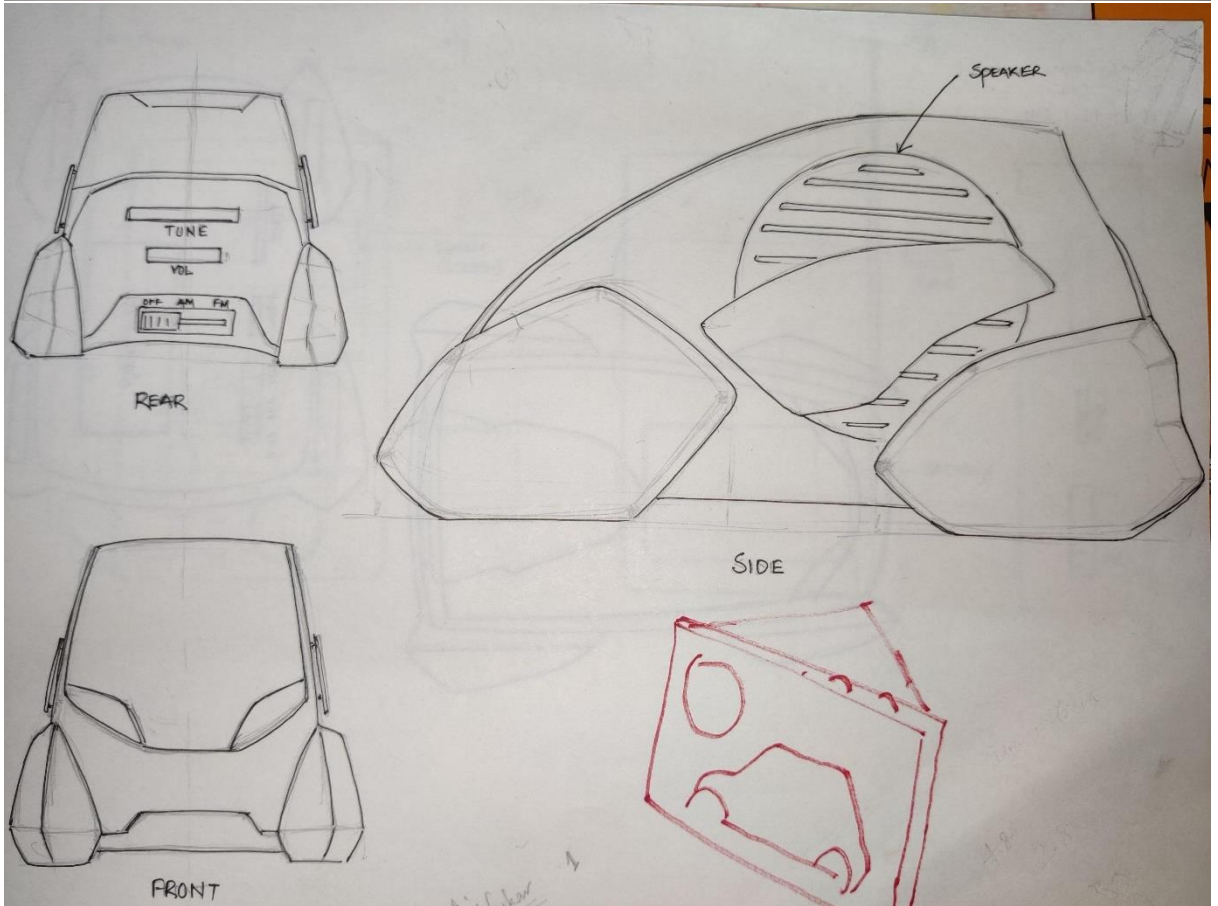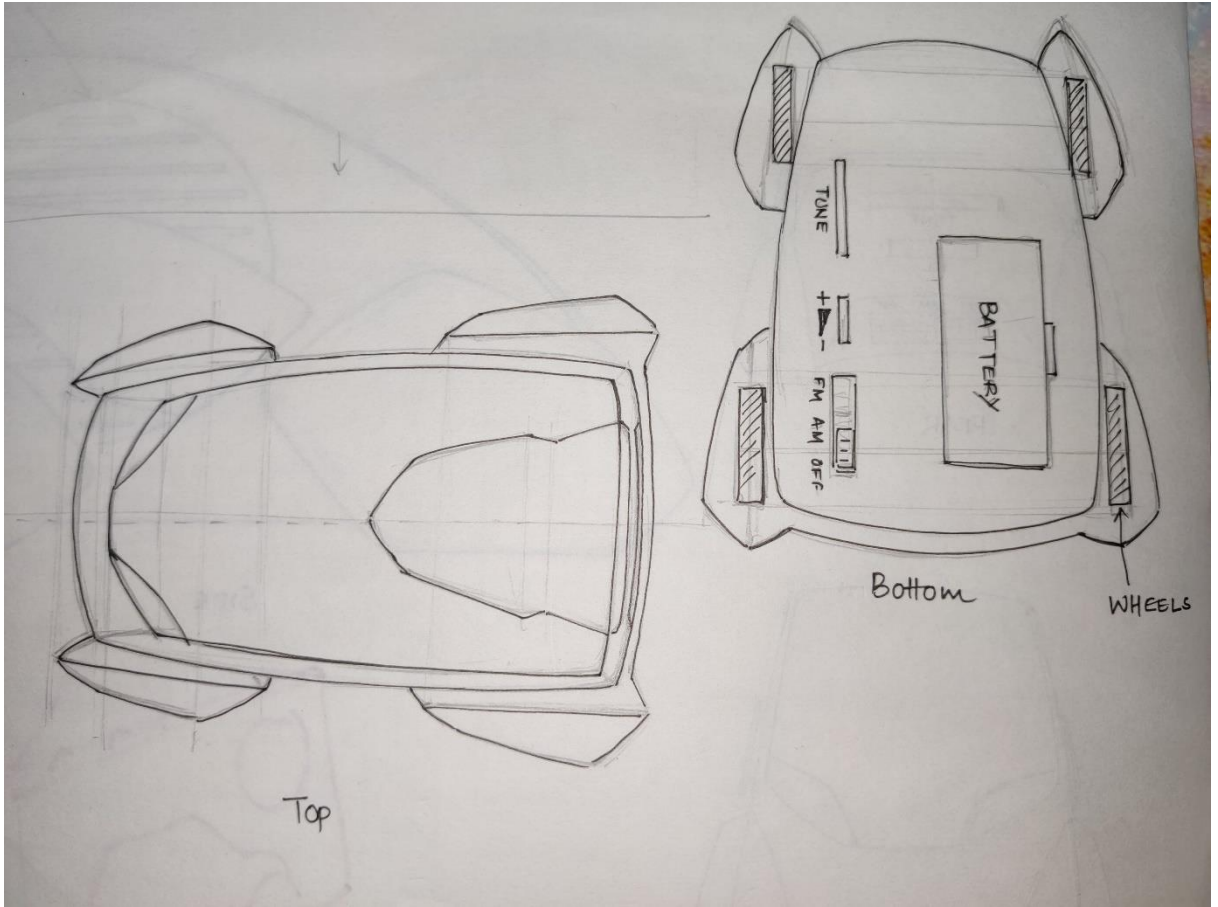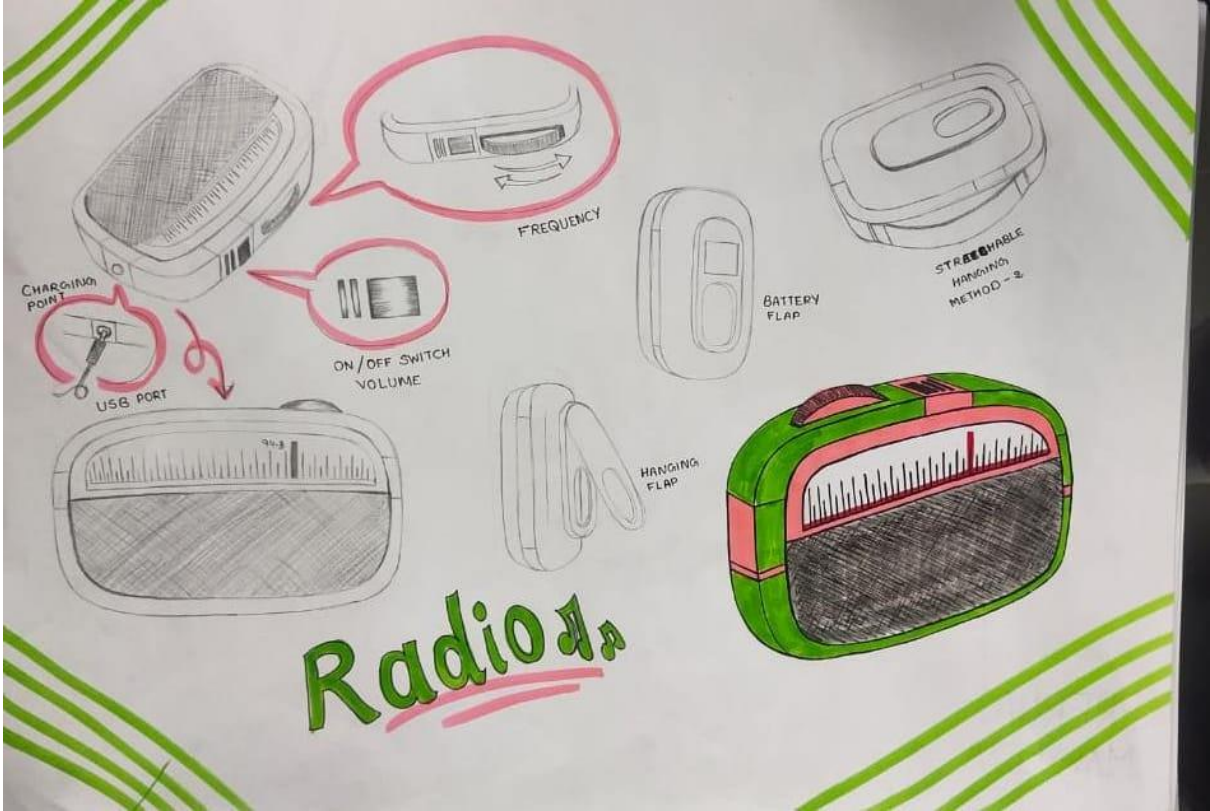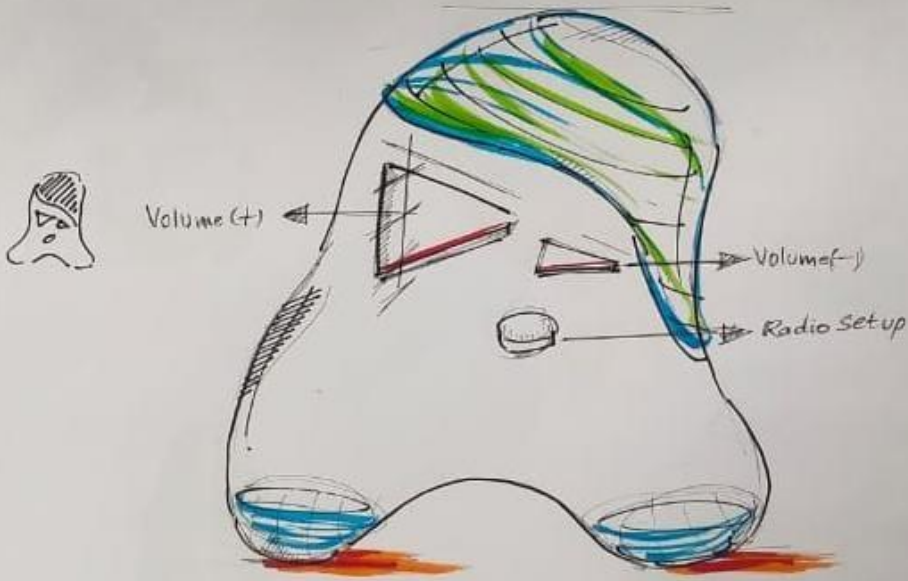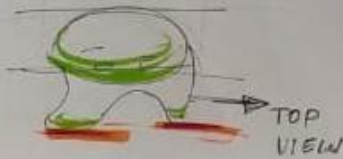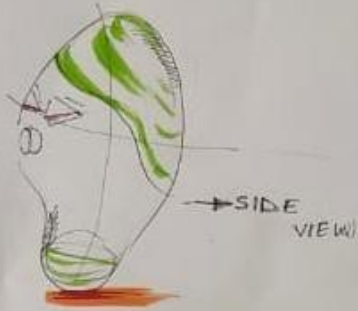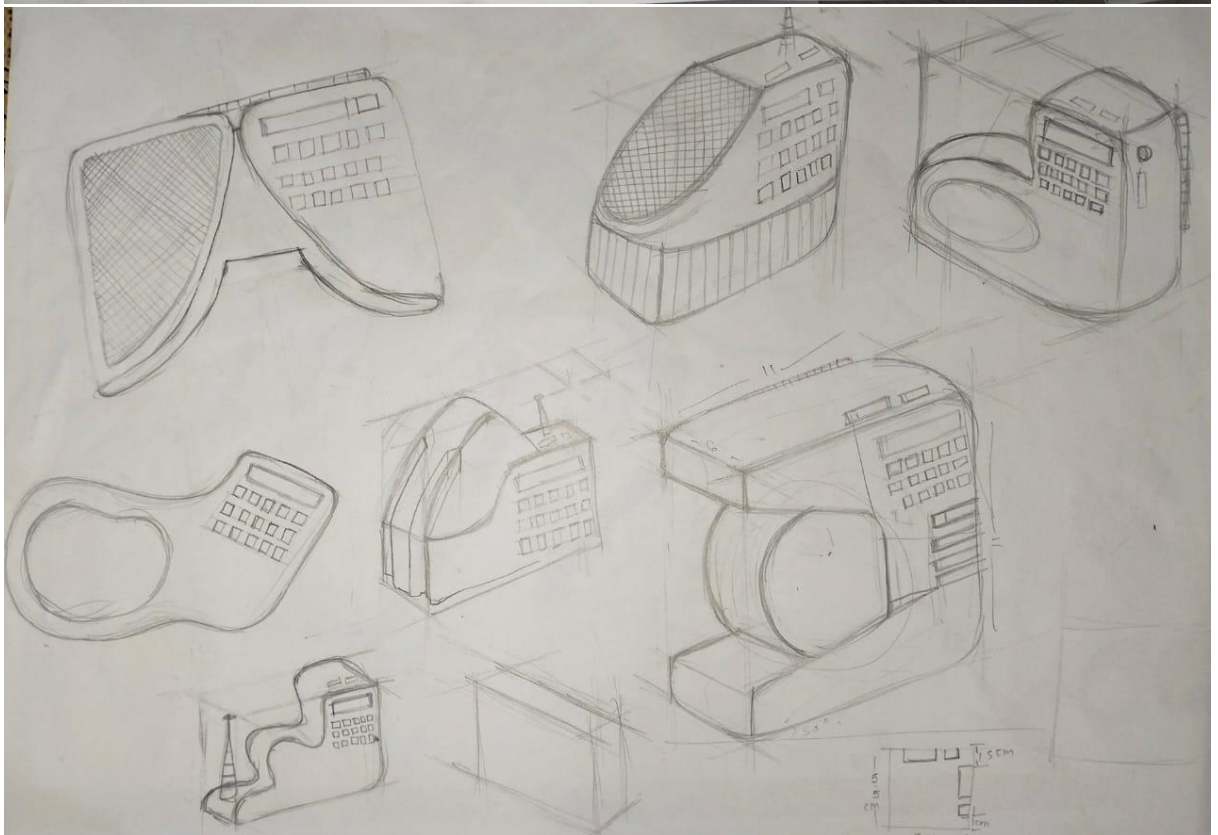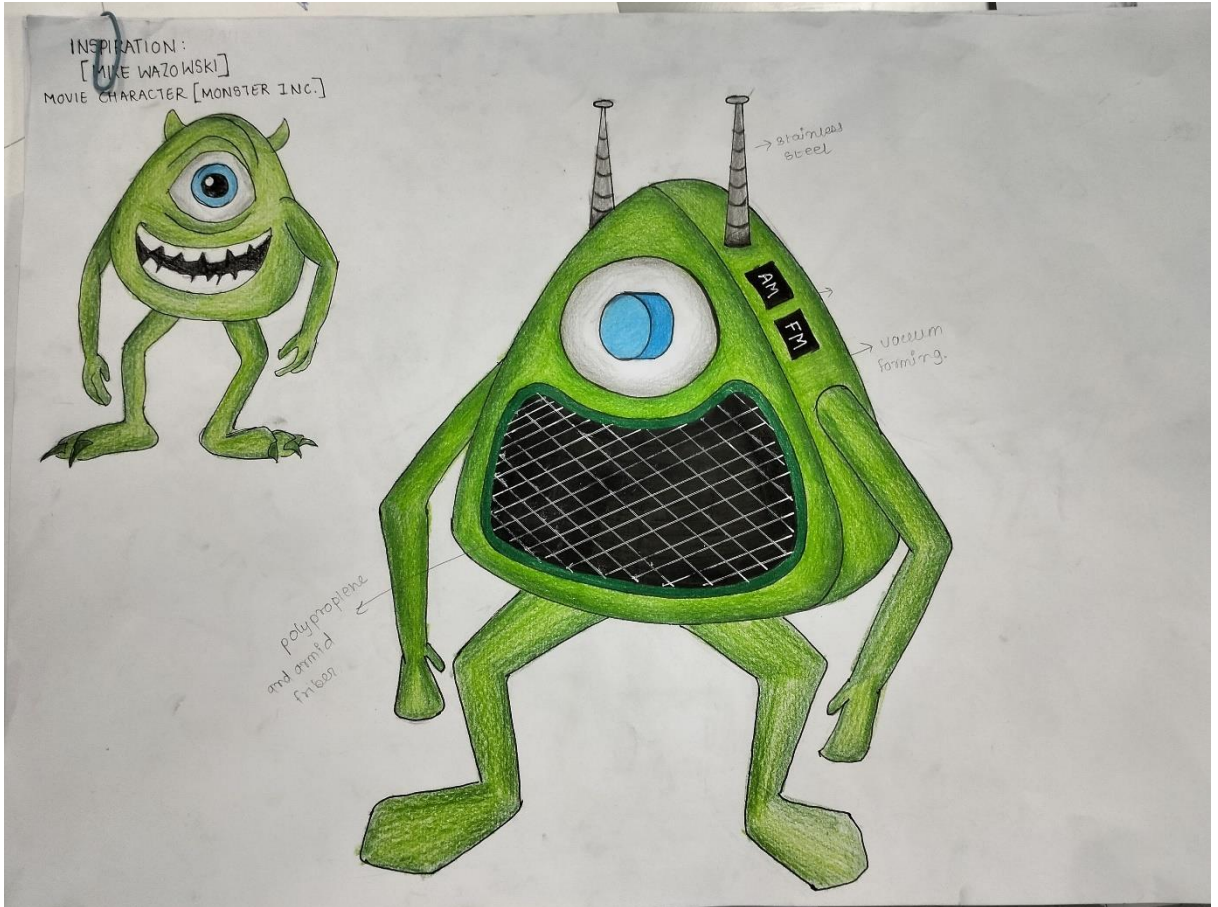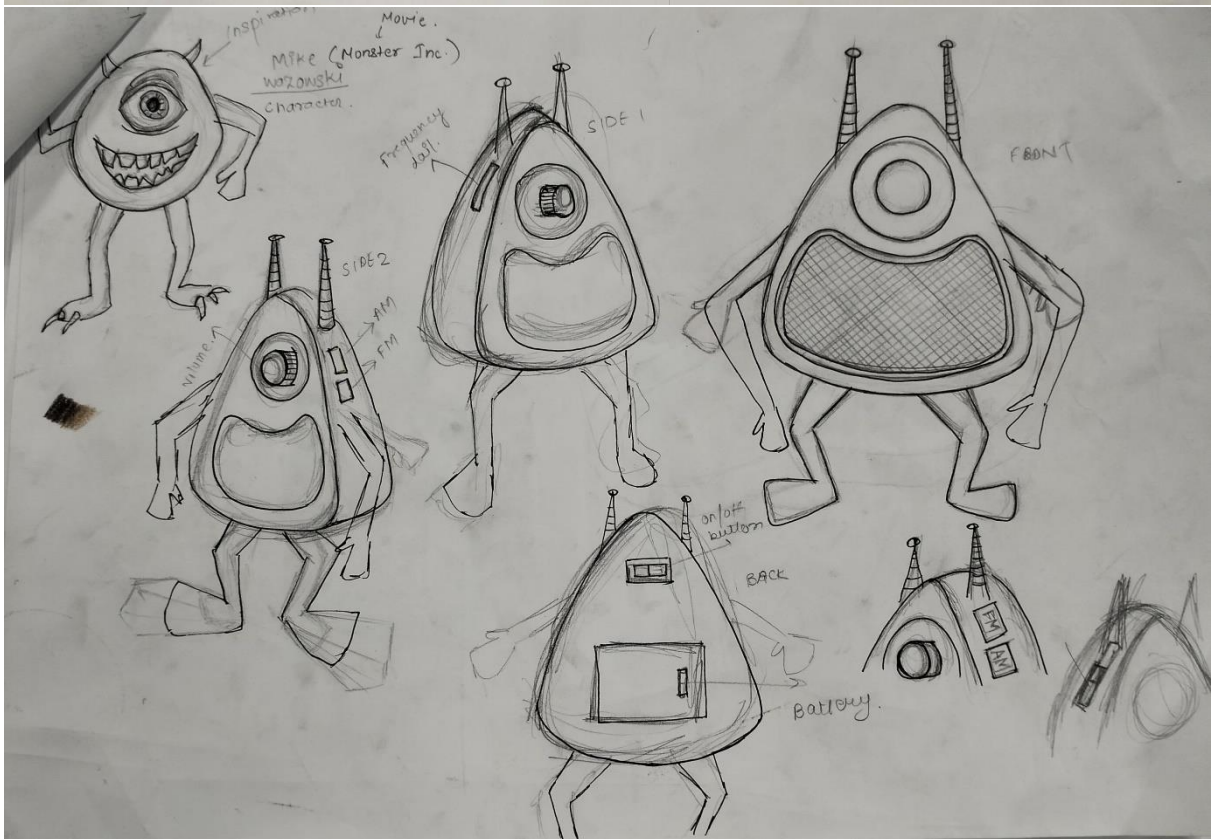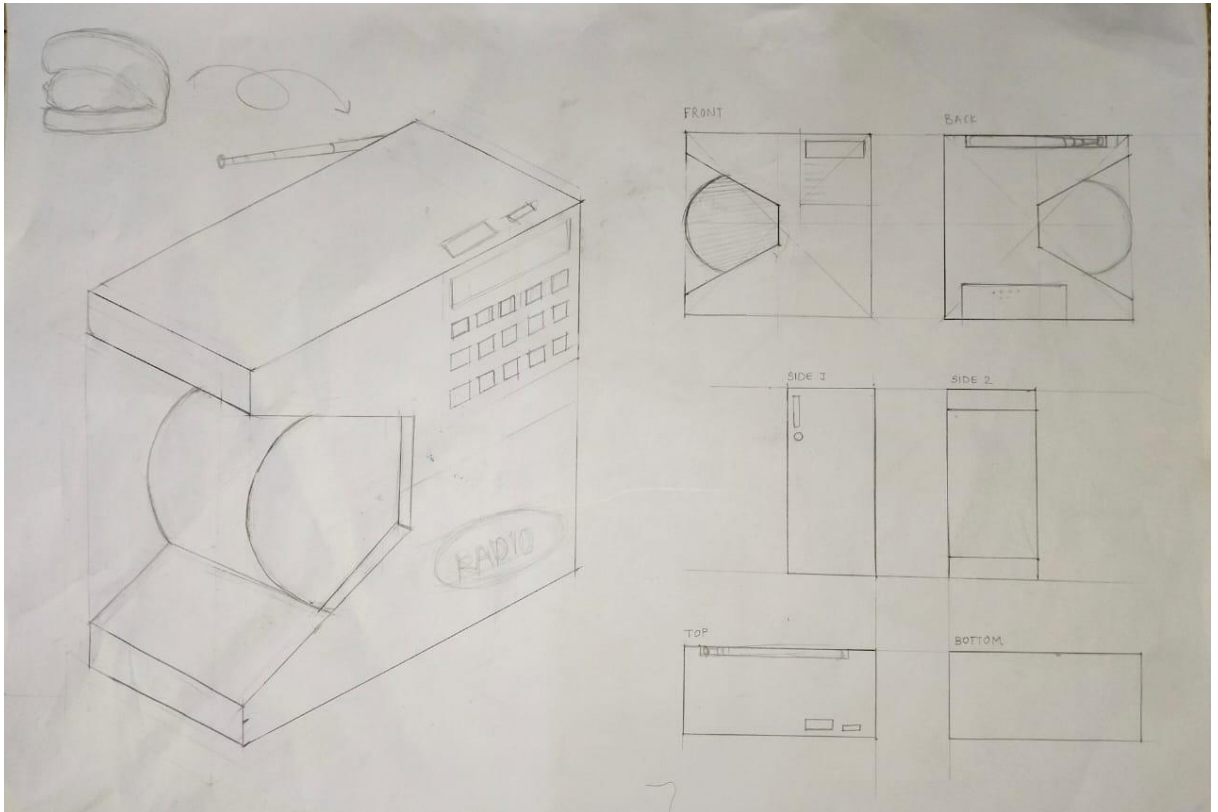