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Integration of terrestrial radio and visual radio: A case study of m radio 98.8 Surabaya

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Abstract: In the process of developing transmission technology and internet applications, radio broadcasting institutions are constantly evolving. In an effort to improve management performance, any changes in radio broadcasting technology are always adaptable. This study utilises a qualitative approach that is still rarely used to review the integration of terrestrial and visual radio. Data collection techniques were used through field observations, interviews, and documentation studies. After data collection was completed, data analysis was conducted systematically in three aspects: data reduction, data display, and conclusion drawing. In contrast to the transmission of radio broadcasts over the air or voice broadcasts, this study found that radio broadcasts can also be distributed through audio and video streaming on the internet (also known as the network) in the form of voice, text, images, and video.
Keywords: *Diffusion of innovation, Internet, Radio broadcasting, Terrestrial, Visual radio.*

1. Introduction

Radio, as one of the oldest mass media, has undergone significant transformation over time. Like other media industries before it, radio broadcasting is increasingly facing competition from new media platforms and changing consumer expectations. Many radio broadcasters are experimenting with possible solutions and changing their production processes.(Hirschmeier et al., 2019) Originally, radio used analogue technology, where sound signals were converted into electromagnetic waves which were then transmitted through the air. This system has several limitations, such as less clear sound quality and susceptibility to interference. As technology developed, radio switched to digital systems. In recent years, technological advances have enabled the rapid development of radio frequencies, especially improving various hybrid architectures and digital signal processing circuits.(Li et al., 2022) Digital broadcasting offers a number of advantages over analogue broadcasting, including better sound quality, greater data capacity, spectrum efficiency and interactivity. In addition to the shift to digital, the trend of media integration has also characterised the development of modern radio. Media integration refers to the merging of various media platforms to provide a richer experience to listeners. The presence of developmental sciences and new technologies that exist in Indonesia and began to be used by public, private, and community broadcasting stations to disseminate broadcasts via the internet, namely streaming. (Gogali & Tsabit, 2020) Some relevant media integration trends for radio are online radio, social media, video, and podcasts.(Sompie et al., 2024) Media integration allows radio to reach a wider audience; by being present on various digital platforms, radio can reach a more diverse range of listeners. (Astuti & Harliantara, 2021) The recent digital transformation initiative has facilitated access to platform-based business models on the demand side and enabled the necessary closeness with potential customers on the supply side. (Daniel Rohn et al., 2021) In addition, increasing interaction with listeners through social media and other digital platforms can enhance listener engagement. Also, integration with digital platforms opens up opportunities to generate new revenue through digital advertising and subscription services, and media integration helps radio remain relevant in the ever-evolving digital era. The development of radio technology from analog to digital, as well as the trend of media integration, has changed the way we listen to the radio. Radio is no longer just an audio medium;

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it has become an interactive multimedia platform that can be accessed anytime and anywhere. (MAYDA, 2022) With that background, the adoption of technology is essential to keep up with the times, where the diffusion of innovation becomes important. Therefore, the main objective of this research is to analyze the diffusion process of innovation in the integration of terrestrial radio and visual radio, with the research location at M Radio 98.8 Surabaya, which has implemented and adapted to contemporary broadcasting technology. The problem formulation is how M Radio 98.8 Surabaya adopts the innovation of integrating terrestrial radio and visual radio?

2. Literature Review

Previous studies related to the diffusion of innovation are very diverse, covering various sectors and contexts. Some examples of studies relevant to the research topic of the diffusion of innovation in the integration of terrestrial radio and visual radio include the adoption of new technologies in the media industry, such as the reception of digital television, internet radio, and streaming platforms. (Felix, 2024) These studies often analyse the factors that influence the speed and level of new technology adoption by media companies and consumers. In the context of digital radio adoption research, which is a study on digital radio adoption, it can provide insights into how listeners receive the new broadcast format, better sound quality, and additional features offered by radio broadcasting in visual radio broadcasts.

In this research, the literature used is Everett Rogers' diffusion of innovations theory. This theory helps us understand how social practices, ideas, or new products spread within society. Rogers defines diffusion as the process by which innovations, whether products or new practices, are communicated through various channels in a social system. Adopters consider the new innovation, even though it already exists elsewhere. (Mulyati et al., 2023) This theory is also very relevant for understanding how innovations such as terrestrial radio integration and visual radio are adopted by radio broadcasters.