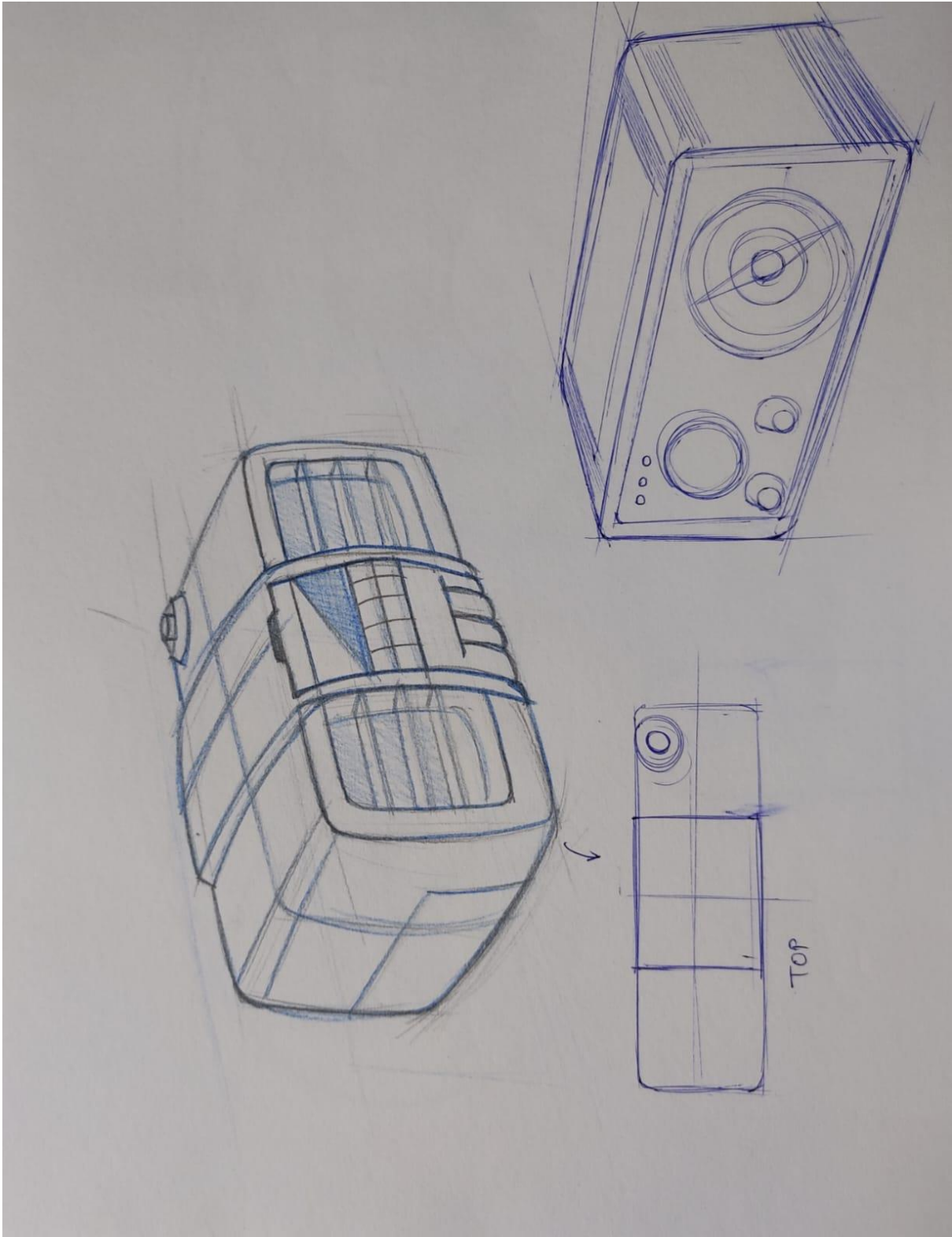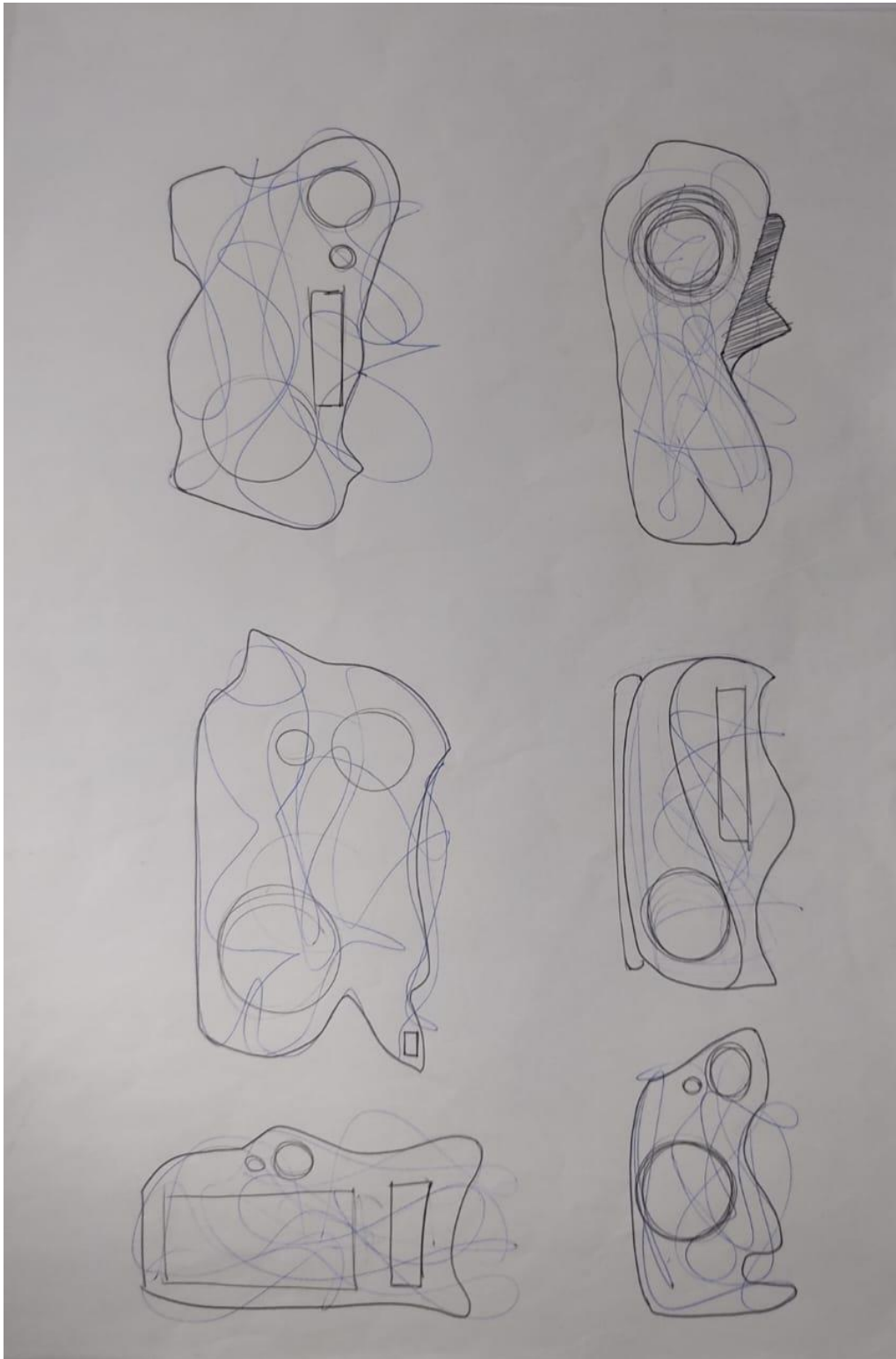
Doodle/Initial Sketches
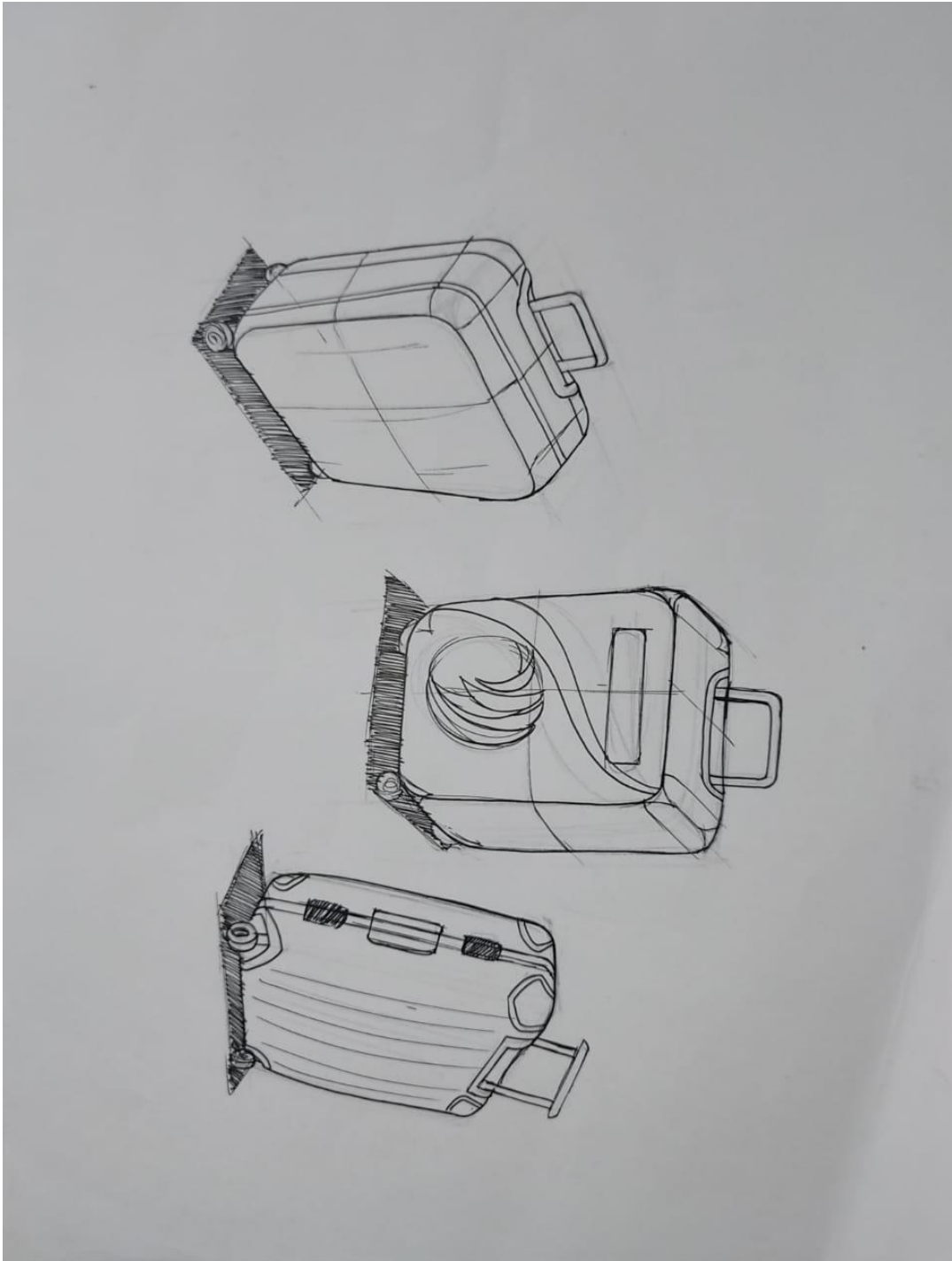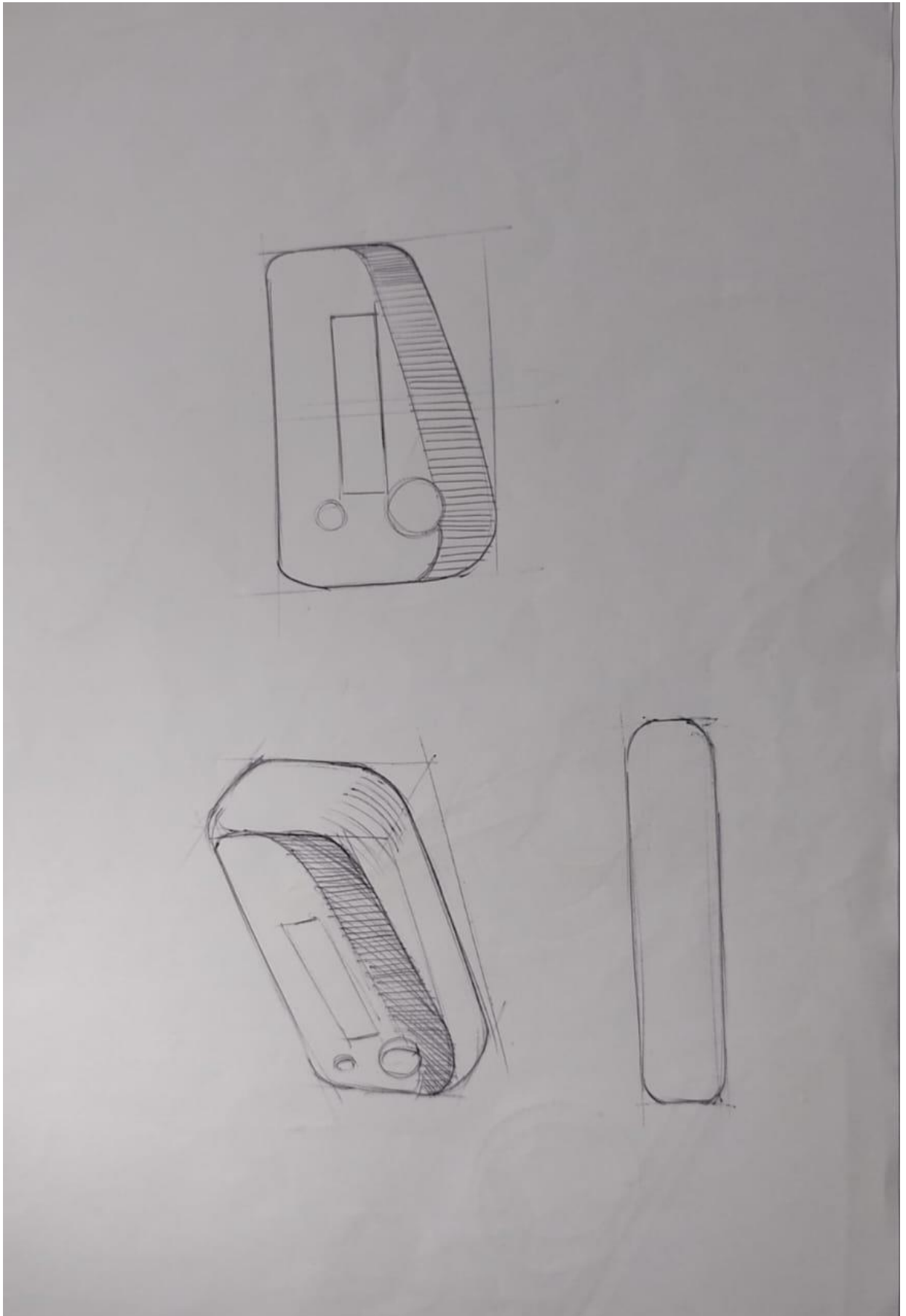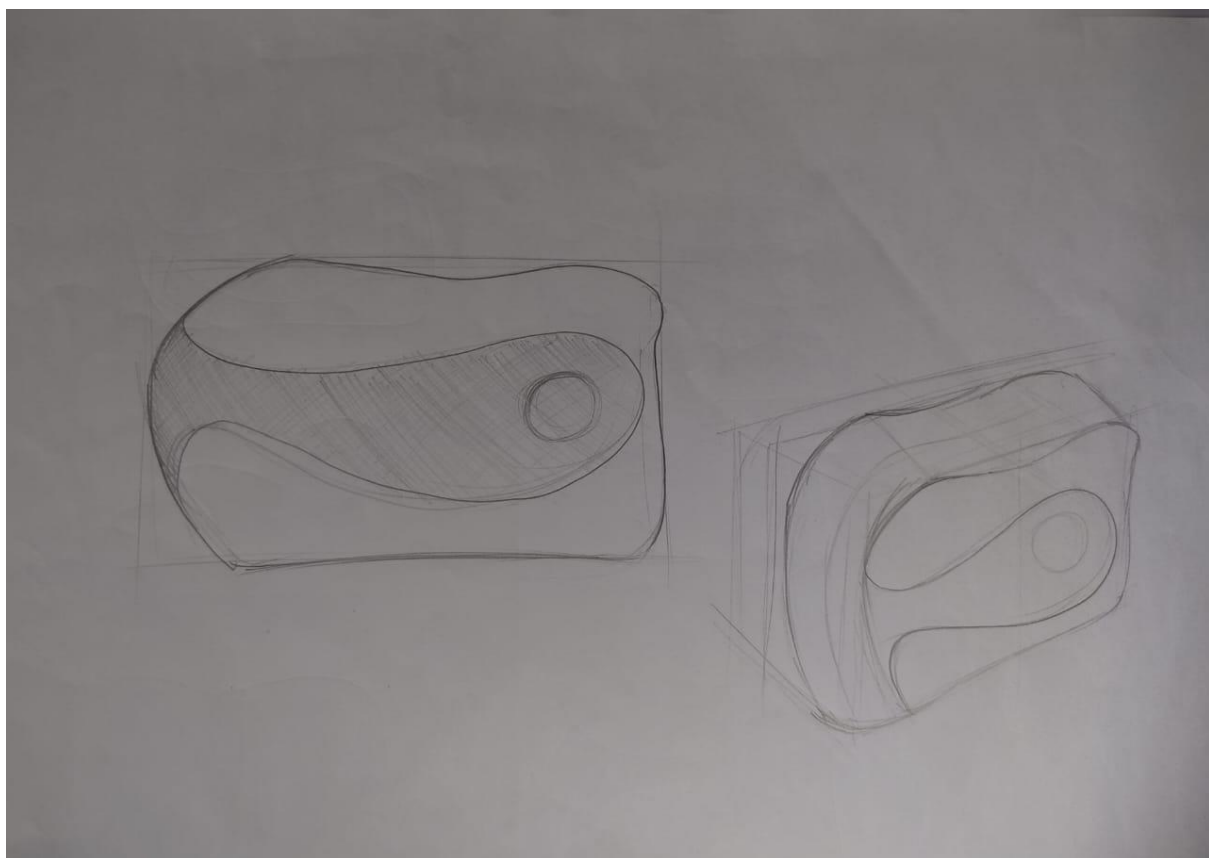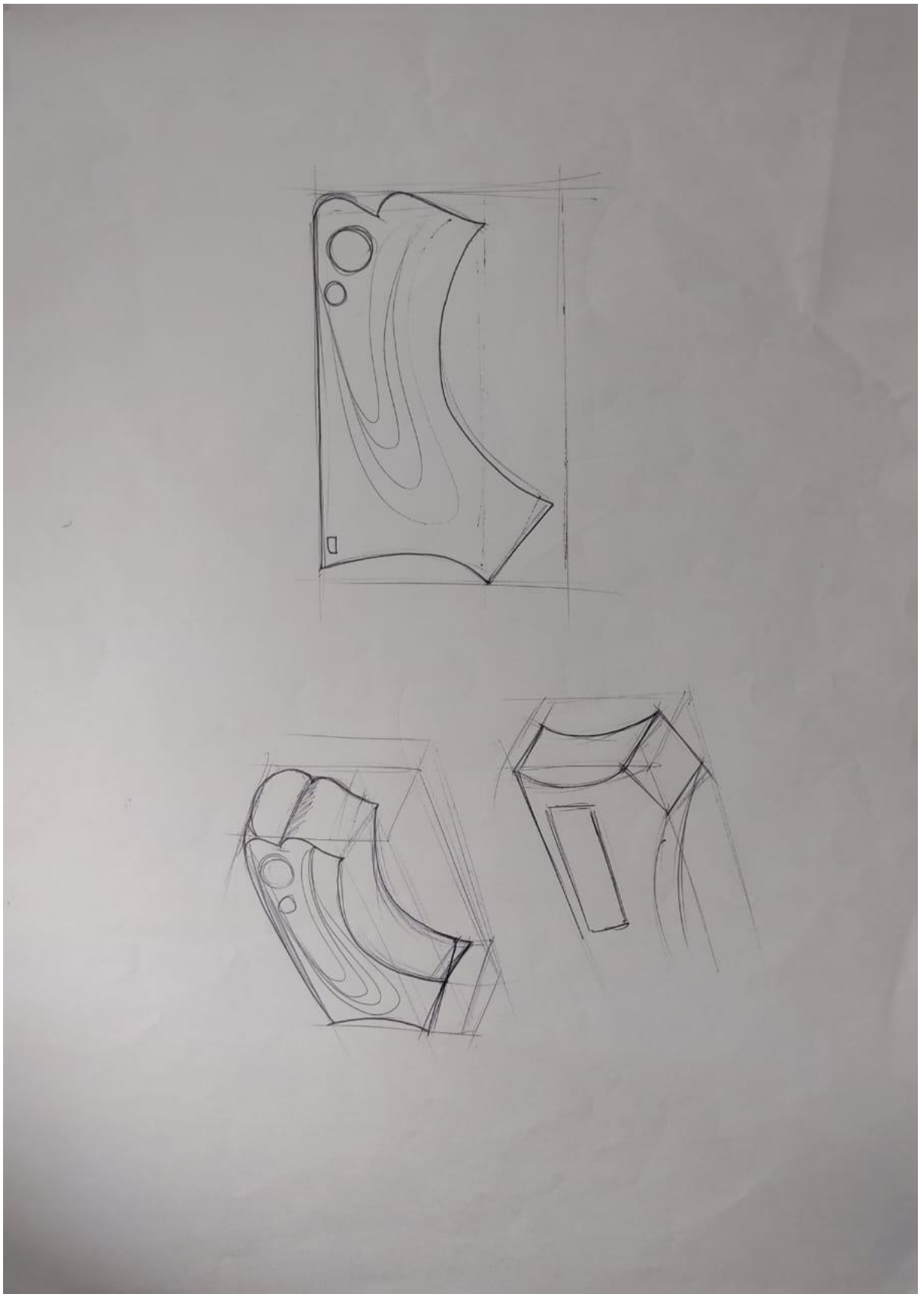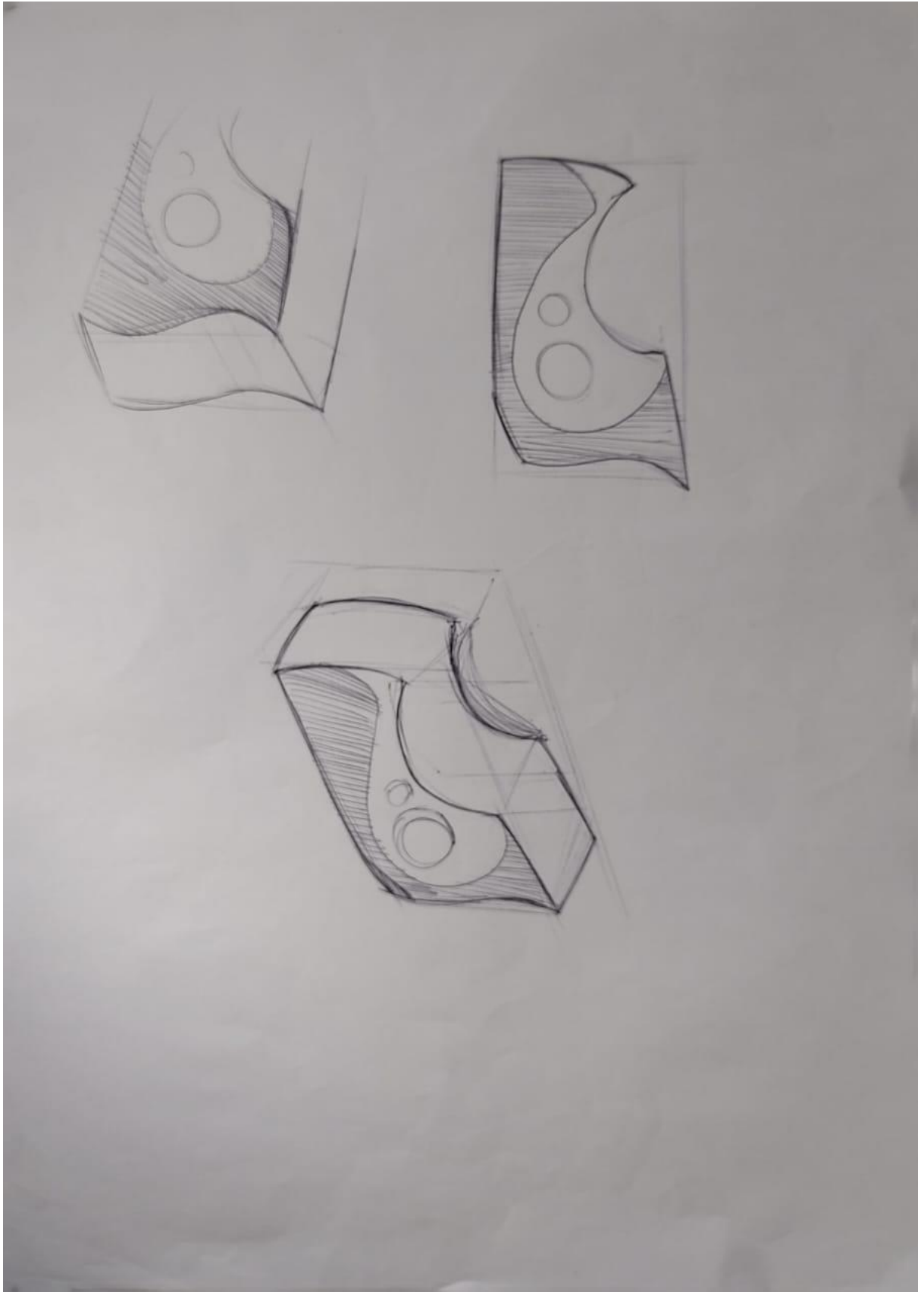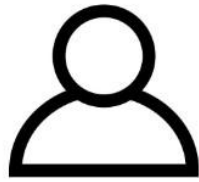
3f User Research User Persona Creation Brainstorming: Generating a wide range of ideas.

User Persona Creation example

3f Brainstorming: Generating a wide range of ideas.

All the words given below which are more than a 100 are directly related to the system of radio or radio frequency technology . This exercise is an exhaustive and comprehensive efforts to ensure no part is missed out related to the subject

Broadcast airwaves radio- wireless ham commercial show air transistor station

Radiogram FM newscast program host simulcast set shortwave roger beam airing Raise transmit transmission Announcer Radiophone static rf sportscast aerial clock radio Radioman broadcaster transceiver booster radio station tune reception   channel airtime walkie-talkie high frequency radiophotograph transmitter radio-controlled beacon repeat console sonobuoy studio playlist spot network airplay programme receive read atmospherics spark goniometer radio compass radio galaxy low frequency over dial radio wave tuner radio spectrum superhigh frequency very low frequency receiver interference anchor show business radio-silent galactic noise   crystal set radio astronomy cabinet programming live pirate listen in radio-bright echo ultrahigh frequency medium frequency very high frequency signal drama huckster break wave band copy long wave audience blackout hookup on wilco converter on the air tune in space telegraphy radio-loudness radio jock UHF disc jockey telescope radio luminosity piracy radio mike radio-loud radio phonograph radiotelephone rating news the mass media superheterodyne receiving set radio range rt AM waveband Rebroadcast cosmic noise radio clock Hertzian wave radio-tagged digital radio announce edition radio control transcription off the air airway boom box jam DJ volume pulsar weatherman bandwidth listener radio-tag call letters Mayday rdo lead-in directional call-in medium VHF on-air band radio cassette sound NPR RDF radiophotography Aircheck radioless Breaker sign off blind spot wireless telephone prerecord Johnson noise present cross talk rediffusion radio set radio cast radioland EPIRB spectrum Anchorman dit anchor-woman   Detector frequency Wavelength shock jock Play radio-luminous Episode media Magazine net Radiophoto remote Series mast RCA Aïr radio recorder RFID rawin radio star earphone radiogenic dipole antenna chassis broadband guided missile listenership announcement radiogoniometry radiotelegraph coverage plug reflex intercept commercial break CB transistor radio Clio soap opera Communication chat show Transponder radio show Blooper short wave remote control quiz program superman radiotelegraphy VOR VLF Micro wave omnidirectional RTE radio receiver radio-collared Muzak sound effects dish radiogoniometer rig drone radiophysics radioheliograph radio van radio radar heterodyne radio silence cellular editorial radioteletype ether radio observatory front radiovision walkie–talkie sky wave radi- relay station radio sun radio play airband presenter

flash radio telescope radio fix radio car radiothon Davis newsreader telemeter coherer Citizens' Band cell radio talk radio alarm clock ghetto blaster preset production interview ead air documentary hostess relay get on send emcee megahertz scanner radome retune two-way jansky RDS radio beacon Peel radiotelemetry Quasar radio engineering Dah sketch Law scriptwriter Patch turn platform Newscaster press release Bass omnibus Roadshow radio-gramophone ring in radiotelegraphy canned in person air traffic control report medium wave signature radio-telephony guest shack on (the) air wire radio sparky vector ultrashort IARU radiophare filler phone in giveaway antenna journalism blast news agency carrier flight control Reading commentator patrol car carry newsroom hi-fi listen blip FC station RMI crystal detector space telecommunications time signal panelist mass media wireless compass ILR RFC down–lead radio transmitter FA station radiotelegraphically radio paging radio tube talk-radio take to the airwaves radio-telegram marconigram pylon antenna spot advertising extremely low frequency extremely high frequency box radio engineer radio–control radiotechnology radio-station commercial announcement web radio-telegraphist radio-telegraphic shadow atmospheric absorption radio navigation radioize smart bomb radio jockey phone–in interfere beam–rider whip antenna tune in (something) QSS radio navigational radio sky off (the) air talk radio CBer DX radio astronomer Cellphone radiotrician tube set air check voicecast beaconry pilot sparks B station callback radio-quietness lid CRTC radio cassette recorder ACTRA outlet g'day space relay jammer pip message radiogramophone stray radio wavelength wave trap listening figures radio range station radio noise radio pulse radio dish radio-quiet transmission level airwave beatbox radiothermics omnirange logging Armstrong radio chatter radio-astronomical radio brightness log call sign RF station air wave ultralow frequency spark transmitter weathercaster tube transmitter weathergirl dittohead RNZ reach broadcast booth radio shack radio cassette player surf radio emission pancake turner cat's whisker stupid put out introduce glide slope Handie–Talkie airable canned laughter bring in British Broadcasting Corporation broke come in inˈterroˌgator sensitive setting radiofrequency radio frequency radio collar radio–tag radiosurgery radio relay radio microphone fax weathercast communiqué photoradio squirt radiophonist radio-tagging radio map drone aircraft selector sender stinger chirpy outside broadcast key broken closedown welcome gain request programme receiving apparatus come school broadcast ultra-high frequency pulse modulation preselector wirelessly near-field racecaster CQ ursigram radio halo surface wave radio alarm radio signal car radio citizens band facsimile pitchman question radio energy knob scrambler static (electricity) solar noise strong precoding bulletin electrical transcription MOR MMDS aircraft station break up go out De Forest absorption Telecontrol radio dial Balun fan marker Strength beat oscillator direction finder radio direction finding magic eye frequency band transmitting set Third Programme

space wave troposcatter radio meteor GPRS Holmes GPS Independent Broadcasting Authority sign (sth) off Photo radio gram call in Blare shot noise station selector act advertise bed wireless transfer ad air date talkback tap cover promo compere talker off radio-phonograph cellular phone detune null mixer mobile phone moderator jingle DOVAP switch over front end check beamget a fix on duplex sent edit panel National Public Radio talk down loudspeaker radio sounder school broadcasting fem cee spectral index serial trimmer digital tuning go on feature audience flow comedy drama DAB lampworker bell Baylis media blitz come on plugola special D-layer background music gigahertz mailbag news desk cordless telephone bleep dedicate get spotted syndicate postbag car phone mixed media hertz radio net audible control radiophonics radiophysical quenched spark rock 'n' roll station Bridge uniform Cellnet desk antenna circuit round-up land station bi-media noise field intensity narrowcasting Monopole actress skip distance selectance syntonize shock radio/TV crystal receiver talk show tuning eye the ratings actor panellist fade-out telecoms niner wavemeter commentary daytimer home reporter sked selectivity mass advertising underneath radio-frequency survive telephony pick-up newsflash needle time ERC landing beacon dead zone Lima hotel intermediate frequency godslot factsheet golf studio audience ground wave handy-talkie foxtrot common carrier autotune papa shipping forecast range radio contact Romeo emission repeat fee trail retransmit tango surf report recording ride radiosonde shout print advertising the Voice of America podcast vox pop sierra signature tune cue sheet prompt unicom laugh track cruiser live coverage mobile station oscillator phase modulation rawinsonde readout radioacoustics station break sense finder syndicated adless air time air traffic controller comment fixed station fourth estate automatic direction finder background noise kilohertz in the flesh digital tuner fix line-up local radio news bulletin piece E-layer earth station sound bite stay tuned telecommunication fade autodyne compass headphone link electronic countermeasure spotter tricast superstation effect locator kilo instrument landing inductive coupler loading namecheck spoof day modulate the ionosphere broadcast journalism radiate delta dead spot decametric fuzz markerLovell out media convergence scramble scheduler stretch radiolocation radionic re-entry blackout resonator Charlie Quebec radio industry riometer station finder segment pick up treble tuning satellite dish close down off-air reportage saucer sportscaster wireless telegraphy infrared interception telegraph stream telemetry transparent amateur band radio talk show host radiotelex radio amateur radio network radio pirate reflector pulse radar reˌgeneˈration radar radiolocator schedule

CHAPTER 3g Materials Research:

Polystyrene polymer

Polystyrene polymer used as the Manufacture of toys, radio and television cabinets, wrapping material, etc. The following table shows the various types of polymers with respective structures & uses. Manufacture of toys, radio and television cabinets, wrapping material.

Bakelite items, particularly jewelry and radios, have become popular collectibles. The term Bakelite is sometimes used in the resale market as a catch-all for various types of early plastics, including Catalin and Faturan, which may be brightly colored, as well as items made of true Bakelite material

Today's radio consists of an antenna, printed circuit board, resistors, capacitors, coils and transformers, transistors, integrated circuits, and a speaker. All of these parts are housed in a plastic case. An internal antenna consists of small-diameter insulated copper wire wound around a ferrite core. FM Broadcast Transmitter. FM Antenna. Cable RF to connect with the antenna to FM Transmitter Connectors. Mixer Console. Microphones. Headphones. Headphones distributor.

3h Concept Development

Concept Development for Future Transistor Radio Users

The transistor radio, a staple of personal audio for decades, must evolve to stay relevant in a digital age dominated by smart devices and streaming services. This concept development aims to reimagine the transistor radio for future users, integrating modern technology while preserving its nostalgic charm.

2. Market Analysis

Current Trends:

Smart Devices: Growth in smart speakers (e.g., Amazon Echo, Google Home) indicates a preference for integrated, voice-activated devices.

Streaming Services: Platforms like Spotify, Pocket FM, and Kuku FM are leading audio consumption trends.

Portability: Despite technological advances, there's a continued demand for portable audio solutions.

Target Audience:

Tech-Savvy Consumers: Interested in advanced features and integrations.

Nostalgia Seekers: Value the retro aesthetic and simplicity of transistor radios.

Outdoor Enthusiasts: Need durable, portable audio solutions for activities like hiking and camping.

3. Key Features and Innovations

Hybrid Functionality:

Analog and Digital: Retain AM/FM capabilities while adding internet radio and streaming service integration. Bluetooth Connectivity: Enable pairing with smartphones and other devices for expanded functionality.

Smart Integrations:

Voice Assistants: Integrate with popular voice assistants (Alexa, Google Assistant) for hands-free control.Smart Home Integration: Compatibility with smart home ecosystems, allowing users to control the radio with smart home setups.

Enhanced Portability:

Durability: Design rugged, weather-resistant models for outdoor use.Battery Life: Long-lasting battery with solar charging options for remote usage.

User Interface:

Digital Display: Incorporate an easy-to-read digital display for tuning, song information, and notifications.App Integration: Develop a companion app for remote control and customization of settings.

Personalization and Content:

Curated Content: Provide access to curated playlists, podcasts, and radio stations based on user preferences.Local Content: Highlight local radio stations and content for community engagement.

4. Design and Aesthetic

Retro Modern:

Aesthetic Appeal: Blend classic design elements with modern materials and finishes.

Customizable Skins: Offer interchangeable skins and covers for personalization.

Ergonomics:

User-Friendly: Ensure easy-to-use controls and interfaces.Portable Design: Compact and lightweight for easy transport.

5. Potential Challenges and Solutions

Integration Complexity:

Solution: Collaborate with tech companies for seamless integration of voice assistants and smart home systems.

Battery and Power:

Solution: Invest in advanced battery technology and alternative power sources like solar charging.

Market Competition:

Solution: Differentiate through unique features, nostalgic appeal, and superior build quality.

6. Implementation Strategy

Research and Development:

Conduct market research to refine features and design.

Prototype development and testing with target user groups.

Marketing and Launch:

Leverage nostalgia in marketing campaigns.

Utilize social media and tech blogs to reach tech-savvy audiences.

Distribution:

Partner with electronics retailers and online platforms for distribution.

Explore direct-to-consumer models via an e-commerce platform.

7. Conclusion

Reimagining the transistor radio for future users involves merging the best of both worlds: the timeless appeal of classic radio with the smart functionalities of modern technology. By addressing current trends and user needs, the next generation of transistor radios can become a beloved audio device for both nostalgic consumers and tech enthusiasts alike.

References

Statista: Reports on smart speaker and streaming service market trends.
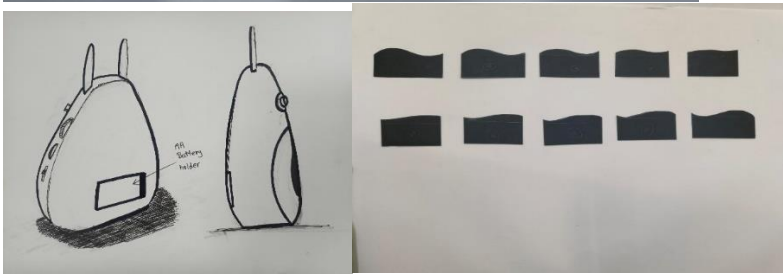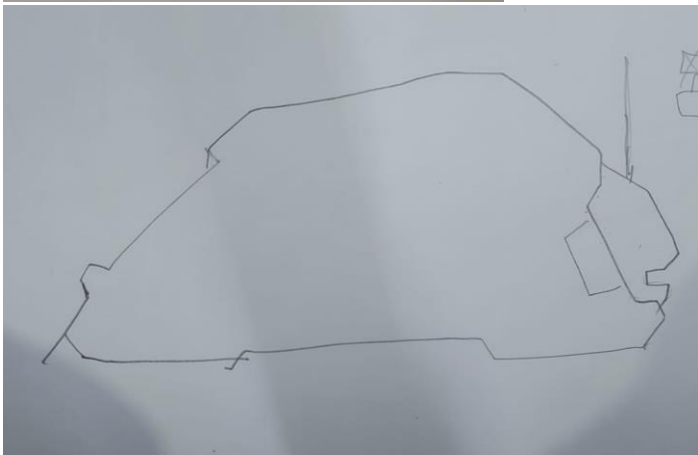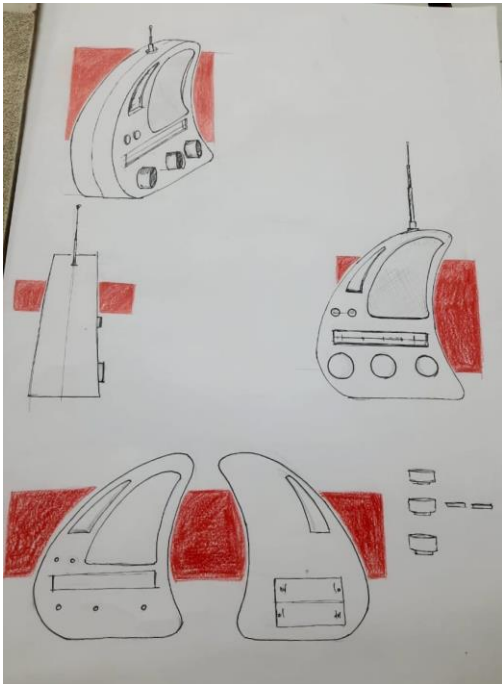
Nielsen: Insights on audio media consumption patterns.
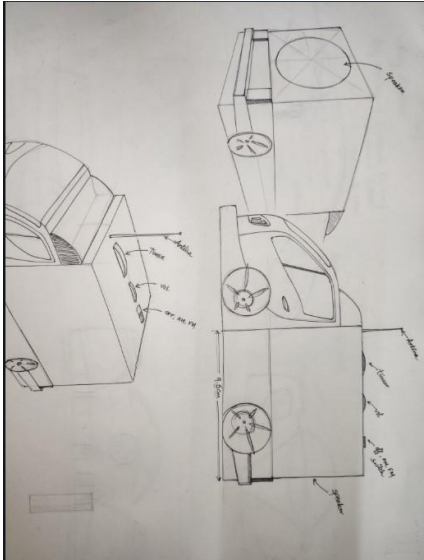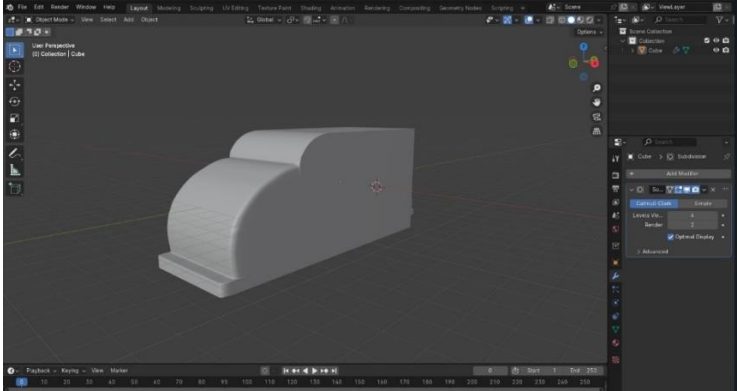
TechRadar: Reviews on portable audio devices.

Market Research Reports: Analysis of the audio entertainment industry.
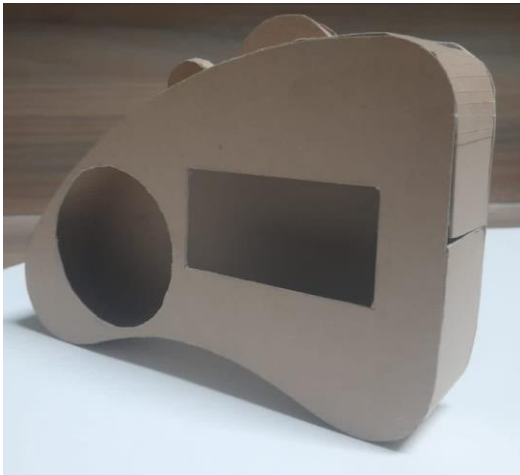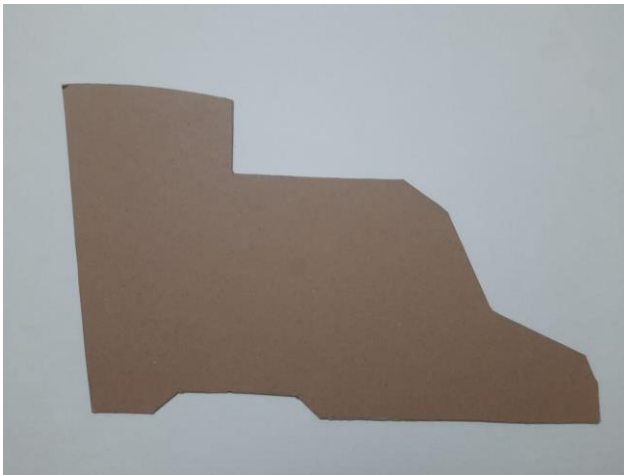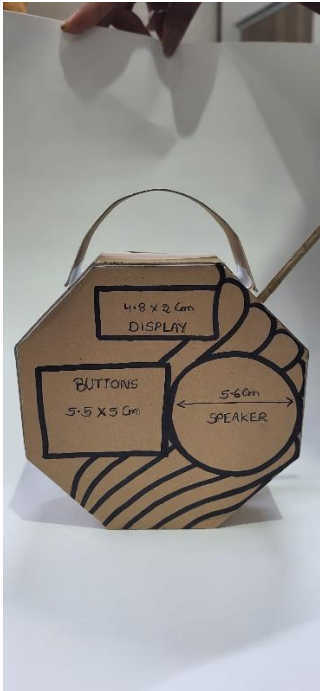
3i Design Sketches:.
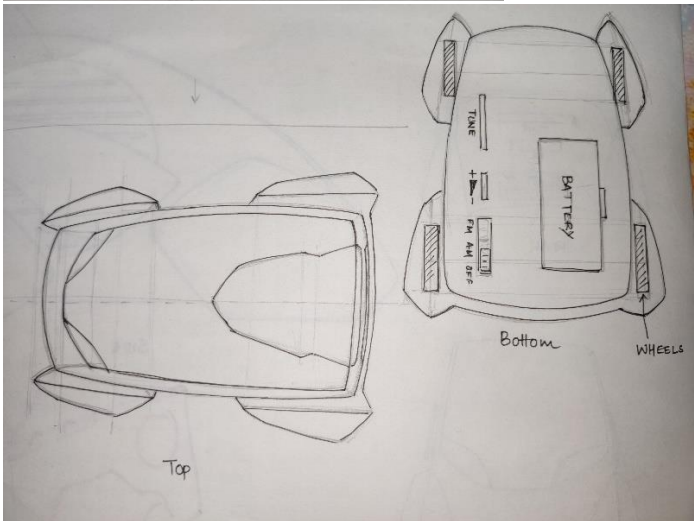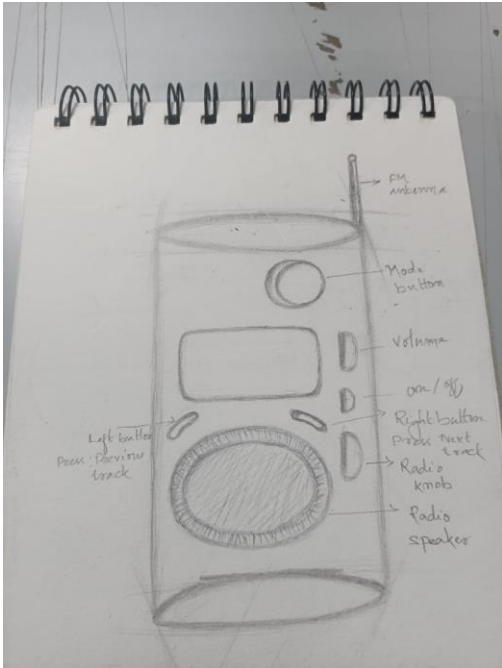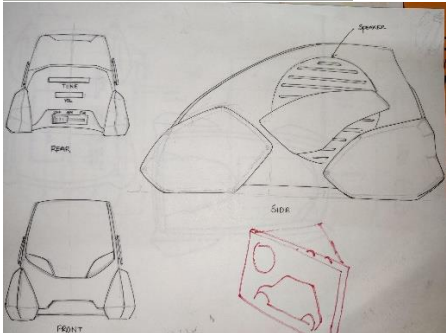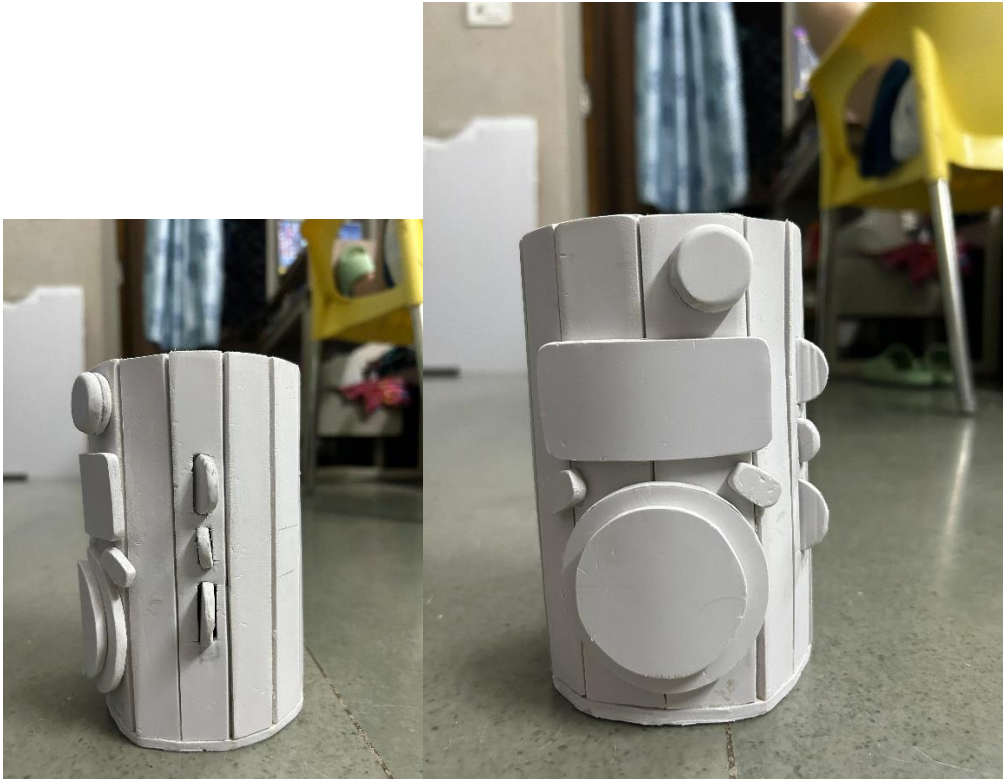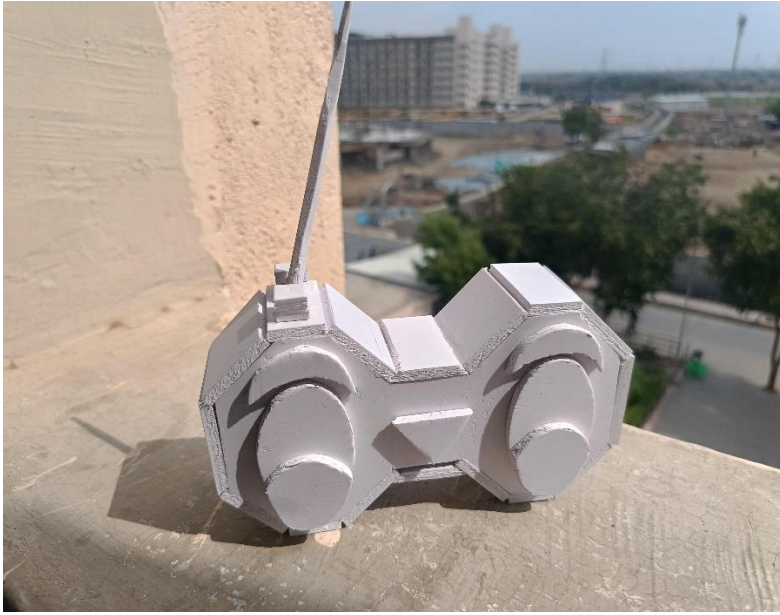
CHAPTER 3j 3D Modeling:

CHAPTER 3k Mockups

card board finn

Tetra pack frooty box
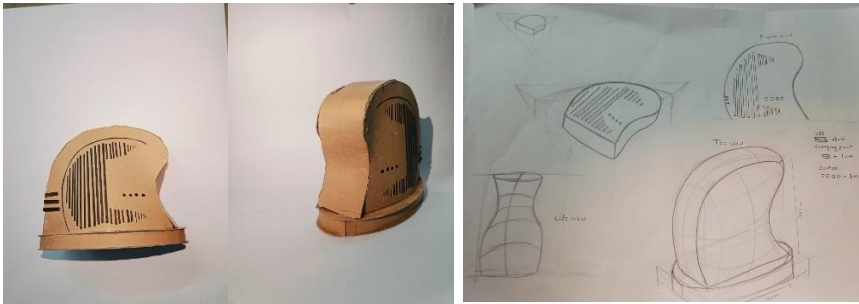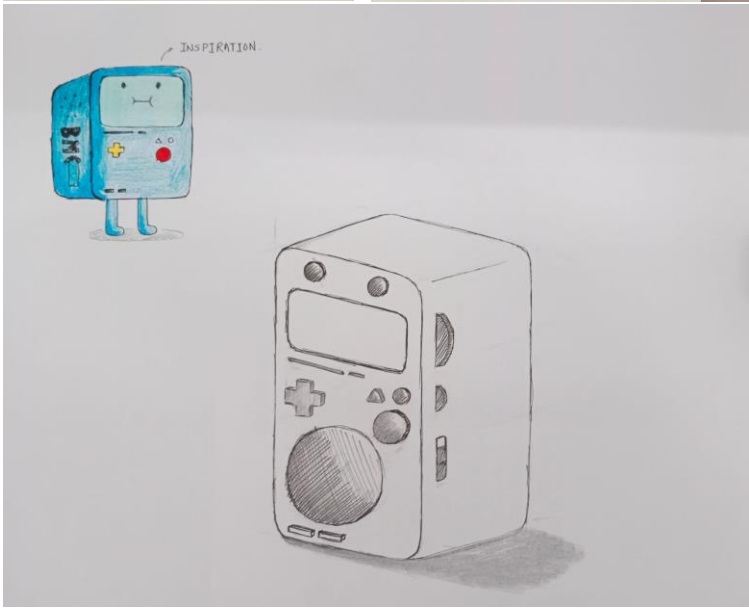
3L Prototypes:.

CONCEPT 1 of 11 watermelon radio
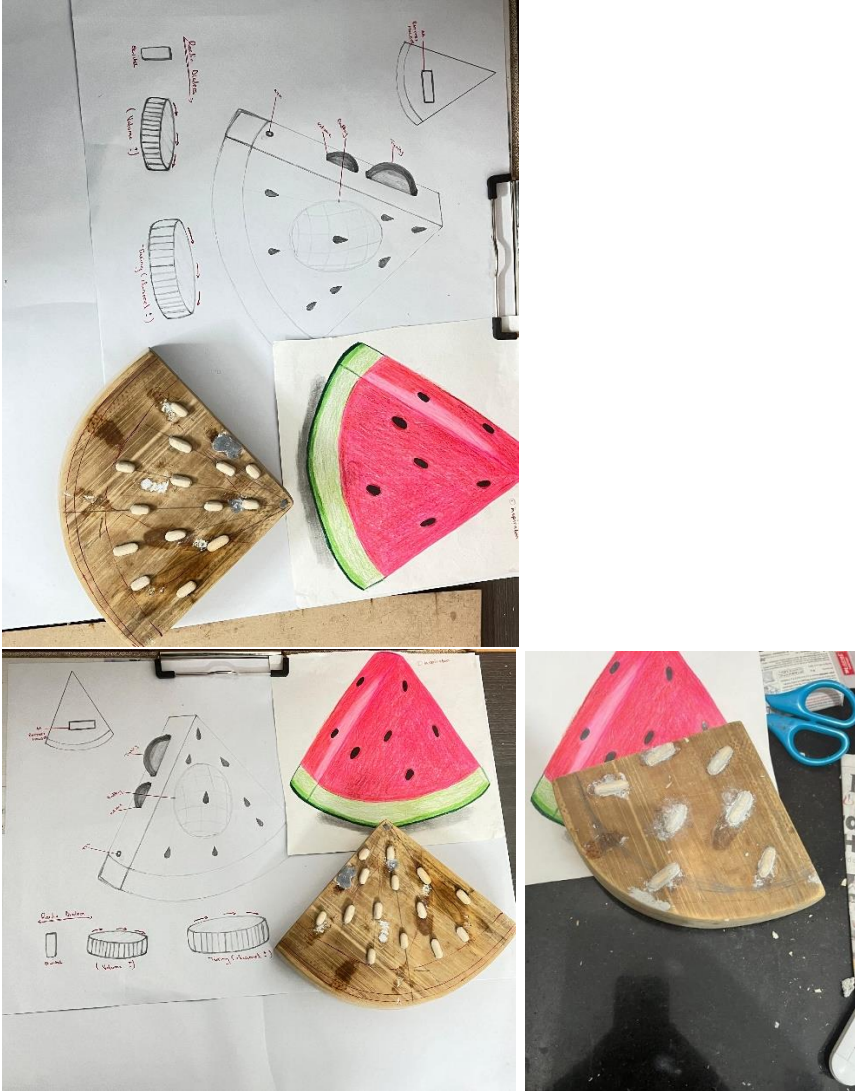
CONCEPT 2 of 11 Triangular Radio

Mould of final product fixing n keeping the positioning of speaker switches
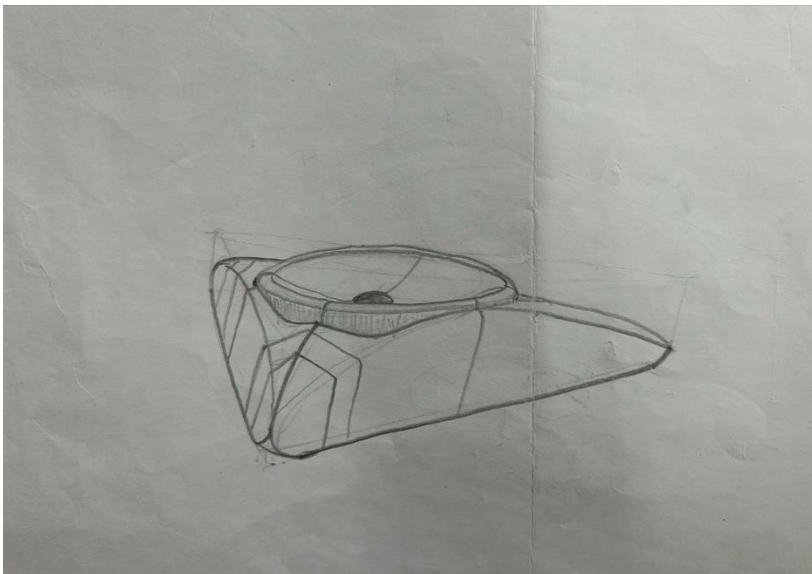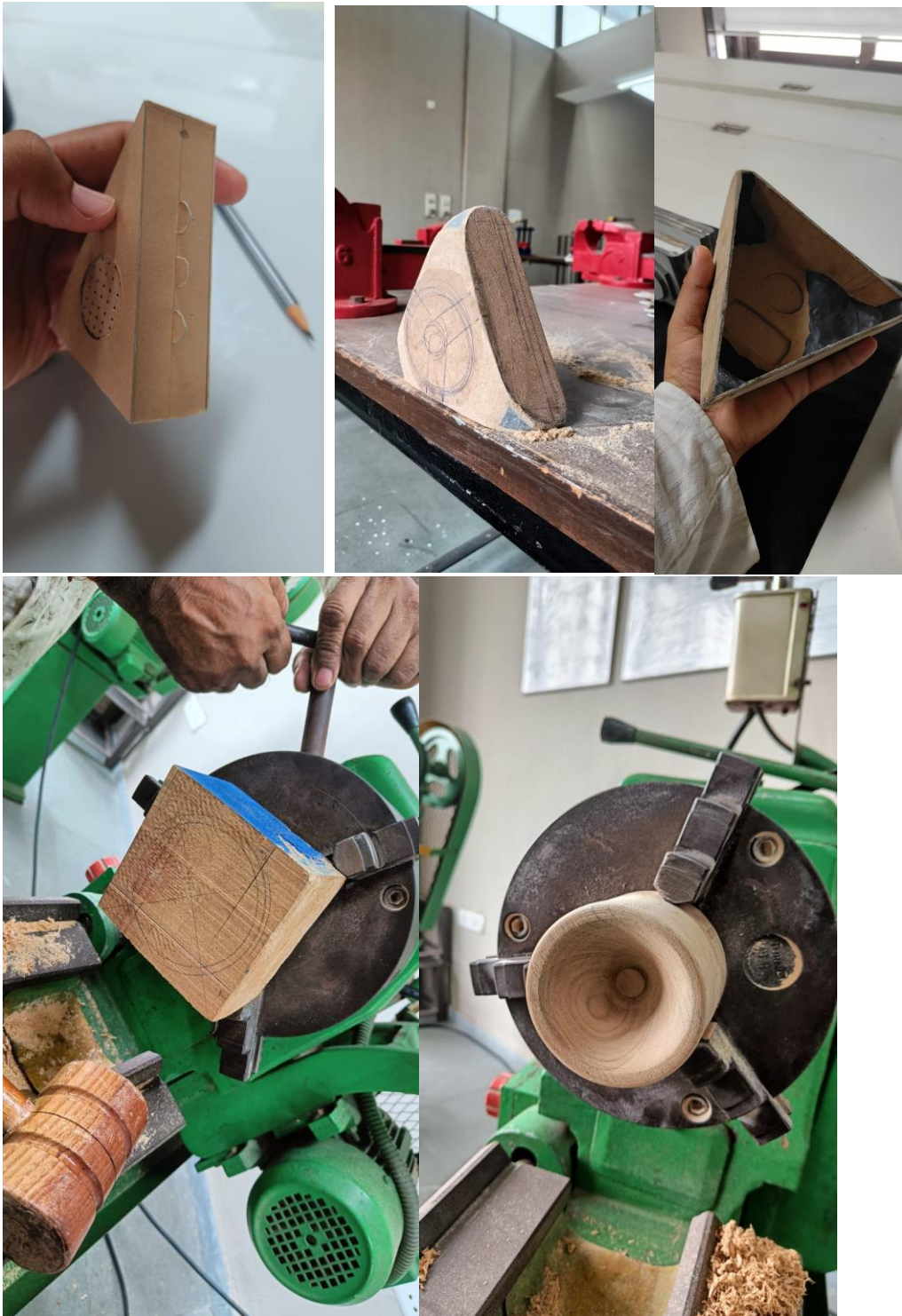
The Manifacturing Process

CONCEPT 3 of 11 wave radio
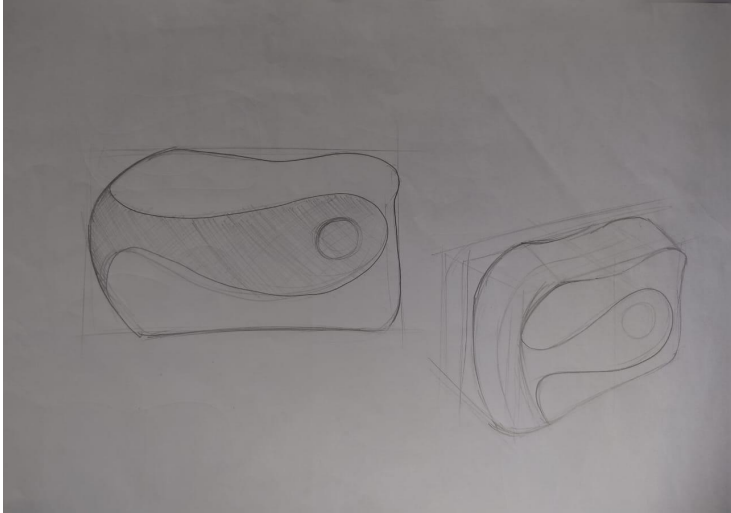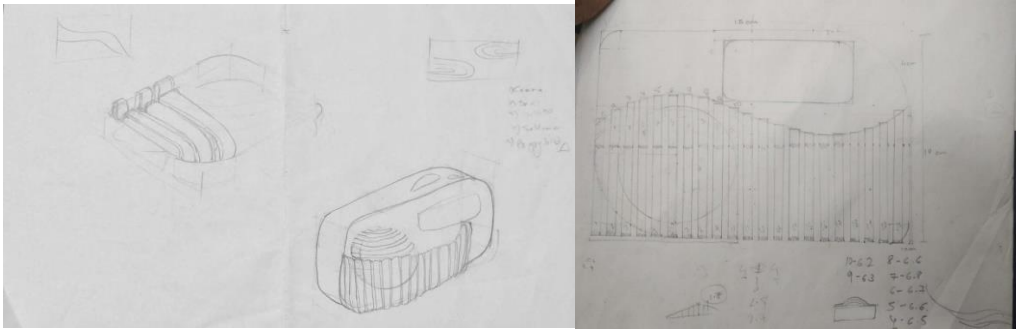
CONCEPT 4 of 11 Camera Radio
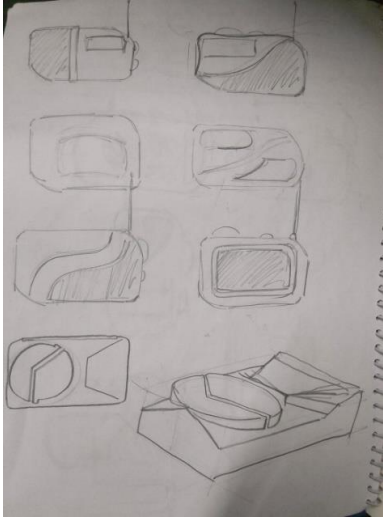
CONCEPT 5 of 11 Shark Fin Radio
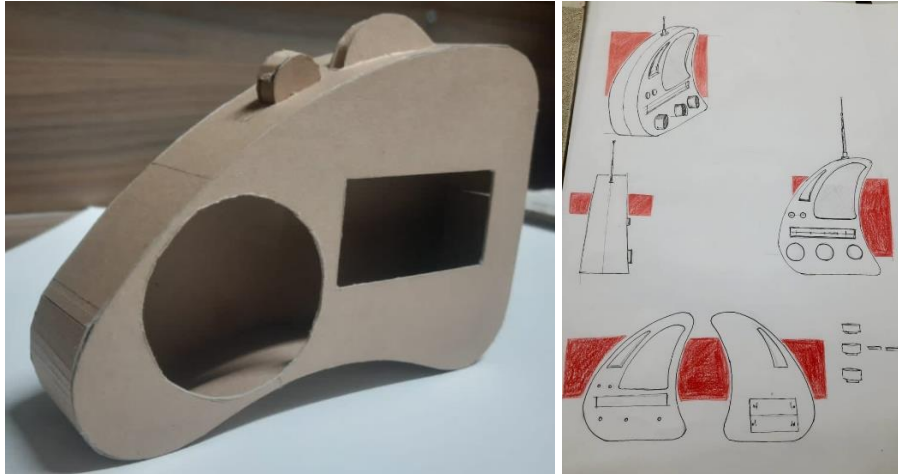
CONCEPT 6 of 11 Brick Block Radio
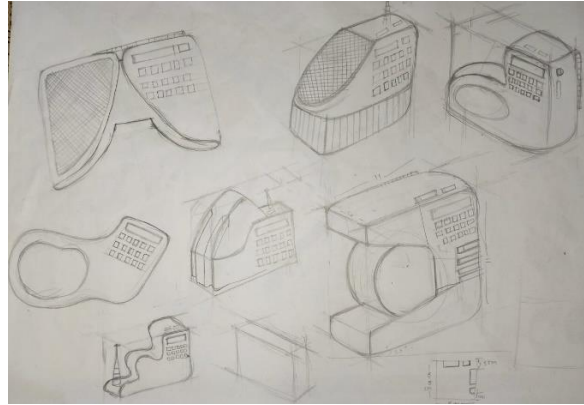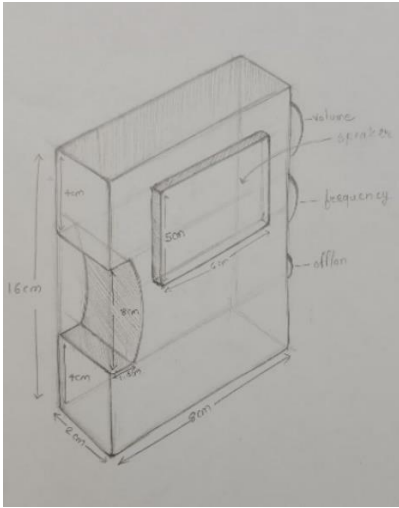
CONCEPT 7of 11 Hot cross Bunn Radio
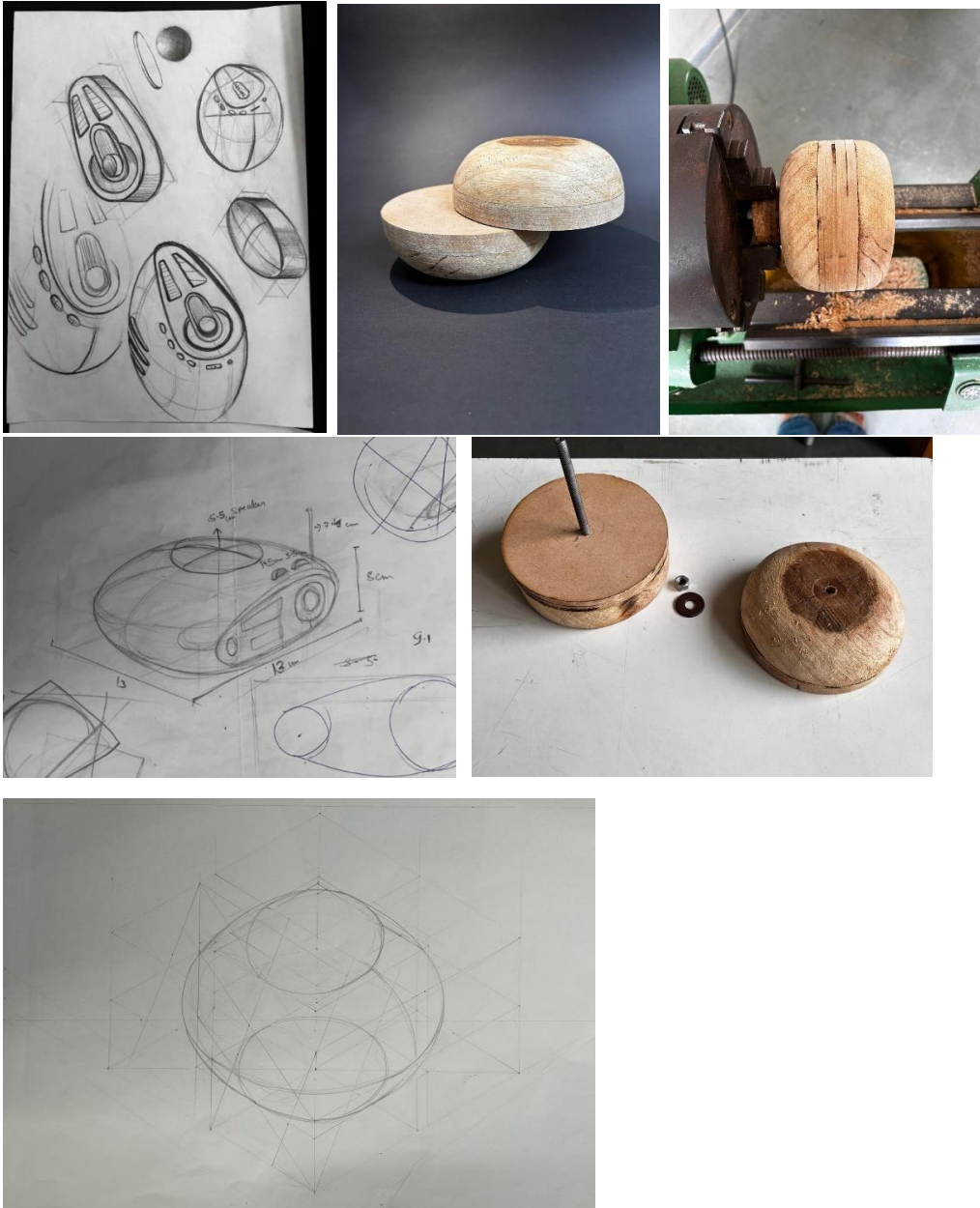
CONCEPT 8 of 11 Cylender Radio

CONCEPT 9 of 11 Studio Ghibli Totoro Radio

Lases cutting and CNC processes were used to get the innitial rough concept forms