The main concept in the theory of diffusion of innovation is an idea, object, or practice that is considered new by individuals, groups, or organizations. According to Rogers, diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication related to the dissemination of messages perceived as new ideals. Communication is a process in which participants create and share information with each other sequentially to achieve mutual understanding. Diffusion has a special character because of the new ideas in the content of the message. (Mihardja, 2022) Everett Rogers identified several characteristics of innovation that influence the rate of adoption, namely relative advantage, compatibility, complexity, trialability, and observability. (Sudrajat & Rosyad, 2018) Then adoption is the process where individuals decide to use the innovation regularly. The stages are knowledge, persuasion, decision, implementation, and confirmation. (Damanpour & Schneider, 2006) Another concept is the communication channel, which is a means used to disseminate information about innovations and types of communication channels such as mass media (radio), interpersonal, and digital. The application of innovation diffusion theory in the context of terrestrial radio and visual radio integration. In the context of terrestrial radio and visual radio integration at M Radio 98.8 Surabaya, innovation diffusion theory can be used to analyse the innovation adoption process, communication channels in innovation adoption, and success factors in the implementation of innovation adoption.

Everett Rogers' diffusion of innovations theory provides a useful framework for understanding how new innovations, such as terrestrial radio integration and visual radio, are accepted and adopted by society. (ismandianto et al.,2022) By understanding concepts such as innovation, adoption, and communication channels, we can analyse the factors that influence the success or failure of an innovation. Media integration is a phenomenon where various media platforms, such as radio and the internet, connect and collaborate to deliver messages more effectively and comprehensively. (Harliantara, et al.) This phenomenon is driven by the development of digital technology that enables more seamless interconnection between various media. (Studi et al., 2016) Media integration has become an inevitable trend in the modern media landscape. By leveraging digital technology, various media platforms can complement each other and provide a richer experience for users. Although there are

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challenges that need to be addressed, the benefits of media integration are substantial and will continue to drive innovation in the future.

3. Research Method

This research uses a qualitative research approach with the aim of gaining a better understanding of what the research subjects experience and what it means. The case study approach is often used in social research to understand events, programs, individuals, groups, or organizations in a more in-depth and exploratory manner, striving to comprehend social phenomena from a research perspective. In this case, a case study is used to understand organizational events in their natural context. To enhance the validity of the findings, the sampling strategy used purposive sampling, specifically selecting key informants from the management of M Radio 98.8 Surabaya, and data analysis employed triangulation techniques of interviews, observations, and documents.

4. Results and Discussion

4.1. Overview of M Radio 98.8 Surabaya

M Radio 98.8 is one of the popular radio stations located at Laves Mall, G Floor No. 20, Jl. KH. Abdul Wahab Siamin Kav 9-10 Surabaya, Indonesia. Started broadcasting since 2007. M Radio continues to innovate and develop to remain relevant with the times and the tastes of its listeners. M Radio is not only a media for entertainment but also often involved in various social and community activities. The target audience is men and women aged 20 to 50 years. M Radio successfully captivates its listeners to faithfully accompany their days with a fresh music format and engaging programs. The hallmark of M Radio is its format, which includes music and information, with the music format featuring both Indonesian and international songs. In addition, the highlighted programs are Morning Drive from 06:00-10:00, MakSi Break (Lunch Break) from 11:00-13:00, Power Saga from 13:00-15:00, Happy Sore from 17:00-19:00, and Power Request from 19:00-21:00. M Radio 98.8 FM Surabaya has successfully positioned itself as one of the favourite radios in Surabaya. With an engaging music format, energetic hosts, and varied programs, M Radio is able to provide a delightful music listening experience for its audience. (Interview results with Deni Saha, Program & Music Director of M Radio)

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Figure 1.
Studio M radio Surabaya.
Source: Documentation of M radio Surabaya.