The CNC MDF LASER CUTTING SETUP

CONCEPT 10 of 11 Frooty Juice Tetra Pack Box Radio
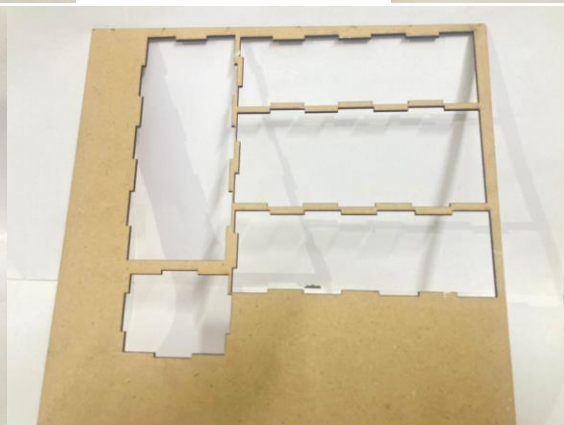
CONCEPT 11 of 11 Travellers Suitcase Radio
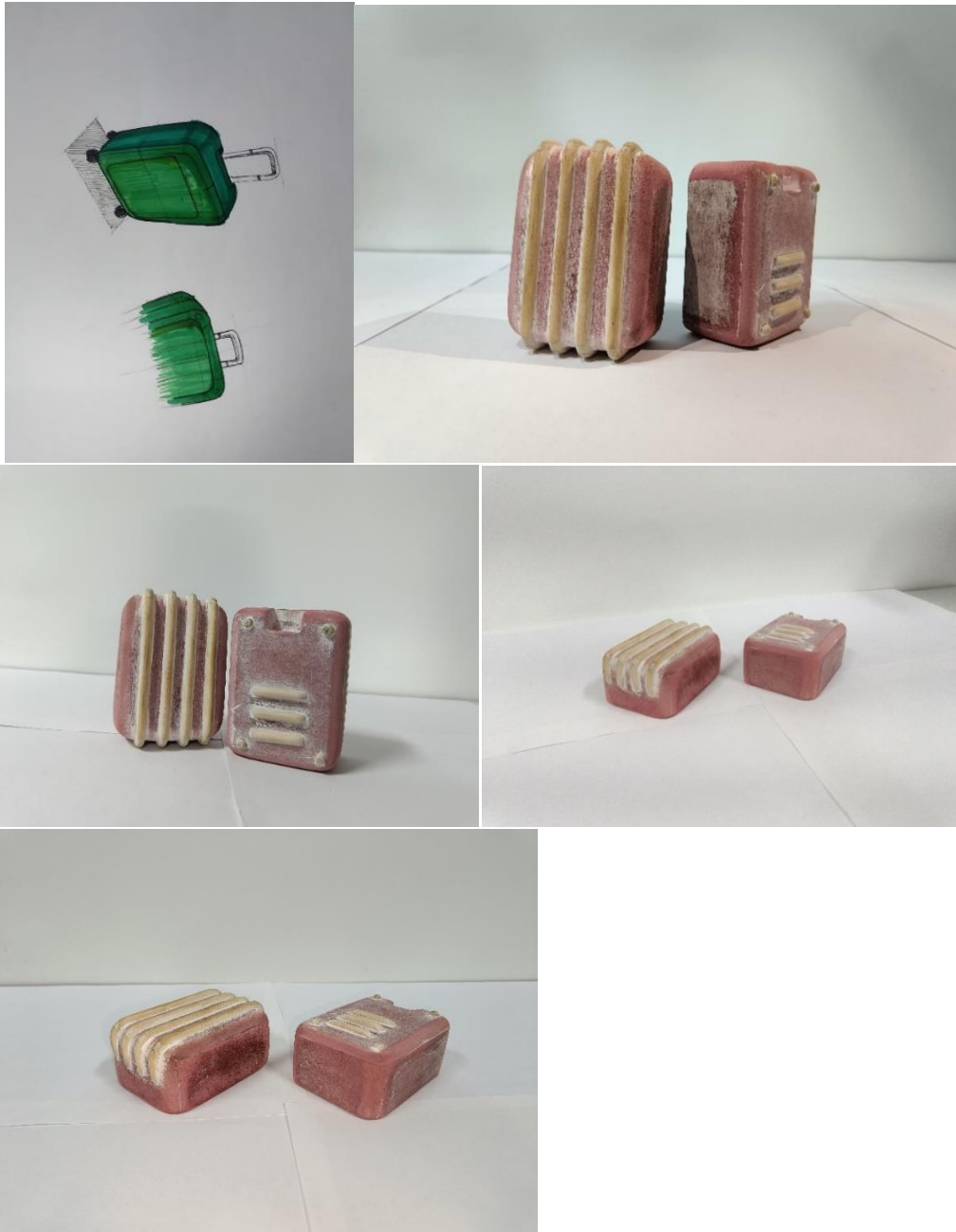
The eleven concept moulds seen above are in the Vacuume forming stage and are in the process of final production process

3m Interface Options User Feedback Structural Testing Design Options & Iteration

₹400

₹320

₹800

₹185

₹500

The feedback based on questions asked by users in shops bus drivers tailor shops has helped in creating user personas and end user requirements the size of the product the placement of the controls and the visibility along with the ergonomics were some of the many factors taken into consideration to shape the concepts

3n Manufacturing Processes
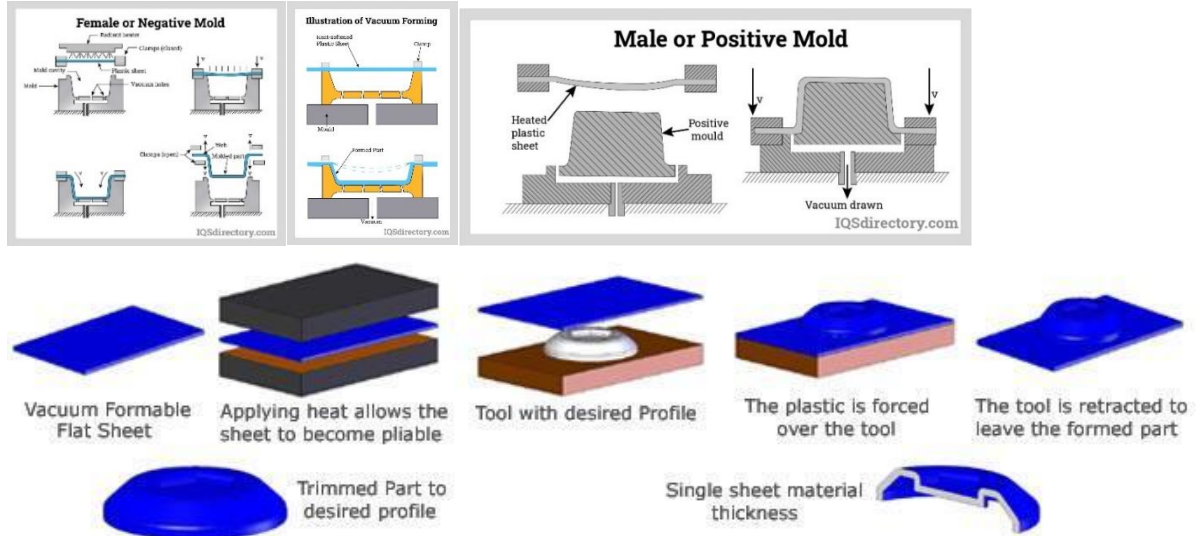
The five main types of the production process

The five main types of the production process are Mass production, Batch production, job production, Just-In-Time production, and flexible manufacturing system. The methods of production in the types stated differ and can be analysed using factors like the manufacturing costs, the capital invested.

What Is Vacuum Forming? Vacuum forming is a manufacturing method used to shape plastic materials. All these thermoplastic and vacuum forming machines played off of an older concept of using vacuums in any kind of casting or moulding process to remove excess air. Trapped air creates weak spots in mouldings which quickly break; applying a vacuum took every bit of air out and ensured a perfect result every time. During the vacuum forming process, a sheet of plastic is heated and then pulled around a single mold using suction. Vacuum forming can be done on a variety of thermoplastics but typically the materials that are used in vacuum forming are as follows:

Polycarbonate (PC) ...
Polystyrene (PS) ...
Polypropylene (PP) ...
Polyvinyl Chloride (PVC) ...
Polyethylene (PE) ...
Polyester Copolymer PETG. ...
Acrylic PMMA. ...
Acrylonitrile Butadiene Styrene ABS.

In vacuum forming, **thermoplastic sheet, 0.60–13 mm thick,** is clamped over a female die impression. The sheet is heated, in situ, by either infrared, quartz lamps, ovens or resistance heaters, to **temperatures in the range 115–165˚C**

The main advantage of vacuum forming over many other large moulding processes are the **lower tooling costs**. As the tooling has little to no moving parts, tools can be machined or cast from a single billet.

What is the 10 10 5 rule for thermoforming?

The 10-10-5 Rule

The next 10 refers to the fact that the temperature must not vary more than 10°F on any of the 10 sheet locations. Each temperature at each location must not vary ±5°F. This ±5°F needs to be held throughout the heating, forming and cooling process.

The Six Stages of Vacuum Forming

Make the mould. Firstly, a mould is constructed in the shape that the plastic will form around.

Place the mould into the vacuum former.

Position the heater above the plastic.

Move the shelf towards the plastic.

Switch the vacuum former on.

Remove the sheet from the vacuum former.

What is the pressure for vacuum forming?

With traditional vacuum forming, the parts are being formed by creating a vacuum on the mold side of the sheet. Since atmospheric pressure is 14.7 pounds per square inch (PSI) this is the theoretical maximum forming pressure available with vacuum forming.

Is vacuum forming expensive?

Less Expensive Than Other Processes: Compared to sheet metal or handlayed fiberglass, thermoformed plastic parts can be much cheaper. And tooling for thermoforming is many times less expensive than tooling for other plastic processes, such as injection, rotational or blow molding.

What is the cycle time of vacuum forming?

1 to 15 minutes

Disadvantages of vacuum forming technology:

Long cycle time (from 1 to 15 minutes); Low accuracy of final products; Post-processing (cropping) required.

Difference between Thermoforming, Vacuum Forming and Pressure Forming

A process of heating a plastic sheet to make it flexible and then contouring in desired molds, trimming the

final product is called thermoforming. Thermoforming is then categorized into two types:

Vacuum forming
Pressure forming
The main difference in these is the number of molds used in their product manufacturing.

Vacuum forming is done using a single mold and a vacuum pump. The heated sheet is placed into the mold, and a vacuum is applied to place it properly into the mold of the desired shape. It is mainly used in the contoured packaging of food and electronics etc. At the same time, pressure forming is done with the help of two molds. The sheet is placed within one mold and then pressed by placing the other mold on it rather than using suction from the vacuum pump. This process enables precise and aesthetically good-looking molds such as appliances casing etc. Furthermore, pressure forming is very suitable for manufacturing the plastic parts that are needed to be shaped evenly and that go deeper into a mold.

3o CIRQUIT BOARD

label: radio pcb,printed circuit board,blank pcb
There is no single process for manufacturing a radio pcb. The manufacturing process depends upon the design and complexity of the radio pcb.
The simplest radio has a single pcb board housed in a plastic case. The most complex radio has many circuit boards or modules housed in aluminum case. Manufacturers purchase the basic components such as resistors pcb, capacitors, transistors, integrated circuits, etc., from vendors and suppliers. The printed circuit boards, usually proprietary, may be manufactured in

house. Many times, manufacturers will purchase complete radio modules from an vendor. Most of the manufacturing operations are performed by robots. These include the printed circuit boards and mounting of the components on the printed circuit board. Mounting of the printed circuit board and controls into the case and some soldering operations are usually done by hand.

1.The blank pcb consists of a glass epoxy resin with a thin copper film cemented to one or both sides. A light sensitive photoresist film is placed over the copper film. A mask containing the electrical circuitry is placed over the photoresist film. The photoresist film is exposed to ultraviolet light. pcb The photoresist image is developed, transferring the image to the copper film. The unexposed areas dissolve during etching and produce a printed circuit on the pcb board.

2.Holes are drilled in designated locations on the printed circuit board to accept the components. Then, the board is pre-soldered by dipping it in a bath of hot solder.
3.Smaller electronic components such as resistors, capacitors, transistors, integrated circuits pcb, and coils are installed in their designated holes on the printed circuit board and soldered to the pcb board. These operations can be performed by hand or by robots.

4.Larger components such as power transformer, speaker, and antenna are mounted either on the pcb or cabinet with screws or metal spring tabs.

5.The case that houses the radio can be made either of plastic or aluminum. Plastic cases are made from pellets that are melted and injected into a mold. pcb Aluminum cases are stamped into shape from sheet aluminum by a metal press pcb.

6.External components not mounted on the pcb can be the antenna, speaker, power transformer, volume, and frequency controls are mounted in the case with either screws, rivets, or plastic snaps. The pcb is then mounted in the case with screws or snaps. The external components are connected and soldered to the pcb with insulated wires made of copper and plastic insulation.

CHAPTER 4 DATA ANALYSIS AND INTERPRETATION
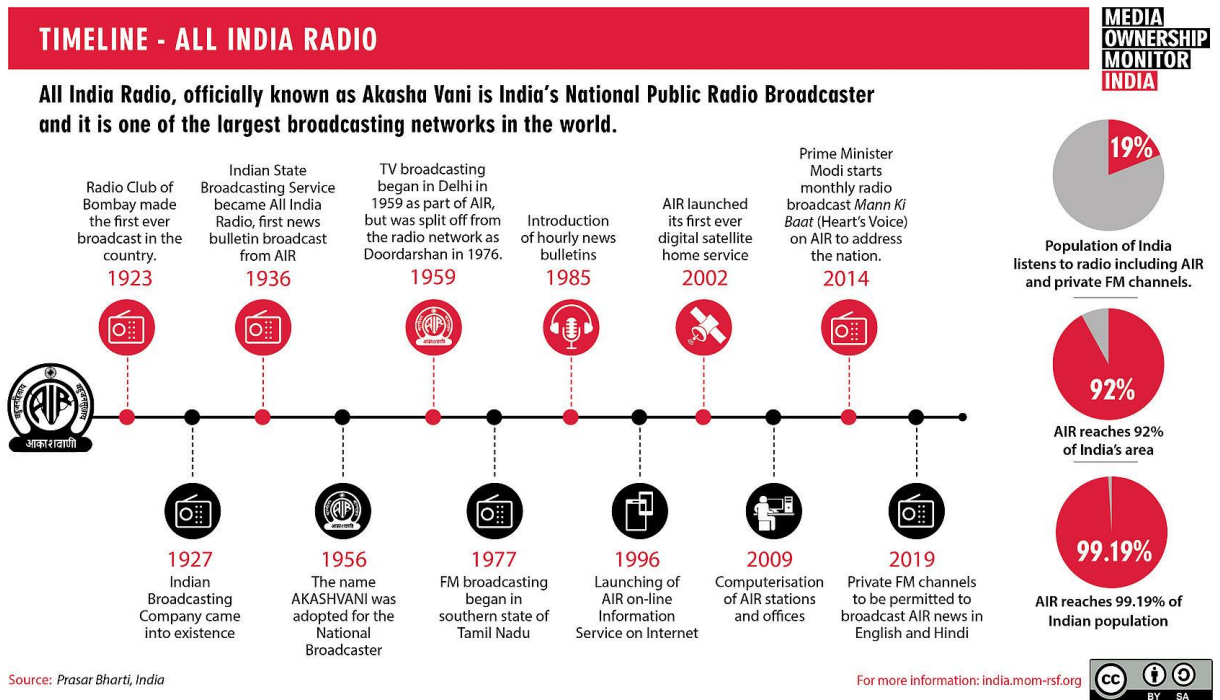
DIAGRAM OF Monopoly of Radio Waves IN INDIA

Radio News Monopoly

Perhaps as the only democracy in the world, India keeps up a state monopoly in radio news. In a country with more than 1.34 billion people, residing in the world's largest democracy, only state-owned All India Radio (AIR) is permitted to broadcast news and current affairs programmes. AIR is a part of the Prasar Bharati Corporation, officially an autonomous body in charge of the national television Doordarshan, and the national radio AIR. Privately-owned broadcasters running FM radio stations have the license to provide almost everything else, like music and entertainment content, except news

INTERNET radio V/S TRADITIONAL radio

1877 Phonograph Cylinder

Innovated by American inventor Thomas Edison, the wax cylinder was the first commercially-produced medium for recording and reproducing sound.

1895 Gramophone Record

The first disc-shaped format, Emile Berliner's gramophone record, made of delicate shellac, became the wax cylinder's main competitor.

1948 Vinyl Record

The vinyl record was more flexible and durable than it's predecessors, and saw the introduction of stereo sound countless innovative and influential covers.

1954 Transistor Radio

Home radio receivers has been popular for decades, but the portable transistor was enormously popular, introducing new music to millions.

1963 Compact Cassette Tape

The compact cassette revolutionised portable music, used in almost every car, and later with the first portable cassette player, Sony's Walkman.

1982 Compact Disc

Co-development by Sony and Philips, the CD was the first digital music format, all but replacing both the vinyl record and the cassette tape. Only recently has it been outsold by digital downloads.

1993 MP3

Currently the most popular music format, distribution of MP3 files exploded in the late 1990s. For the first time, audio recordings no longer required physical manifestation.

Radio waves through Internet

1964
British invasion, the Beatles 1st live TV performance on the "Ed Sullivan Show" resulting in 73 million viewers, 34% of American population!

1971
Jimi Hendrix's rendition of "Star Spangled Banner" is broadcast by Radio Hanoi

1979
Sony Walkman introduced

1981
MTV - play music videos guided by on-air hosts, VJs Influence on audience: censorship ad social activism has been subject of debate for years

1994
WXYC was the first radio station to broadcast online

1992
Satellite Radio Founded

1990
Birth of Internet radio and digital age

1983
Audio-cassette sales in the U.S. surpass vinyl record sales

1996
Sonicwave.com becomes the first Internet radio station

2001
iPod was invented

2003
Apple launches iTunes music store - sells 1 million songs in its first week

2004
Howard Stern signed to Sirius satellite radio

2004
podcasting change radio business preconceptions of audience and distribution

2004
Facebook is Born, along with social media and social networking

2004
BMW drivers get first car audio system with iPod integration. By 2008 90% of cars offer connectivity

2005
Yahoo Inc. announced a new search engine that will search through millions of songs offered on popular Internet music services

2006

2008

2011

2012

Online Radio Has Yet to Conquer the Car

% of American internet user aged 12+ who listen to online/offline radio, by location (as of July 2013)

	In a car	At home	At work	On the go	In a train/bus	Overall
AM/FM Radio	83	57	24	20	18	90
Internet Radio	17	42	23	24	22	53

statista
The Statistics Portal   @StatistaCharts

Source: Edison Research
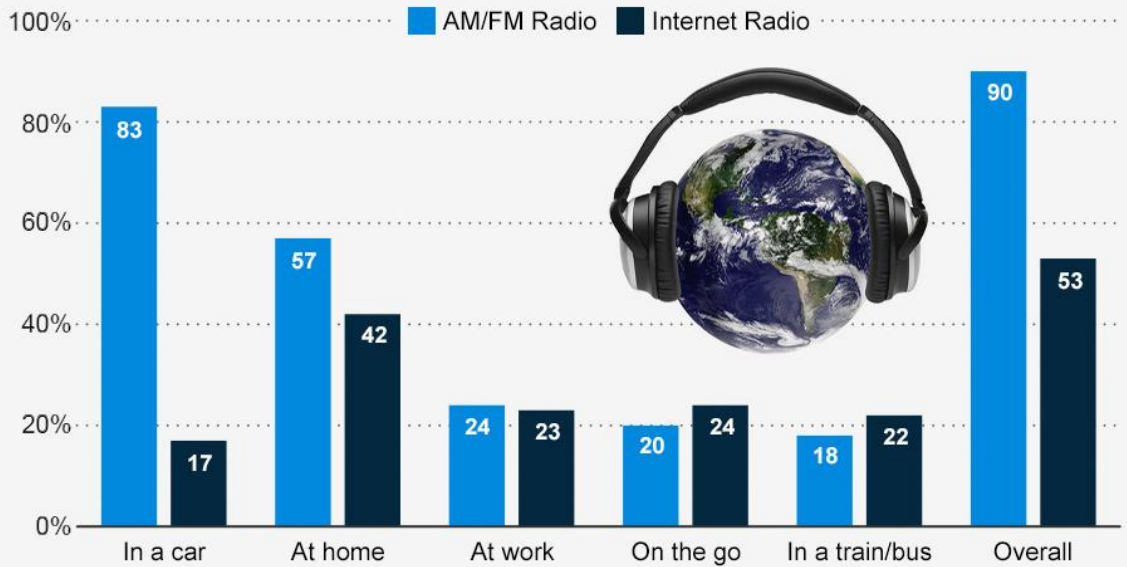
What the electricity is used for

Vaccum cleaners, food mixers, electric tools
15%

Lighting, TV, radio
15%

Heating rooms, heating water
52%

Ovens, kettles, washing machines
18%
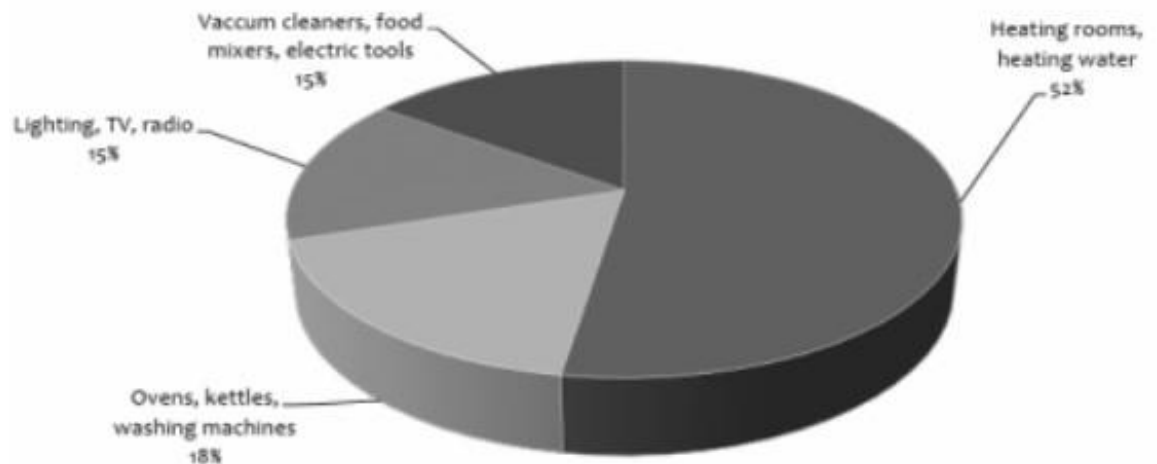
A Pie Chart displaying what people want to listen to on the Radio
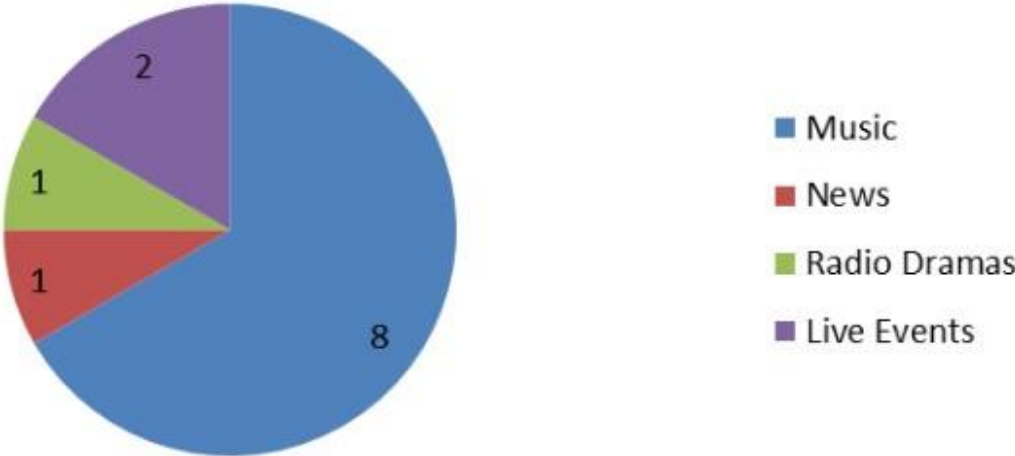
we have got 40% response between the age from 18-30 which include mainly students from a university hostel of 150 students, staff employees, and businessmen on airports . which means the majority population using audio systems is includes between this age group.
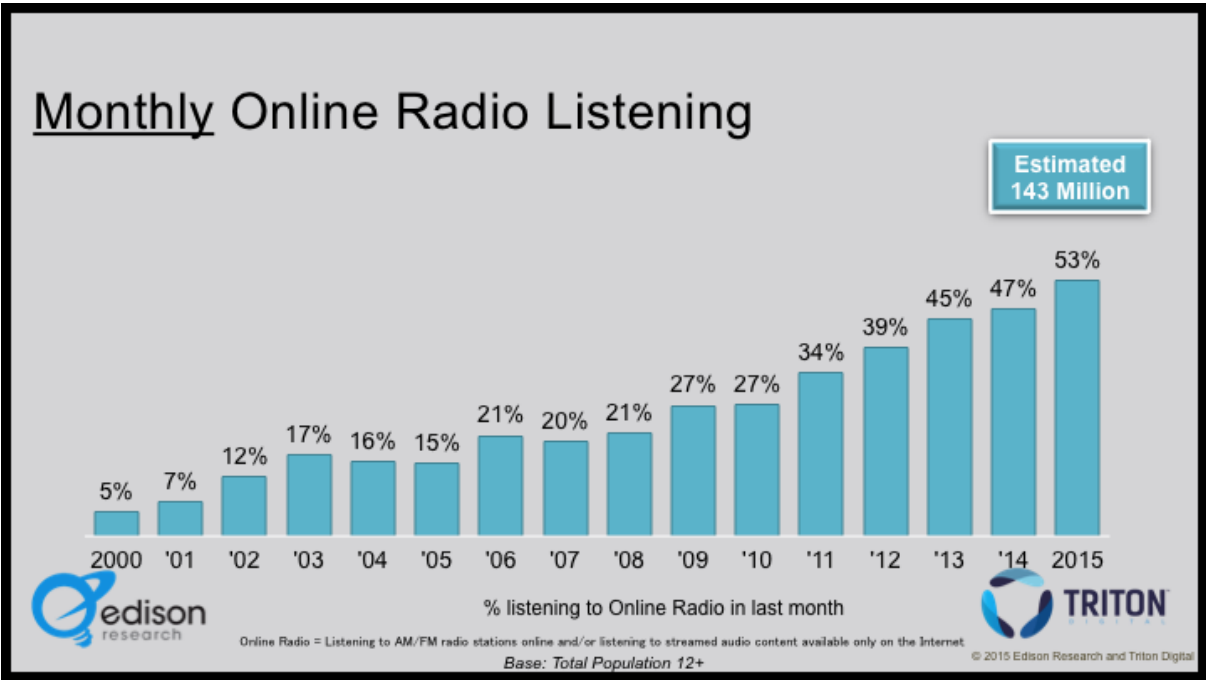
China's audio book market size and forecast (billion RMB)