4.2. The Process of Innovation Adoption

One of the leading radio stations in Surabaya, M Radio Surabaya, has taken a step forward by integrating terrestrial and visual radio. This step is an interesting innovation to study because visual radio has a lot of potential to enrich the radio listening experience. (Harliantara, 2024) M Radio Surabaya is motivated to implement this innovation due to the increasing competition in the media world. In the development of the broadcasting industry, which is transitioning to the digital era, radio stations must continue to innovate to remain relevant and attract listeners. (Ismed, 2020) One way to differentiate oneself from competitors is by incorporating visual radio integration. Additionally, listeners are becoming increasingly accustomed to visual and interactive content as technology advances. Visual radio integration can meet listeners' desire for a more enjoyable listening experience. (Harliantara, et al.,2024)) From the interview with the leader of M Radio, it was also mentioned that technological advancements have made the integration of terrestrial radio and visual media easier and cheaper. The improving internet infrastructure, mobile applications, and streaming platforms support this development. With the integration of visual radio, there are new opportunities to make money, such as through more engaging advertisements or collaborations with advertisers.

The process of adopting this innovation involves several stages, starting from needs identification, solution search, planning and development, implementation, to evaluation.

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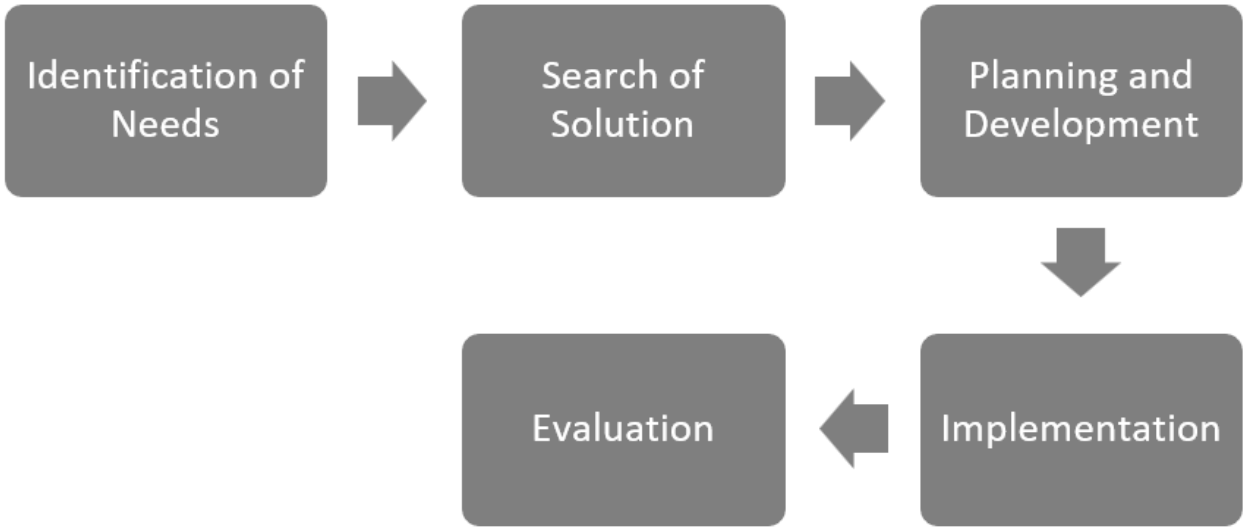

Figure 2.
Stages of the innovation adoption process.
Source: Results of the interview with the director of M radio.

In terms of the concept of media management according to (Wirtz, 2011) media includes all means or technical instruments aimed at the purpose of providing information in printed, visual, or auditory forms, as well as the organizational entities and institutions behind them that produce and supply this information. The information was directed in a traditional manner. However, according to Ir. Wahyu Widodo, Director of M Radio, the process of adopting innovation begins with identifying the need to increase listener engagement and expand audience reach. Next, the management team of M Radio found a way to meet that need. One promising option is the integration of visual and terrestrial radio. After that, the adoption of innovation requires team planning, which includes technology choices, visual design, and content strategy. Implementation is the next step, which includes launching visual radio broadcasts and interacting with listeners. After some time, M radio conducted an assessment to determine whether the innovation was successful in increasing the number of listeners, engagement, and advertising revenue. M Radio Surabaya shows that although the adoption of technological innovations has many positive potentials, there are also several issues that must be considered in its management.

In addition to many positive potentials, adopting technological innovations also has several challenges. Rimba Anditya K. S.T, Developer of the M Radio Application, said:

"That visual radio technology requires a lot of money for hardware, software, and human resources. Furthermore, uneven internet connectivity across the region can hinder visual radio broadcasts. In addition, some radio station employees do not have the necessary skills to manage visual platforms. As a result, significant changes in organizational culture are needed to embrace new innovations."

In line with the above statement, there is an interesting opinion from (Tryon, 2016) that a company's ability to identify and leverage technological opportunities is one of the most fundamental features that distinguishes successful companies from unsuccessful ones. But technology alone will not bring success. The company must be able to transform intellect, knowledge, and technology into things desired by customers. The ability to use its assets to engage in value-creating activities can lead to the development of company-specific competencies.

Further explained by Rimba Anditya K. S.T: *"That the impact of terrestrial and visual integration innovation at M Radio Surabaya has the potential to bring significant changes to listener behavior."*

The impact is a more active interaction where listeners can provide comments, reactions, and questions directly through the visual radio platform, creating a more intense interaction between listeners and broadcasters, as well as among listeners themselves. Additionally, visual radio allows for the organization of more interactive events, such as quizzes, polls, or live chats, which encourage

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listeners to participate actively. The most important thing will be to generate higher listener loyalty through more personal interactions; listeners tend to feel more connected to the radio station and have higher loyalty. (Amabile, 1988)

As for matters related to content, Robertus Albert, a production technician at M Radio, stated in an interview:

"That changes in content preferences, listeners will tend to prefer visual content, such as music videos, animations, or infographics, in addition to audio. Additionally, listeners will expect more interactive content, such as quizzes, games, or content that can be accessed through multi-platforms, and listeners will seek content that is relevant to their personal interests and preferences, which can be personalized through visual radio platforms."

Accompanied by the opinion of Ni Komang Ayu P.S, M Radio broadcaster:

"That the impact of terrestrial and visual integration can attract new listeners, especially the younger generation who are more familiar with technology. Additionally, listeners will spend more time-consuming radio content through visual radio platforms compared to conventional radio. Furthermore, advertisements on visual radio platforms can be more engaging and effective, potentially increasing revenue from the advertising sector."

In addition, several other factors that can influence the impact of visual radio integration on listener behavior include content quality, ease of access, effective promotion, and listener demographic characteristics. Visual radio integration has great potential to change the way listeners enjoy radio. Through an experimental approach, customers enjoy the content produced by the company that is deemed relevant at a certain stage of the journey, which will increase customer engagement with the selling company and its produced content. (Salonen et al., 2024)

However, the success of this innovation highly depends on the quality of the content, ease of access, and appropriate promotional strategies. By conducting more in-depth research, we can better understand the impact of this innovation and provide recommendations for further development.

Furthermore, Mr Wahyu Widodo, Director of M Radio Surabaya stated that:

" Technological innovation, especially the integration of terrestrial radio and visual radio, has brought fresh air to the broadcasting industry, including M Radio Surabaya. Some of the potential impacts that can occur on the performance of the radio station are increased ratings, increased advertising revenue and diversification of advertising revenue."

Table 1.
Performance improvement.

Radio visual performance improvement		
Improved ranking	Greater access	M Radio Surabaya can reach a wider audience with visual content, especially the younger generation who are more familiar with visual media.
	More engaging content	By combining audio and visuals, radio content can become more engaging and entertaining, increasing listenership.
	Better interaction	Listeners become more loyal to the radio station because of its interactive features that encourage interaction and engagement.
Increased revenue from advertising	More diverse adverts	Adverts in more engaging and interactive formats, such as clickable adverts or videos, can be shown on Visual Radio.
	Purposeful audience more specialised	M Radio Surabaya can target adverts more effectively with more complete data on listener preferences
	More expensive adverts	When compared to audio-only adverts, visual adverts are usually more expensive. This means that the adverts can bring in more money.
		To sell goods or services through visual radio

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Revenue diversification	E-Commerce	broadcasts, M Radio Surabaya can integrate an e-commerce platform.
	Events and sponsorships	conduct periodic evaluations to evaluate performance and improve it.