2016: 2.37
2017: 3.24
2018 (E): 4.54
2019 (E): 6.09
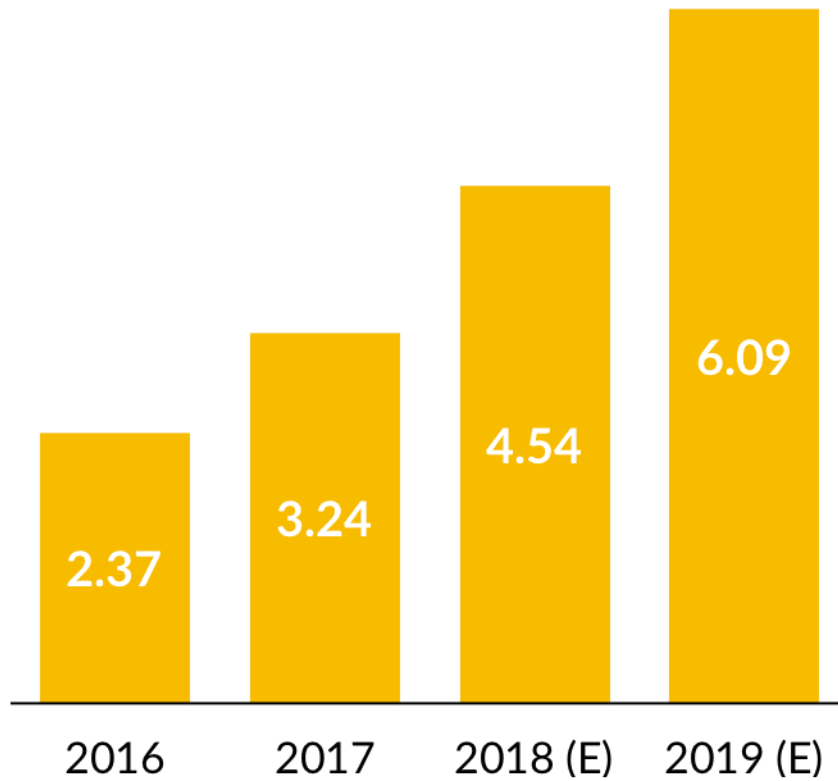
Source: iiMedia Research (April 2018), WalktheChat Analysis

China's paid digital content forecast
(billion RMB)

4.9

23.5

2017

2020 (E)
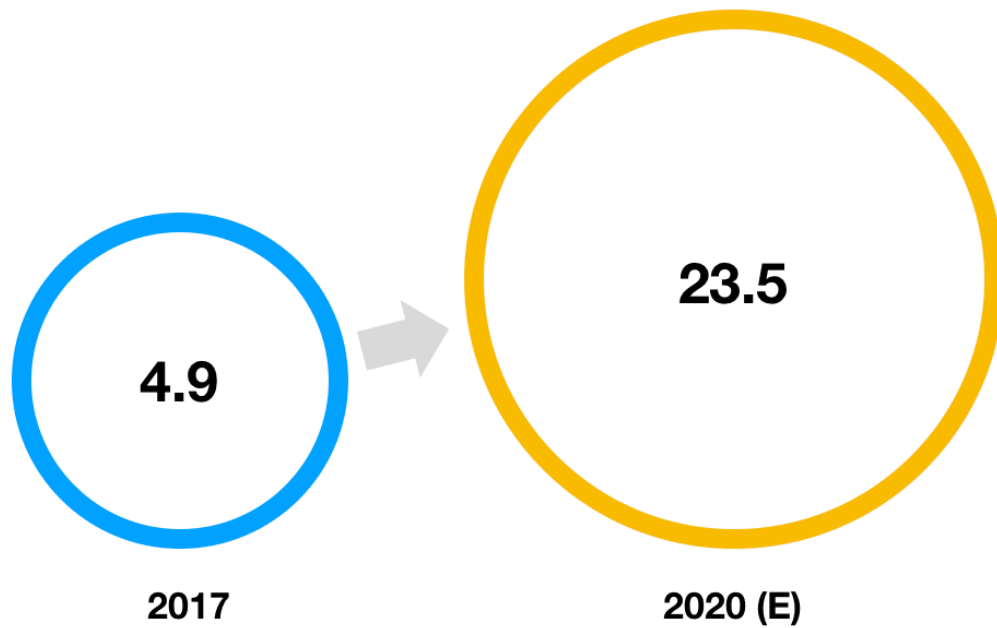
Source: iresearch.cn China Paid Digital Content Report 2018, WalktheChat Analysis

Sportify has claimed it is very difficult to get Asians to pay for entertainment in, India the same has been observed

Monthly Active Users on Major Chinese Paid Digital Content Platforms, Jan - Oct 2017 (million)
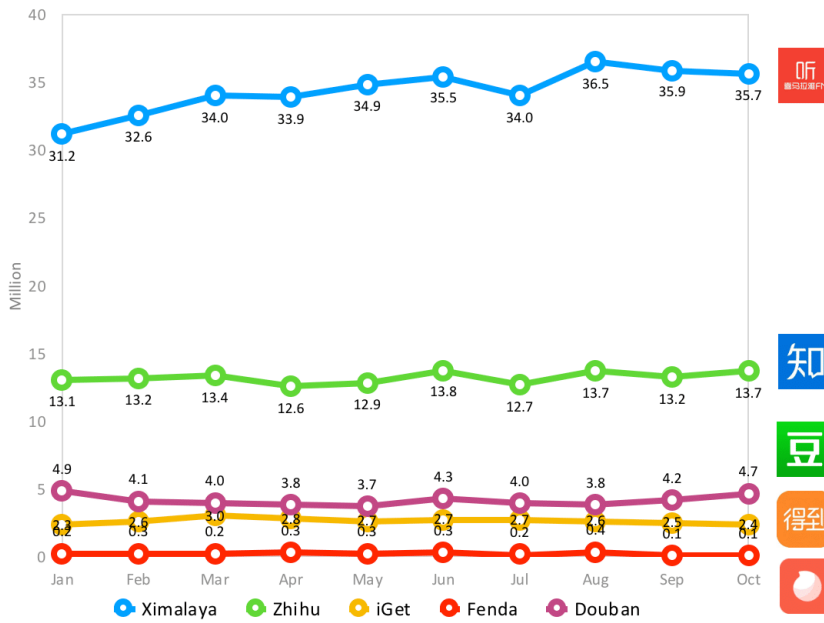
Source: Analysys China Paid Digital Content White Book 2017, WalktheChat Analysis
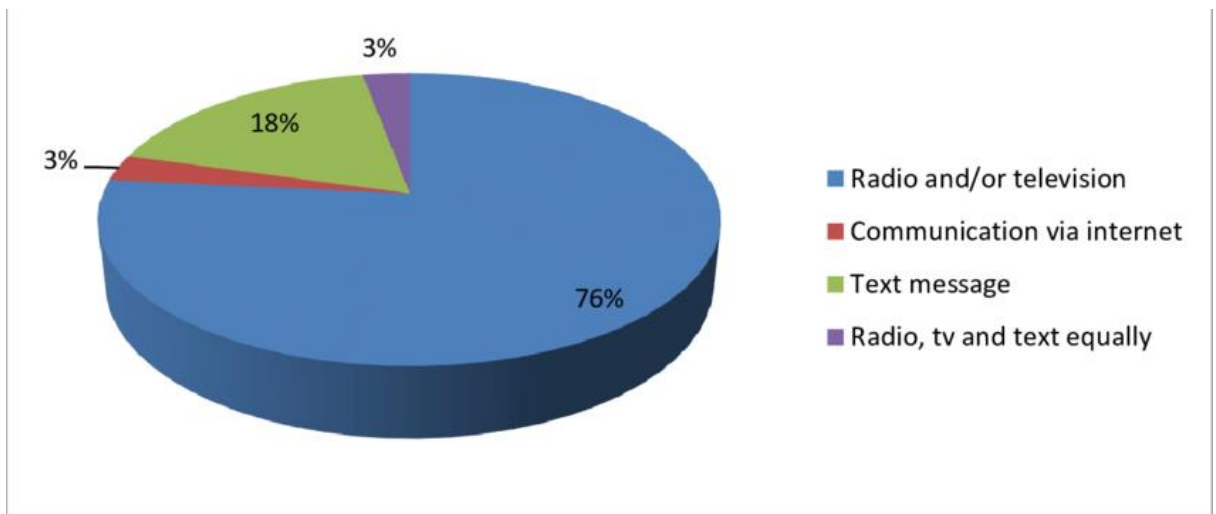
Majority of the income group between 2 lakh and 4 lakh end up wit a television in the house along with smart phones this means they are majority visual persons thus might be using more visual networks.

Geographical distribution of Global Blindness
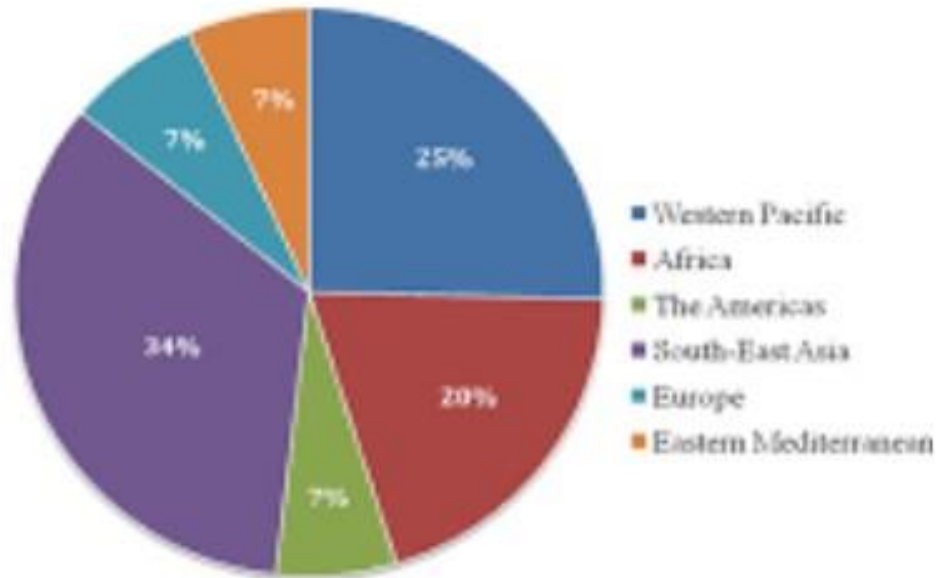
BLIND PEOPLE DEPEND ON AUDIO DEVICES FOR ALL USES AND ENTERTAINMENT

More people depend on radio due to blindness in **ASIA by 34%** percent

Age of Chinese audio app users
(Jan 2018)

>41
(12%)

36-40
(9%)

31-35
(15%)

<24
(38%)

25-30
(27%)
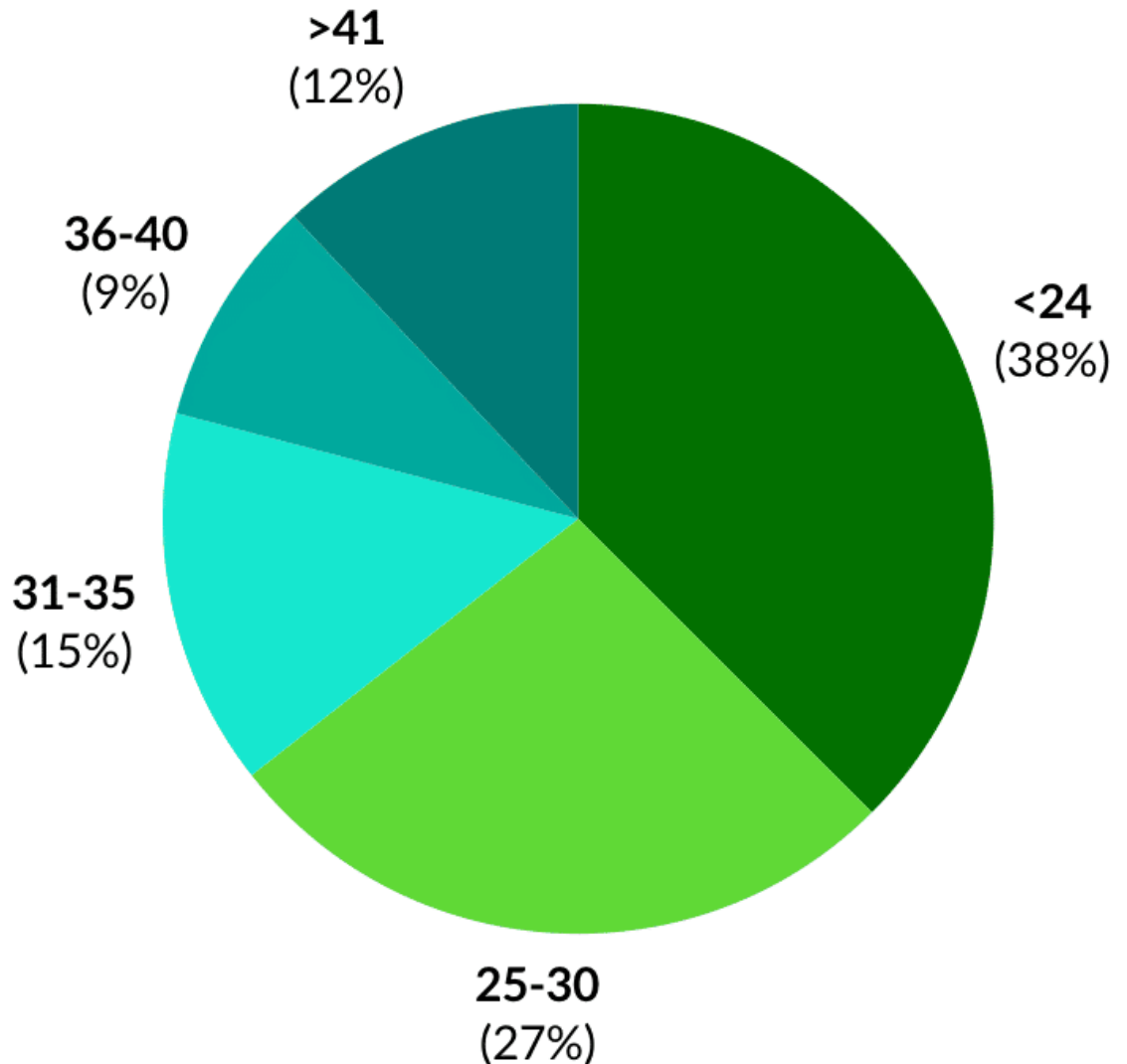
Source: iiMedia, WalktheChat Analysis

Like most countries even in China It Has been observed the average uswer is young in age.

Gender of audio app users in China
(Jan 2018)

Female
47%

Male
53%
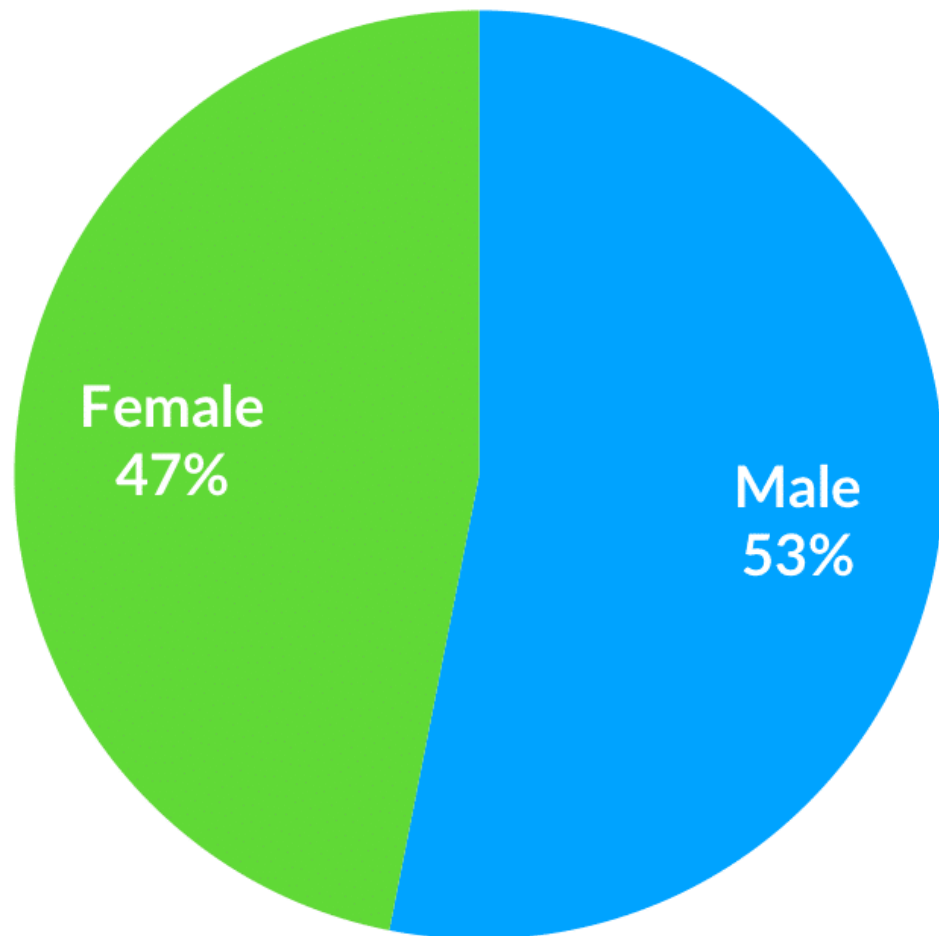
Source: iiMedia, WalktheChat Analysis

Due to a lot of jobs that require the employee to work as transporters and operators or a system controller more men are seen to work with audio infotainment .

Best selling audio content in China by category (Nov 2017)

Dating (1%)
Career (9%)
Health (3%)
Art (5%)
Commercial (9%)
Skills (11%)
Finance (11%)
Self Development (13%)
Culture (23%)
Parenting (15%)
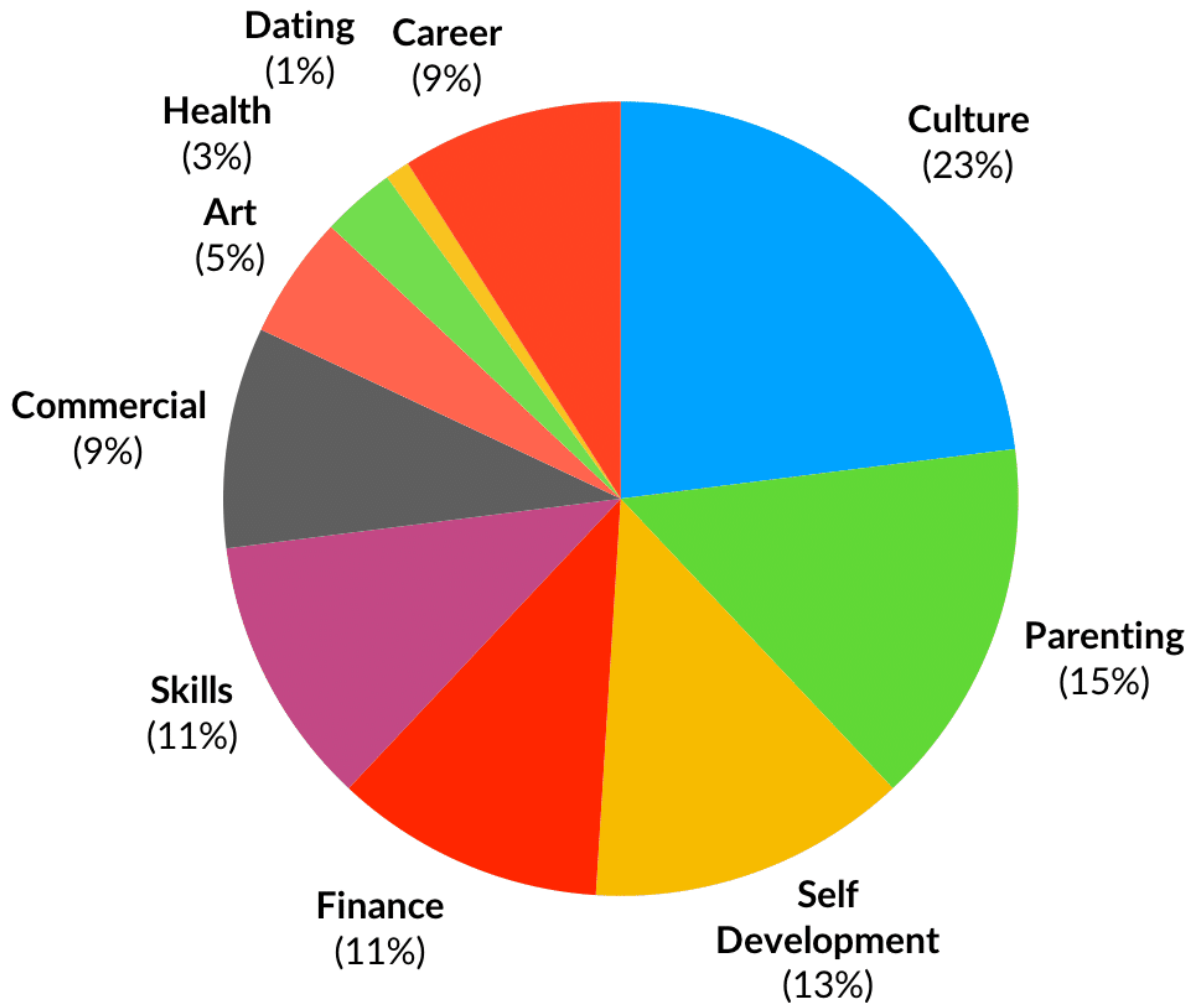
Source: Analysys, Xinzhibang, WalktheChat Analysis

The user is divided in their requirement due to many factors like for example age and location and it is to be seen how the infotainment industry is providing the content that is already structured because of the existing and well studied user persona that has developed over the last 30 years this chart is Based on the model seen in China ,we are able to make projerctions about the indian market .