Source: Interview with M radio director.

The integration of terrestrial radio and visual radio has great potential to improve the performance of M Radio Surabaya. However, the Director of M Radio also mentioned that the successful implementation of this innovation is highly dependent on various factors, ranging from the right investment, content quality, to effective marketing strategies. With careful planning and consistent implementation, M Radio Surabaya can become a leader in the broadcasting industry in the digital era.

4.3. Communication Channels in M Radio Surabaya's Innovation Diffusion

M Radio Surabaya pays attention to the various communication channels available and the factors affecting them when diffusing the innovation of terrestrial and visual radio integration. M Radio can achieve its goal of increasing listenership and strengthening its position in the radio market with the right communication strategy.

M Radio itself was the most effective mass medium in driving this innovation. M Radio directly informed listeners about the format changes and new features through radio broadcasts, adverts, and promotions on social media. M Radio's digital platform is also a formal channel for conveying information to users. M Radio uses press releases to provide information to other mass media and the general public. The Semantic Web promises to provide mechanisms that enable interaction requirements.(Schraefel et al., 2005)

Listeners can interact with these innovations through social media, online discussion groups, or M Radio events. This creates a powerful informal channel for sharing information and opinions. Listeners who have strong influence in the community can act as influencers in spreading information about M Radio. Recommendations from friends, family or colleagues who have tried M Radio innovations are also very important to drive adoption. Conceptually, it is also explained by Wessels that Digital media is any media encoded in a machine-readable format. Digital media can be created, viewed, distributed, modified and preserved on digital electronic devices. Computer programmes and software; digital images, digital video; video games; web pages and websites, including social media; data and databases; digital audio, such as mp3; and electronic books are examples of digital media. (Wessels, 2019)

M Radio may conduct interactive programmes such as quizzes, competitions, or discussions that engage listeners directly. Social media platforms such as Instagram, Twitter and Facebook allow M Radio to interact with listeners directly and get immediate feedback. Pusers on social media are in dynamic causality with their choice of messages and networks. (Cho et al., 2022)

The effectiveness of communication channels in disseminating M Radio innovations is influenced by several factors, including that information coming from credible sources such as M Radio itself tends to be trusted more by listeners; ease of use, clear benefits, and compatibility with listeners' lifestyles will affect the speed of adoption. Broadcast value chains rely on content delivery networks (CDNs) to reach audiences. (Sjøvaag et al., 2024)

M Radio designs more effective communication strategies and uses all available communication channels. Creating a strong bond with listeners through direct and frequent interaction will increase trust and loyalty. Information about innovations can spread faster if you work with relevant influencers. M Radio should conduct regular evaluations to find out how well each communication channel is doing and make adjustments if necessary. (Albahri et al., 2023)

4.4. Key Factors Influencing the Success of M Radio Surabaya

The successful integration of terrestrial radio and visual radio at M Radio Surabaya begins with identifying and overcoming the challenges that may arise, as well as utilising the opportunities that exist, M Radio Surabaya can achieve success in its digital transformation efforts. This is also explained

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by Boucas & Perez that the theme of "Industry 4.0" as a vehicle for the "Circular Economy" is innovative. (Bouças Teixeira & Perez Teixeira, 2022)

M Radio Surabaya's management demonstrated a strong commitment to the adoption of this innovation, both in terms of resources, time, and moral support. Management has a clear vision of the purpose of this innovation and how it contributes to the long-term success of the radio station. Management maintains effective communication with all employees about the importance of innovation that will impact their work.

According to Deni Saha, Programme & Music Director of M Radio, integration is an important strategy in maintaining and sustaining competitiveness amidst the development of information technology and media. A response to the development of information technology, and it is possible to reach listeners further than terrestrial radio. Integrating audio and visual elements for all programmed elements. This innovation enriches the radio listening experience with visuals, and optimizes the interaction between announcers and listeners through platform features such as interactive/chat rooms, marketplace, and music videos. Adopted by more than 40,000 users proves that the concept of visual radio has been accepted and has great potential to grow and attract new users.