Penetration rate of audio apps in China, Jan 2018

5.12%	**2.29%**	**2.18%**	**0.53%**
Ximalaya 喜马拉雅	Qingting 蜻蜓	Lizhi 荔枝	Kuwo Tingshu 酷我听书
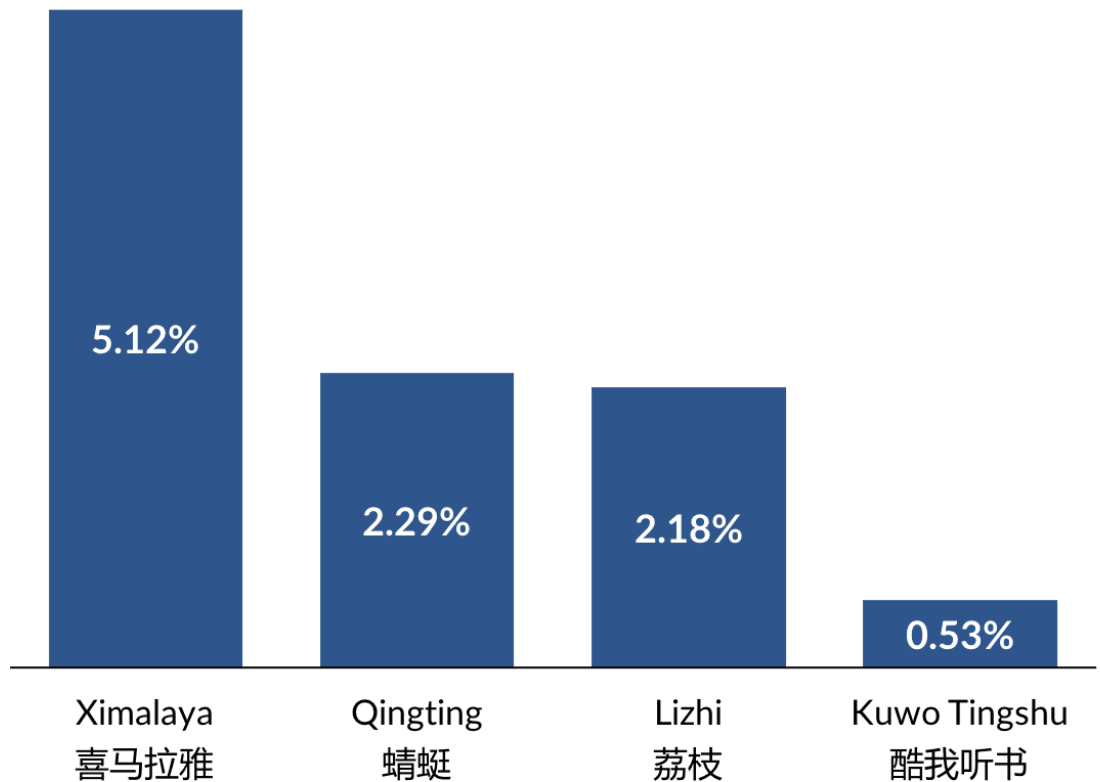
Source: iiMedia Research, WalktheChat Analysis

Based on the model seen in China And USA we are able to make projerctions about the predictability of the indian market purly looking at Trends as seen in the international market today

Chinese audio apps with top 5 weekly active penetration rates (Q1 2018)

APP	Weekly Active Penetration Rate	Weekly Opens Per User
Ximalaya 喜马拉雅	1.16%	36.5
LRTS 懒人听书	0.36%	73.5
Qingting 蜻蜓	0.28%	38.3
QQ 企鹅	0.14%	59.5
Zhangyue 爱读掌阅	0.13%	41.9

Source: Cheetah Global Lab (2018), WalktheChat Analysis

Best selling audio content by platform (Nov 2017)

Douban Time (2%)

Others (8%)

36 Kr 36氪 (2%)

Hetao Live 核桃 (7%)

Qingting 蜻蜓 (9%)

iGet 得到 (15%)

Ximalaya 喜马拉雅 (57%)
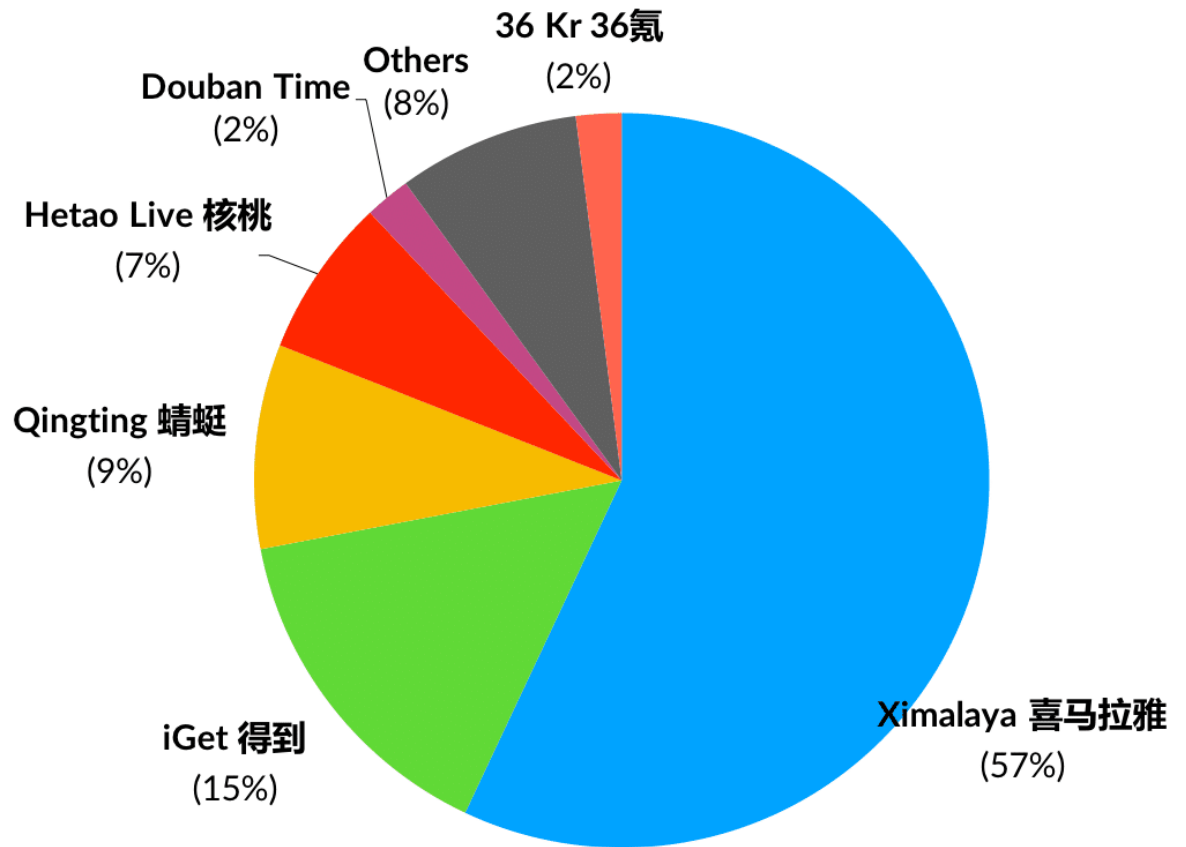
Source: Analysys, Xinzhibang, WalktheChat Analysis

Trends as seen in the international market today

FOR AVERAGE USER IN INDIA THERE ARE DIFFERENT USES AND NOT JUST ENTERTAINMENT

Why are users listening on audio platforms? (Apr 2018)
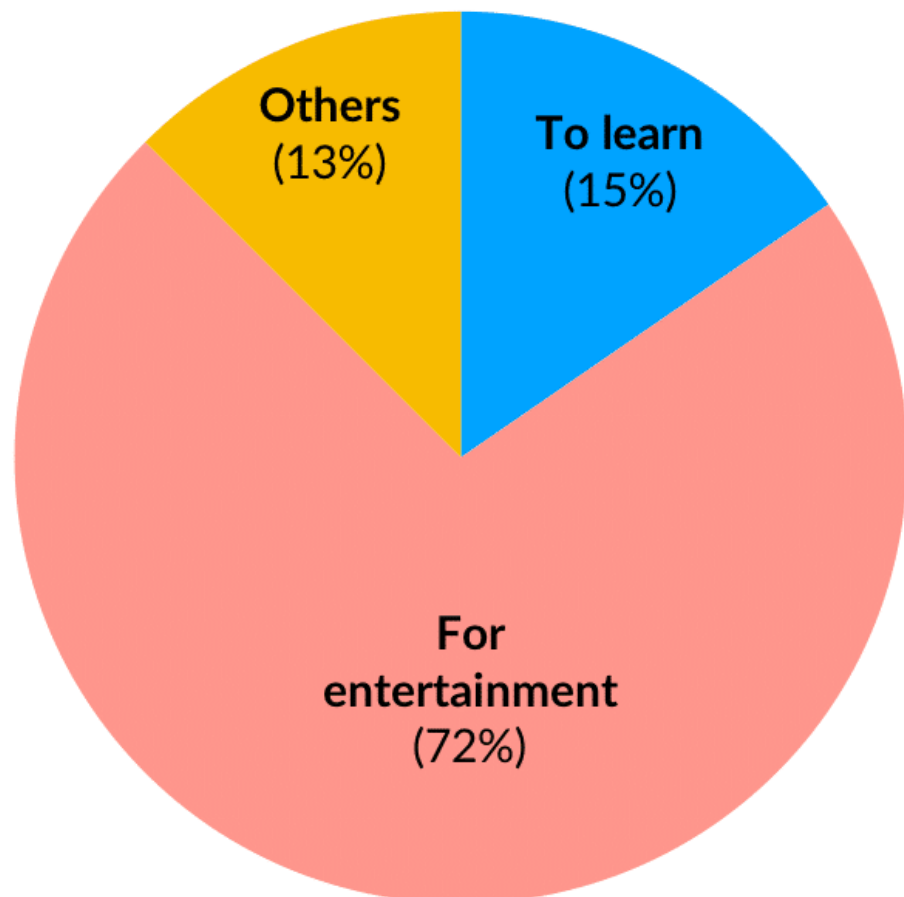
Others (13%)

To learn (15%)

For entertainment (72%)

Source: iiMedia, WalktheChat Analysis
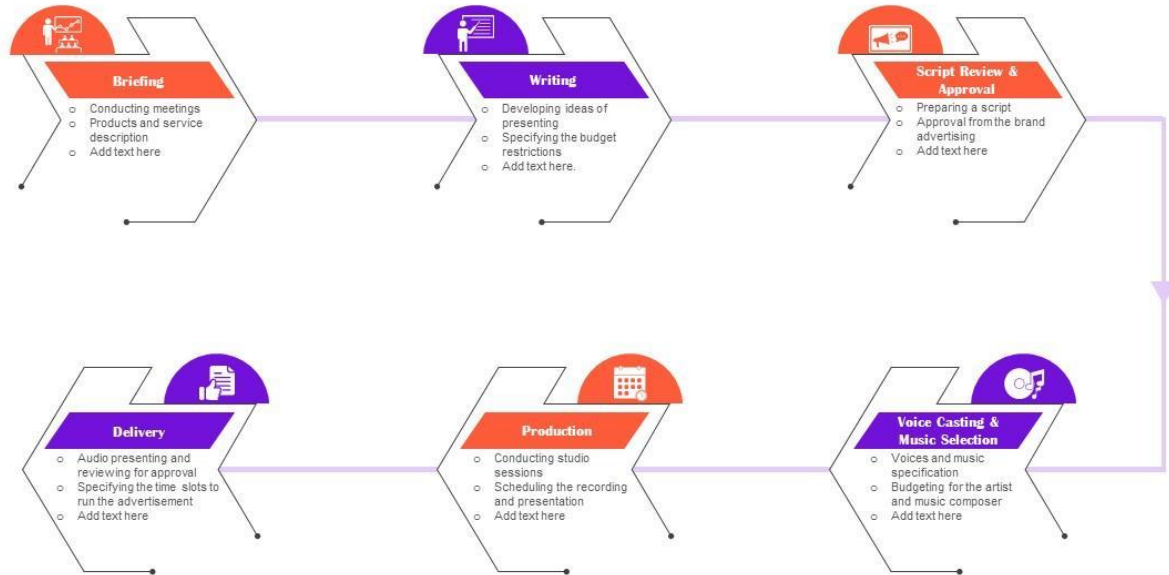
THE STUDT OF HOW THE AUDIO APP FUNCTIONS

04:51 ■ Live TV

02:43 ■ Radio

01:25 ■ Smartphone

01:06 ■ Internet on a PC

00:33 ■ Timeshifted TV

00:13 ■ Game Console

00:09 ■ DVD / Blu Ray

00:07 ■ Multimedia Device
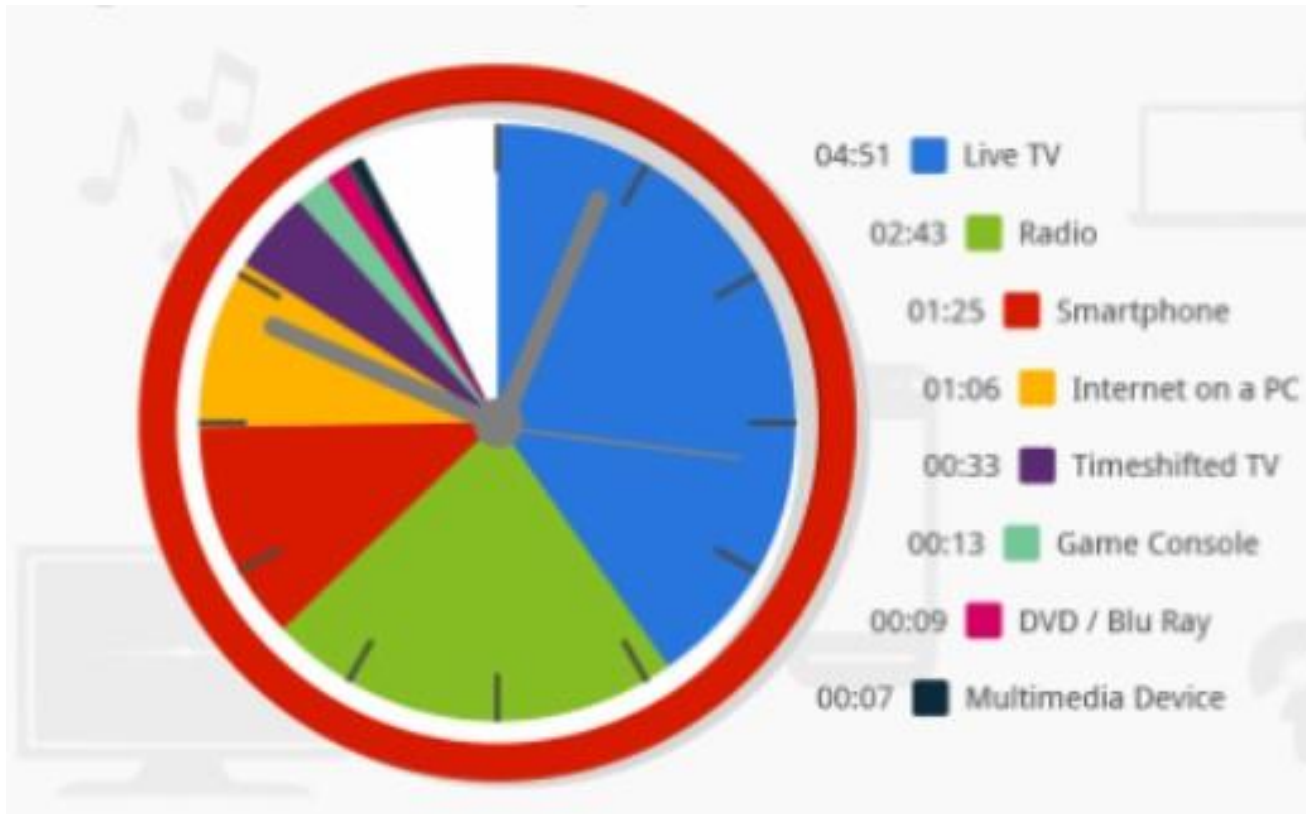
ALL PEOPLE IN DRIVING AND TRANSPORTATION ARE DIVIDED BETWEEN RADIO AND BLUETOOTH SPEAKER AND FM STATIONS

AM/FM Listening Is Slowly Trending Down, Lowest Among the Youngest Generations

% Who Listen to AM/FM Radio (On Any Device) For One Hour or More Each Weekday
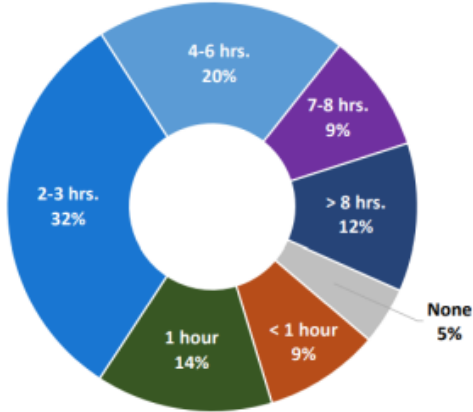
"How many hours on an average WEEKDAY (Monday-Friday) do you use/listen to any local AM/FM radio stations (using a regular radio OR audio stream on any device)?"

jacobsmedia.com | @fnjacobs | #TS2022
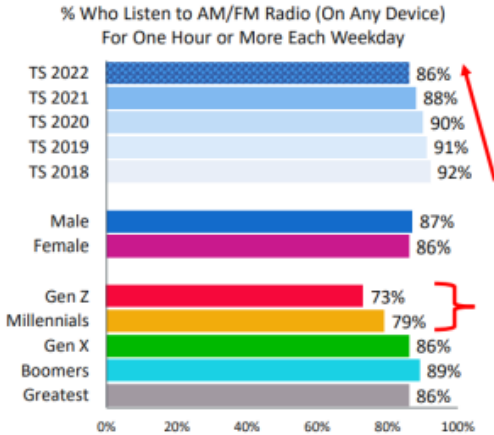
TECHSURVEY 2022 JACOBS MEDIA

IT IS A TREND IN THE UNITED STATES THAT IS PRIDICTED TO START REVERSING BY 2026

In a First, Bluetooth Overtakes FM Radio as the Most Important Feature Among New Car Buyers
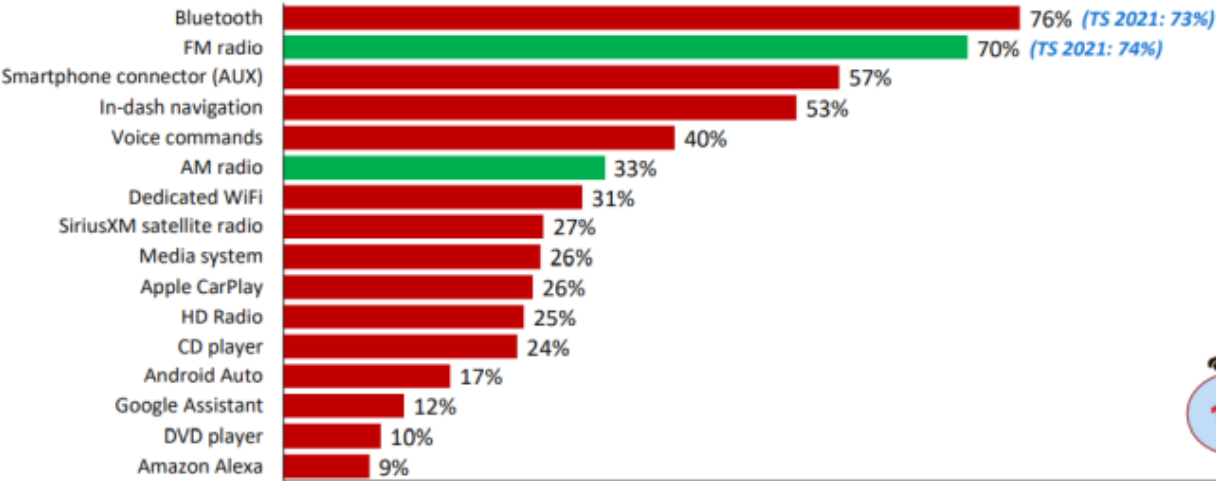
This chart clearly shows the need for the audio system app and gadgets in todays market

With Each Passing Year, the Appeal of Music on the Radio Is Becoming Secondary to the Power of its Personalities

I Like Particular DJs/Shows/Hosts — **I Want to Hear My Favorite Songs/Artists**

	TS 2014	TS 2015	TS 2016	TS 2017	TS 2018	TS 2019	TS 2020	TS 2021	TS 2022
I Want to Hear My Favorite Songs/Artists	70%	67%	64%	66%	60%	57%	55%	55%	55%
I Like Particular DJs/Shows/Hosts	57%	55%	58%	56%	58%	59%	59%	61%	62%
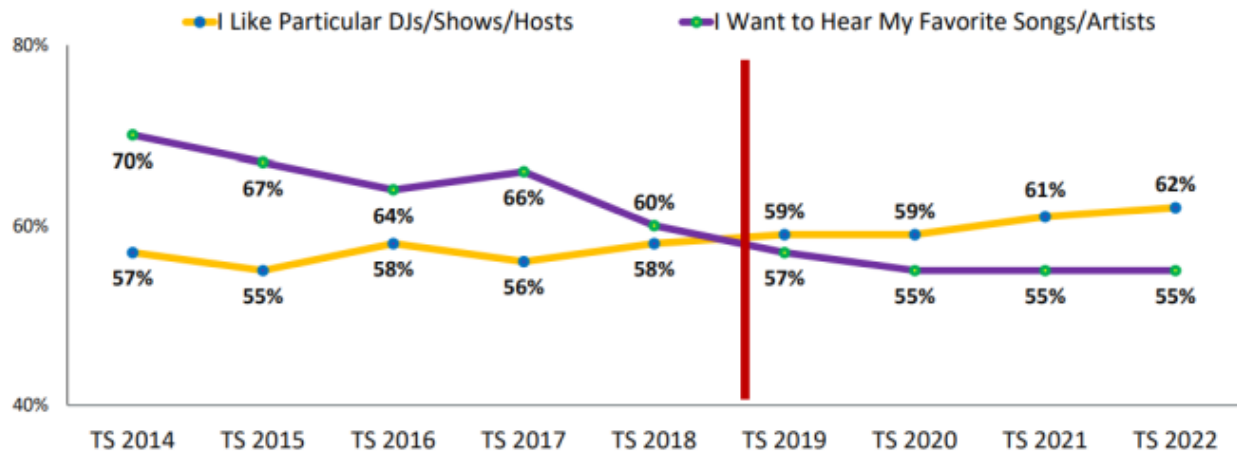
As observer during this survey Majority of RJ dominate and are held in high regard and lesser is music as it is held with lower significance thus, we can say that the method of interaction with the listener has changed and it provides a new way to provide this services than older ways of presentation.

Why AM/FM Radio?

Reason	%
Easiest to listen to in car	65%
DJs/Hosts/Shows	62%
It's free	59%
Hear favorite songs/artists	55%
In the habit of listening	54%
Feel a connection w/ radio	51%
Like to work with radio	47%
Keeps me company	44%
To be informed about the news	36%
What's going on locally	35%
Get in a better mood	35%
To be informed in an emergency	33%
Enjoy talk shows	32%
Escape pressures of everyday life	29%
Weather	26%
Discover new music/new artists	23%
Music surprises	23%
Traffic	23%
Charitable/community events	20%
Sports	15%
To win prizes	11%

From data 65 % there are enough listeners using internet radio app
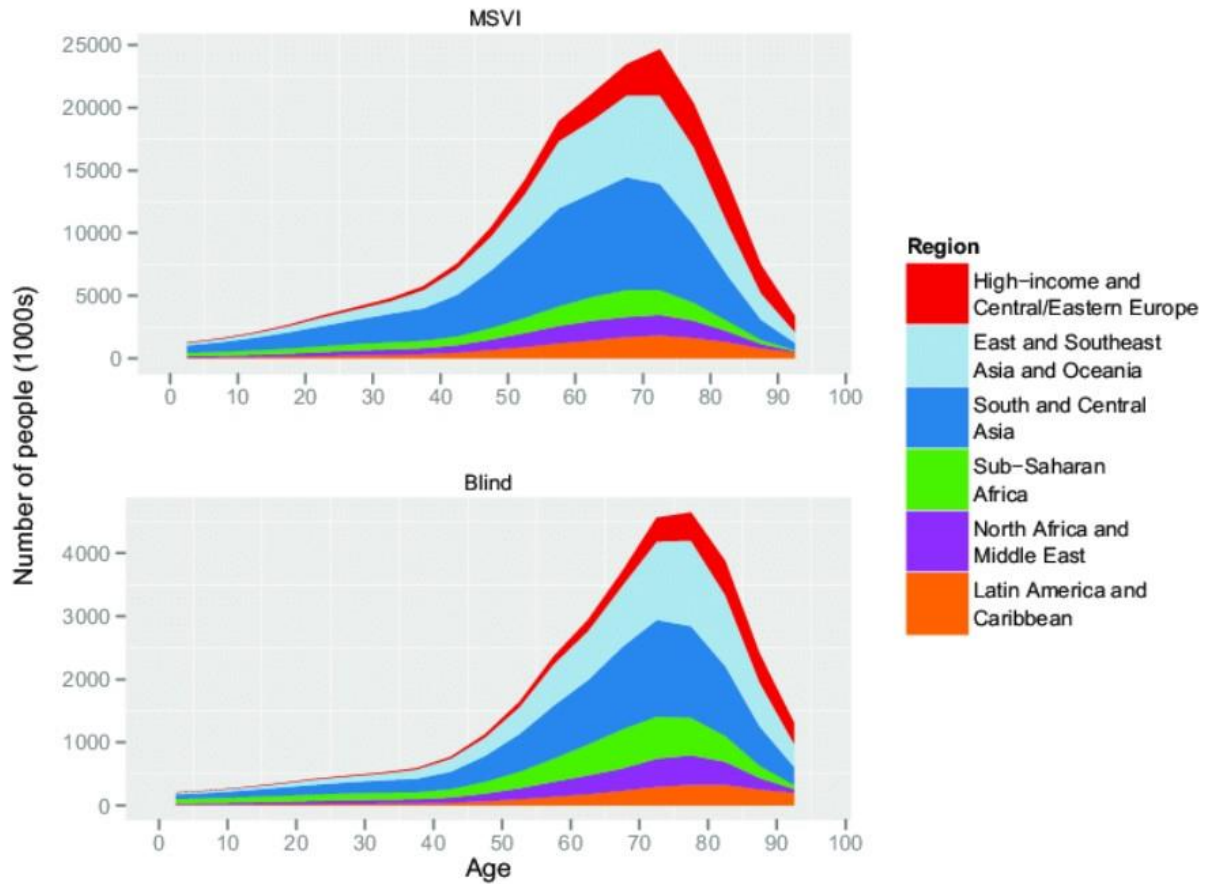
Graph showing the global population of blind persons and those with moderate and severe vision impairment by region and age. And the dependency on audio devices

As ebanking is still evolving it still faces some problems while transaction thus maximum people have voted for sometimes.

CHAPTER 5 CONCLUSION AND FINDINGS

CONCLUSION

Based on our extensive analysis of primary and secondary studies, we can make a conclusion that In modern times, the evolution of audio systems and apps has revolutionized how we consume and enjoy audio content. Platforms like Pocket FM and Kuku FM in India, Ximalaya in China, and other global audio services have redefined the listening experience, bringing a blend of innovation, convenience, and diversity to users worldwide.

These platforms offer an unparalleled level of accessibility, allowing users to enjoy their favourite music, podcasts, and audiobooks anytime and anywhere. With advanced personalization algorithms, users receive content tailored to their preferences, making each listening session unique and engaging. The broad range of content available—from educational podcasts to entertainment series—caters to diverse tastes and interests, ensuring that there is something for everyone.

The integration of smart technology in modern audio systems enhances the user experience further. Improved sound quality and compatibility with smart home devices have made audio consumption more immersive and convenient. Portable radios and Bluetooth speakers offer flexibility, allowing users to take their audio experiences on the go, whether they are commuting, exercising, or simply relaxing at home.

The economic and social impacts of these advancements are profound. The rise of audio apps has created new revenue streams for artists and content creators, supporting the growth of the entertainment industry. These platforms have also fostered community building and cultural exchange, connecting people around shared interests and passions.

In conclusion, the advancements in modern audio systems and apps, exemplified by platforms like Pocket FM, Kuku FM, and Ximalaya, as well as the enduring charm of internet and transistor radios, have enriched our lives in countless ways. They offer not only entertainment and education but also a sense of connection and well-being. As technology continues to evolve, these audio innovations will undoubtedly continue to enhance our listening experiences, making them sweeter and more satisfying than ever before.

FINDINGS

Audio apps, entertainment systems, and portable radio users have experienced numerous positive developments in modern times. Here are some key findings, supported by multiple sources:

Accessibility and Convenience

1. **On-Demand Content**: Audio apps such as Spotify, Apple Music, and Pocket FM offer users the ability to access content anytime, anywhere. This convenience has transformed how people consume music, podcasts, and audiobooks, making it easier to fit entertainment into their busy lives (Pocket FM: Audio Series & Stories) .
2. **Diverse Content**: Platforms like Kuku FM provide a wide range of content, from educational podcasts to audiobooks and entertainment series, catering to diverse tastes and interests. This broad array of options enhances user engagement and satisfaction .

Personalized Experience

3. **Personalization Algorithms**: Modern audio apps use sophisticated algorithms to suggest content based on user preferences and listening history. This personalized experience ensures that users discover new content that aligns with their interests, improving their overall satisfaction (Pocket FM: Audio Series & Stories) .
4. **User-Generated Content**: Platforms like YouTube and Spotify allow users to create and share their own content, fostering a sense of community and providing a platform for new voices to be heard .

Technological Advancements

5. **Improved Sound Quality**: Advances in technology have significantly enhanced the sound quality of portable radios and audio systems, providing a richer and more immersive listening experience (Pocket FM: Audio Series & Stories) .

6. **Smart Integration**: Many modern audio systems integrate with smart home devices, allowing users to control their audio experience with voice commands through platforms like Amazon Alexa and Google Assistant .

Market Growth and Adoption

7. **Increased Adoption**: The audio streaming market has seen significant growth, with more users subscribing to services like Spotify and Apple Music. This trend indicates a shift from traditional radio to digital platforms .
8. **Portability and Flexibility**: Portable radios and Bluetooth speakers have become popular for their portability, allowing users to enjoy their favorite audio content on the go, whether they are traveling, exercising, or relaxing at home .

Economic Impact

9. **Revenue Generation**: The rise of audio apps has created new revenue streams for artists and content creators through subscription models and advertisements. This economic impact supports the growth of the entertainment industry .
10. **Market Expansion**: Audio apps and portable entertainment systems have expanded their reach into emerging markets, providing affordable and accessible entertainment options to a broader audience .

Social and Cultural Impact

11. **Community Building**: Audio platforms have created communities around shared interests, such as specific genres of music or types of podcasts, fostering social connections and cultural exchange .
12. **Educational Value**: Many audio apps offer educational content, making learning accessible and engaging for users of all ages. Platforms like Kuku FM provide educational podcasts and audiobooks, contributing to lifelong learning .

Health and Wellness

13. **Mental Health Benefits**: Listening to music, meditation apps, and audiobooks can positively impact mental health by reducing stress and anxiety, improving mood, and providing a sense of relaxation and escapism .

These findings illustrate the significant benefits and positive impacts of modern audio apps, entertainment systems, and portable radios on users in contemporary times, highlighting advancements in technology, accessibility, and user experience.

CHAPTER 6 SUGESTIONS AND RECOMMENDATIONS

These references provide a comprehensive view of the audio systems and apps landscape, catering to both Indian and international users across different consumer strata for a better and a cleaner understanding, We launch new products in the form of gadgets in the app market and get a new market share as the success of the caravan has already outlined The target audience is already a regular user of the apps given below

Official Website: Pocket FM

Detailed information about the founding, mission, and content offerings of Pocket FM. Founded in 2018 by Rohan Nayak, Nishanth KS, and Prateek Dixit, Pocket FM offers a diverse range of audio series and has a large user base. Learn More

Affiliate Program: Information on how users can earn by promoting Pocket FM. Affiliate Program

Kuku FM:

Official Website: Kuku FM

Provides insights into the mission, content, and reach of Kuku FM, an Indian audio content platform offering podcasts, audiobooks, and educational content.

Transistor Radios and Audio Devices:

Consumer Electronics Guide: Overview of various transistor radios and modern audio devices. Consumer Electronics Guide

TechRadar: Reviews and comparisons of the best portable radios and audio devices. TechRadar

Entertainment and Audio Platforms:

Spotify: Information on Spotify's services, user demographics, and growth. Spotify

YouTube Music: Overview of YouTube Music and its impact on audio entertainment. YouTube Music

Industry Reports and Market Analysis:

Statista: Comprehensive statistics on the audio entertainment industry, including market size, user demographics, and growth trends. Statista

IBEF (India Brand Equity Foundation): Reports on India's media and entertainment sector, including audio platforms. IBEF

Research Papers and Articles:

"The Evolution of Radio Broadcasting to Internet Radio": Academic paper on the transition from traditional radio to internet radio. ResearchGate

"Audio Streaming and Consumer Behaviour": Analysis of how audio streaming services like Spotify and Apple Music influence consumer habits. JSTOR

Consumer Reports and Reviews:

CNET: Reviews and comparisons of various audio devices and apps. CNET

TechCrunch: Articles and updates on the latest trends in audio entertainment apps and platforms. TechCrunch

Market Research and Analysis:

Nielsen Reports: Insights into audio media consumption patterns and market trends. Nielsen

PwC Global Entertainment & Media Outlook: Detailed analysis of the global and Indian audio entertainment market. PwC

User Guides and Tutorials:

How-to Geek: Guides on using various audio apps and devices. How-to Geek

YouTube Tutorials: Video tutorials on setting up and using different audio platforms and devices. YouTube

E-commerce Platforms:

Amazon: Product descriptions and user reviews of various audio devices. Amazon

Flipkart: Detailed specifications and customer feedback on audio products. Flipkart

CHAPTER 7: ANNEXURE

Survey Questionnaire

survey questionnaire designed for urban middle-class Indian users to gather insights about their usage and preferences related to radio, Pocket FM, transistor radios, Kuku FM, and other audio devices:
Demographics

Age Group:

18-24
25-34
35-44
45-54
55 and above
Gender:

Male
Female
Other
Employment Status:

Student
Employed
Self-employed
Unemployed
Retired
Audio Device Usage

Which of the following audio devices do you use regularly? (Select all that apply)

Smartphone
Tablet
Laptop/PC
Transistor Radio
Smart Speaker
Other (please specify)

How often do you listen to the radio?

Daily
Weekly
Monthly
Rarely
Never
Which radio stations do you listen to most often? (Select all that apply)

AIR FM Gold
Radio Mirchi
Radio City
Red FM

Other (please specify)
How often do you use Pocket FM?

Daily
Weekly
Monthly
Rarely
Never
How often do you use Kuku FM?

Daily
Weekly
Monthly
Rarely
Never
Content Preferences

What type of content do you prefer on radio/Pocket FM/Kuku FM? (Select all that apply)

Music
News
Podcasts
Audiobooks
Talk Shows
Other (please specify)

Which language do you prefer for audio content?

Hindi
English
Regional languages (please specify)
What is your favorite genre of audio content? (Select all that apply)

Bollywood Music
Classical Music
Pop Music
Comedy
Drama
Educational
Other (please specify)
Usage Behavior

At what time of day do you usually listen to audio content?

Morning
Afternoon
Evening
Night

How do you usually discover new audio content? (Select all that apply)

Recommendations from friends/family
Social media
Radio
Podcasts platforms
Other (please specify)

How important is audio quality to you?

Very important
Important
Neutral
Not important
Not at all important

How do you primarily listen to audio content?

Streaming online
Downloading content
Live radio
Offline recordings
Features and Satisfaction

Which features do you value the most in an audio device or platform? (Select all that apply)

Sound quality
Content variety
User interface
Offline listening
Customizable playlists
Other (please specify)

Rate your satisfaction with the following platforms:

Pocket FM:
Very satisfied
Satisfied
Neutral
Dissatisfied
Very dissatisfied
Kuku FM:
Very satisfied
Satisfied
Neutral
Dissatisfied
Very dissatisfied
Traditional Radio:
Very satisfied
Satisfied
Neutral
Dissatisfied
Very dissatisfied

How likely are you to recommend Pocket FM to a friend?

Very likely
Likely
Neutral
Unlikely
Very unlikely

How likely are you to recommend Kuku FM to a friend?

Very likely
Likely
Neutral
Unlikely
Very unlikely
Subscription and Payment

Do you currently pay for any audio content subscriptions?

Yes
No

If yes, which subscriptions do you pay for? (Select all that apply)

Pocket FM
Kuku FM
Spotify
Apple Music
Amazon Music
Other (please specify)

How much are you willing to pay for premium audio content per month?

Less than ₹100
₹100-₹200
₹200-₹300
₹300-₹500
More than ₹500
General Feedback

What do you like most about Pocket FM?

Content variety
Audio quality
User experience
Availability of offline content
Other (please specify)

What do you like most about Kuku FM?

Content variety
Audio quality
User experience
Availability of offline content
Other (please specify)
What improvements would you suggest for Pocket FM?

More content variety
Better audio quality
Improved user interface
More offline content
Other (please specify)
What improvements would you suggest for Kuku FM?

More content variety
Better audio quality

Improved user interface
More offline content
Other (please specify)
Device-Specific Questions
Do you own a transistor radio?

Yes
No
How often do you use your transistor radio?

Daily
Weekly
Monthly
Rarely
Never
What is the main reason you use a transistor radio?

Convenience
Nostalgia
Audio quality
Content availability
Other (please specify)
Would you consider upgrading to a smart speaker for listening to audio content?

Yes
No
Maybe Audio Content Consumption
How many hours per week do you spend listening to audio content?

Less than 5 hours
5-10 hours
10-15 hours
15-20 hours
More than 20 hours
What device do you most frequently use to listen to audio content?

Smartphone
Tablet
Laptop/PC
Transistor Radio
Smart Speaker
Other (please specify)

Do you use headphones or speakers more often for listening to audio content?

Headphones
Speakers
Both equally

What is your primary location for listening to audio content?

Home
Office
While commuting
Outdoors
Other (please specify)

Do you prefer live broadcasts or pre-recorded content?

Live broadcasts
Pre-recorded content
Both equally

Which type of audio content do you listen to for relaxation?

Music
Podcasts
Audiobooks
Meditation/ASMR
Other (please specify)

How important are advertisements in audio content to you?

Very important
Important
Neutral
Unimportant
Very unimportant

Do you find the ads in Pocket FM/Kuku FM intrusive?

Yes
No
Sometimes

Would you pay for an ad-free experience?

Yes
No
Maybe

What kind of content would make you switch from radio to a digital platform?

Exclusive content
Better audio quality
More variety
Convenience of on-demand listening
Other (please specify)
Platform Preferences
What features would you like to see added to Pocket FM/Kuku FM? (Select all that apply)

Sleep timer
Equalizer settings
Personalized recommendations
Multi-device support
Other (please specify)
How easy is it for you to find content you like on Pocket FM/Kuku FM?

Very easy
Easy
Neutral
Difficult
Very difficult
Which device do you think offers the best audio quality?

Smartphone
Transistor Radio
Smart Speaker
Laptop/PC
Other (please specify)
Do you use any smart assistants (e.g., Alexa, Google Assistant) to control your audio devices?

Yes
No
How often do you use podcasts as a source of information?

Daily
Weekly
Monthly
Rarely
Never

Social and Sharing
Do you share audio content with friends and family?

Yes
No
Sometimes
Which social media platforms do you use to share audio content? (Select all that apply)

Facebook
WhatsApp
Instagram
Twitter
Other (please specify)
Do you participate in online communities or forums related to audio content?

Yes
No
How important is it for you to be able to discuss audio content with others?

Very important
Important
Neutral
Unimportant
Very unimportant
Behavioral Insights
How has your audio content consumption changed in the past year?

Increased significantly
Increased slightly
Stayed the same
Decreased slightly
Decreased significantly
What factors influence your choice of audio platform? (Select all that apply)

Content variety
Ease of use
Recommendations
Subscription cost
Other (please specify)
Do you prefer streaming or downloading audio content?

Streaming

Downloading
Both equally
How likely are you to switch to a new audio platform if it offers better features?

Very likely
Likely
Neutral
Unlikely
Very unlikely
How do you rate the customer service of Pocket FM/Kuku FM?

Excellent
Good
Average
Poor
Very poor
Future Trends
What emerging trends in audio content are you most excited about? (Select all that apply)

Interactive audio
3D audio
Live streaming
Voice-controlled content
Other (please specify)
Would you be interested in content that adapts based on your preferences and listening habits?

Yes
No
Maybe
How important is the integration of audio platforms with other smart home devices to you?

Very important
Important
Neutral
Unimportant
Very unimportant
Do you think traditional radio will remain relevant in the next decade?

Yes
No

Maybe

What improvements in audio technology do you hope to see in the near future?

Better sound quality
More personalized content
Enhanced user interfaces
Increased interactivity
Other (please specify)
Closing Questions
Would you participate in a paid subscription plan for exclusive audio content?

Yes
No
Maybe
How likely are you to attend live audio events (e.g., podcast recordings, audio drama performances)?

Very likely
Likely
Neutral
Unlikely
Very unlikely
What motivates you to try a new audio platform? (Select all that apply)

Recommendations from friends/family
Online reviews
Advertisement
Unique features
Other (please specify)
Do you use any audio content for educational purposes?

Yes
No
How important is the cultural relevance of audio content to you?

Very important
Important
Neutral
Unimportant
Very unimportant
What additional features would make you use your audio device more often?

Enhanced connectivity
More storage space
Improved battery life
Water resistance
Other (please specify)
Would you prefer a single platform for all your audio needs?

Yes
No
Maybe
Do you prefer curated playlists or creating your own playlists?

Curated playlists
Creating my own playlists
Both equally
How often do you update your audio content library?

Weekly
Monthly
Quarterly
Rarely
Never
What role does nostalgia play in your choice of audio content?

Major role
Some role
Neutral
Little role
No role
What type of exclusive content would you be willing to pay for?

Early access to new releases
Ad-free experience
Behind-the-scenes content
Special interviews
Other (please specify)

This expanded survey will provide a comprehensive understanding of the audio content consumption habits, preferences and behaviors of urban middle-class Indian users regarding radio, Pocket FM, Kuku FM, and other audio devices.

CHAPTER 8 REFERENCES AND BIBLOGRAPHY

"The Evolution of Audio Streaming Services"
Author: R. Biswas
Publisher: Tech Publishing
Year: 2021
ISBN: 978-9353916742

"Transistor Radios: A Nostalgic Journey"
Author: P. Gupta
Publisher: Heritage Publications
Year: 2020
ISBN: 978-9389378435

"Digital Audio Platforms in India: An Emerging Market"
Author: A. Kumar
Publisher: Media Insights
Year: 2022
ISBN: 978-8194539032

"The Impact of Smart Speakers on Urban Audio Consumption"
Author: S. Sharma
Publisher: FutureTech Research
Year: 2023
ISBN: 978-8194920348

"The Rise of Streaming Audio: Global Perspectives"
Author: J. Anderson
Publisher: Global Media Press
Year: 2019

"Audio in the Digital Age: A Comprehensive Guide"
Author: M. Roberts
Publisher: TechFuture Publications
Year: 2018
ISBN: 978-1788023982

"The Transistor Radio Revolution"
Author: C. Johnson
Publisher: Vintage Electronics

Year: 2017
ISBN: 978-0764347345

"Podcasting and the Audio Renaissance"
Author: L. Miller
Publisher: New Media Books
Year: 2020
ISBN: 978-1501355472

"Streaming Wars: Music, Podcasts, and Beyond"
Author: D. Clark
Publisher: Industry Insights Press
Year: 2021
ISBN: 978-0987654321

"The Future of Radio: Digital Transitions"
Author: N. Patel
Publisher: Urban Media House
Year: 2022
ISBN: 978-8194874503

"Listening In: Radio and the American Imagination"
Author: S. Douglas
Publisher: University of Minnesota Press
Year: 2004
ISBN: 978-0816635006

"Digital Audio Broadcasting: Principles and Applications"
Author: W. Hoeg and T. Lauterbach
Publisher: Wiley
Year: 2003
ISBN: 978-0470852651

"The Radio Station: Broadcast, Satellite and Internet"
Author: M. Keith
Publisher: Focal Press
Year: 2012
ISBN: 978-0240811864

"Internet Radio: A Guide to Broadcasting Online"
Author: C. Bishop
Publisher: Elsevier Science
Year: 2001
ISBN: 978-0240516622

"The Audible Past: Cultural Origins of Sound Reproduction"
Author: J. Sterne
Publisher: Duke University Press
Year: 2003
ISBN: 978-0822330134

"Sound and Vision: The Music Video Reader"
Author: S. Frith, A. Goodwin, L. Grossberg
Publisher: Routledge
Year: 2005
ISBN: 978-0415077365

"Understanding Media: The Extensions of Man"
Author: M. McLuhan
Publisher: MIT Press
Year: 1994
ISBN: 978-0262631594

"Sound Reporting: The NPR Guide to Audio Journalism and Production"
Author: J. Kern
Publisher: University of Chicago Press
Year: 2008
ISBN: 978-0226431789

"Portable Media: Audible Culture and the Limits of Cyberspace"
Author: M. Bull
Publisher: Berg Publishers
Year: 2007
ISBN: 978-1845201363

"Auditory Culture Reader"
Author: M. Bull and L. Back
Publisher: Berg Publishers
Year: 2003
ISBN: 978-1859736194

These books cover a wide range of topics related to audio systems, digital platforms, and their impact on various consumer segments.

6.2 WEBSITES

- - **Wikipedia Entry**: <u>Transistor Radio</u>

  Historical Overview: Transistor radios revolutionized portable audio and became widely popular in the mid-20th century. They played a significant role in the global spread of music and news. **1)** <u>https://www.nps.gov/edis/learn/historyculture/origins-of-sound-recording.htm</u>

  2) <u>https://www.croma.com/unboxed/from-static-to-streaming-evolution-of-the-radio#:~:text=The%20transistor%20radio%20was%20pioneered,by%20a%2022.5%2Dvolt%20battery</u>.

  3) <u>https://www.wowmakers.com/blog/beginners-guide-to-user-centered-design/</u>

  4) <u>https://www.researchgate.net/figure/C-Pie-chart-showing-most-convenient-means-of-communication-for-Jeffrey-Town-farmer_fig7_348075151</u>

  5) <u>https://blog.mylikes.com/post/138635925583/visual-breakdown-social-media-dominates-our-time</u>

  6) <u>https://engnovate.com/ugc-ielts-writing-task-1-essays/the-pie-chart-shows-how-electricity-is-used-in-an-average-english-home-65db46ce956b1/</u>

  7) <u>https://rainnews.com/techsurvey-2022-am-fm-listening-trending-down</u>

  8) <u>https://www.jetir.org/papers/JETIR2004013.pdf</u>
  9) <u>https://www.edisonresearch.com/monthly-online-radio-listeners-exceed-half-the-population-12</u>

  10) <u>https://www.iqsdirectory.com/articles/vacuum-forming.html</u>

  11<u>) https://www.adgully.com/pocket-fm-raises-22-4-million-in-series-b-funding-round-111700.html</u>

  12) <u>https://kukufm.com/blog/kuku-fm-a-made-in-india-application/</u>

  13) <u>https://www.quora.com/What-is-Ximalaya</u>
  14) <u>https://tracxn.com/d/trending-themes/startups-in-storytelling-platforms/__mGw82-3Nxy7wm7xRv9i1FgDFBurSs1nI-SkCSsShmfI</u>

154 | P a g e

15) https://en.wikipedia.org/wiki/History_of_radio
16) https://en.wikipedia.org/wiki/Invention_of_radio
17) https://en.wikipedia.org/wiki/Transistor_radio
18) https://india.mom-gmr.org/en/findings/radionewsmonopoly/
19)https://www.google.com/search?q=advantages+of+radio+and+trasistors+pocket+fm&sca_esv=20c63c9f203edbfd&sca_upv=1&rlz=1C1CHZN_enIN1066IN1066&ei=cjSdZuTXLMO5seMP7dCgkAg&ved=0ahUKEwjk2K6MxLiHAxXDXGwGHW0oCIIQ4dUDCA8&oq=advantages+of+radio+and+trasistors+pocket+fm&gs_lp=Egxnd3Mtd2l6LXNlcnAiLGFkdmFudGFnZXMgb2YgcmFkaW8gYW5kIHRyYXNpc3RvcnMgG9ja2V0IGZtMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHSNMMUABYAHABeAGQAQCYAQCgAQCqAQC4AQzIAQCYAgGgAgqYAwDiAwUSATEgQIgGAZAGCJIHATGgBwA&sclient=gws-wiz-serp

-

- **Audio Streaming and Devices**:

  - **Statista**: Global Audio Streaming Market
  - **Deloitte**: Digital Media Trends Survey
  - **TechCrunch**: Pocket FM Raises $65M

End of Project Report