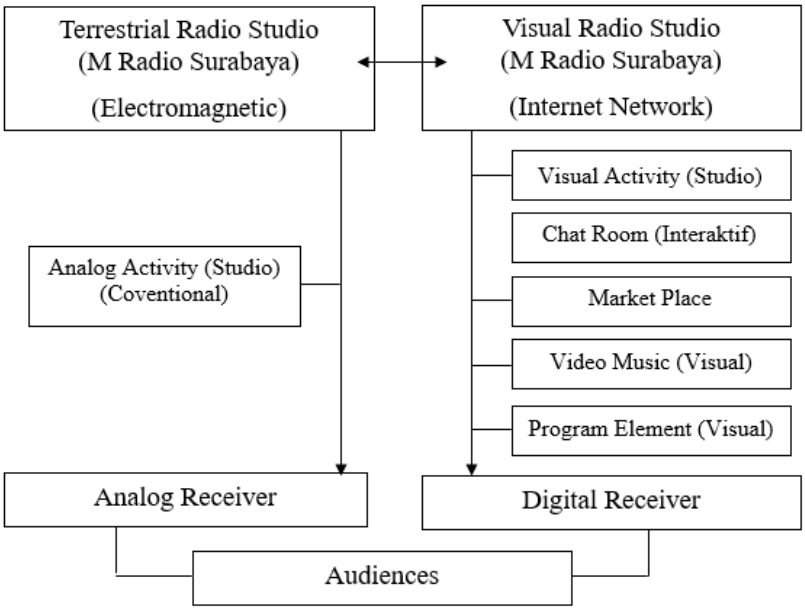

Figure 3.
Integration of terrestrial radio and visual radio.
Source: Interview results with Deni Saha, program & music director of m radio Surabaya.

Integration is an important strategy in maintaining and sustaining competitiveness amidst the development of information technology and media. It is a response to the development of information technology, and it is possible to reach listeners further than terrestrial radio. Integrating audio and visual elements for all programmed elements. This innovation enriches the radio listening experience with visuals, and optimizes the interaction between the announcer and the listener. through features on the platform such as interactive/chat rooms, marketplaces, and music videos. Adopted by more than 40 thousand users proves that this visual radio concept has been accepted and has great potential to grow and attract new users. Regarding employee engagement, it was found that M Radio Surabaya involves employees in the process of planning, implementing and evaluating innovations. It also conducts comprehensive training to ensure employees have the necessary skills to operate the new technology as well as rewarding employees who actively contribute to the success of the innovation. The content production presented by M Radio Surabaya is relevant to listeners' interests and preferences. Through constantly updated and innovative content attracts listeners' attention with good audio and visual

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quality and provides a pleasant listening experience. M Radio Surabaya also through supporting technology infrastructure, such as servers, networks, and software, is very reliable and efficient with the technology used is easy to use by employees and listeners.(Ganley & Lampe, 2009).

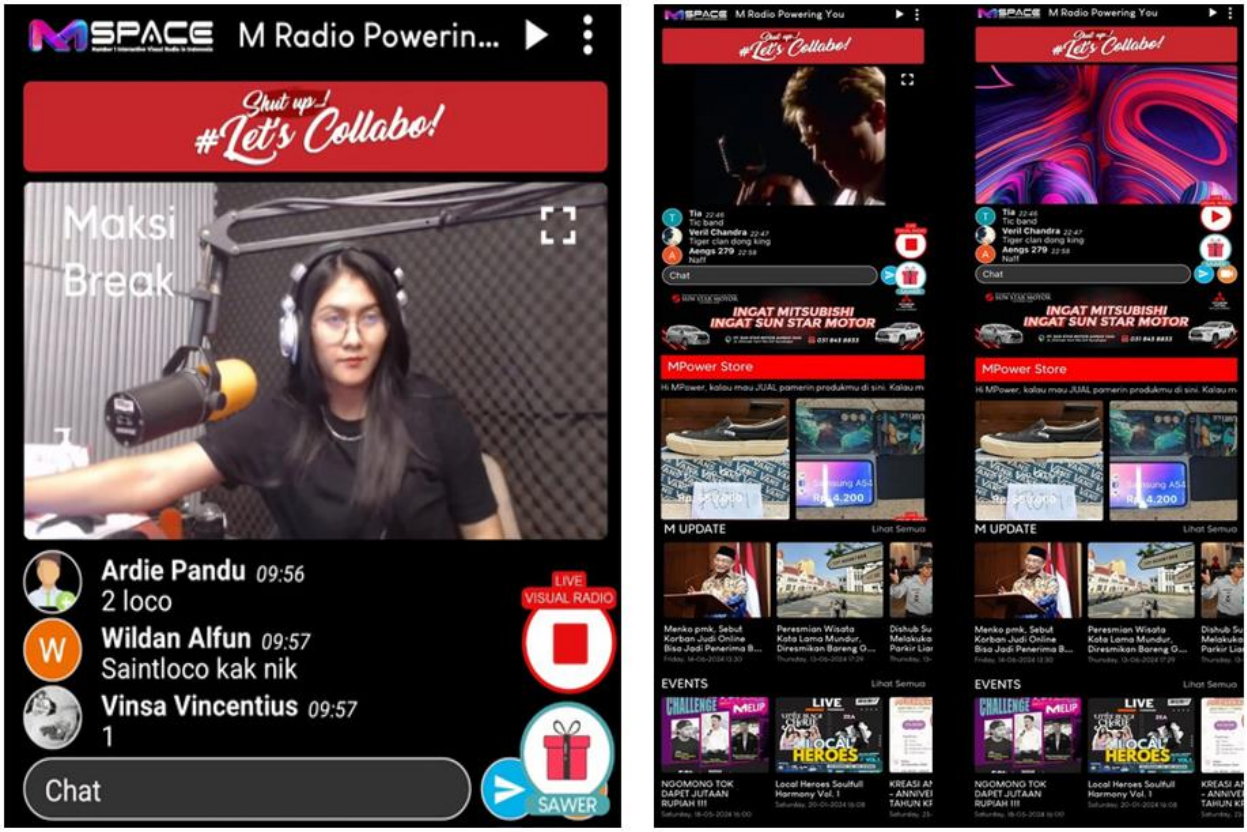

Figure 4.
M radio Surabaya visual radio application.
Source: M radio Surabaya documentation

In addition, M Radio Surabaya conducts promotions through various channels, both online and offline, to reach a wide audience with clear and easy-to-understand promotional messages, and emphasises the benefits that listeners will get from its technological innovations. And M Radio Surabaya continuously conducts regular monitoring of innovation performance, including the number of listeners, engagement rate, and advertising revenue. Conduct objective evaluations to identify areas for improvement and make adjustments to the strategy based on the evaluation results. The success of M Radio Surabaya's terrestrial radio and visual radio integration innovation is highly dependent on a combination of the above factors. By identifying and overcoming challenges that may arise, as well as capitalising on opportunities, M Radio Surabaya can achieve success in its digital transformation efforts.

5. Conclusion

The integration of terrestrial radio and visual radio conducted by M Radio 98.8 FM Surabaya is an adaptive effort to the changing media landscape that is increasingly digitalised. By presenting radio content visually through digital platforms, M Radio can reach younger listeners who are familiar with technology. Visual elements such as videos, images and text that accompany radio broadcasts can make the content more interesting and interactive, thereby increasing listener engagement. This integration helps M Radio reinforce its image as an innovative and relevant radio station. The digital platform allows M Radio to run more varied advertising formats, such as video ads, banners, and sponsorships.

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The integration of terrestrial radio and visual radio is a strategic move that radio stations can make to survive and thrive in the digital era. However, the success of this integration is highly dependent on the quality of content, understanding of audience behaviour, and the ability to effectively leverage technology. Radio station M Radio Surabaya continues to adapt to changes in technology and consumer behaviour to stay relevant. While visualisation can enhance appeal, good quality audio content remains the foundation of a radio station's success. Digital platforms offer various opportunities to engage with listeners and generate revenue.

More and more radio stations are undertaking similar integrations, so the competition to attract listeners' attention will intensify. Listener preferences for audio-visual content are constantly evolving, so radio stations need to keep innovating. Data obtained from digital platforms can be used to analyse listener preferences and deliver more personalised content.

Copyright:

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