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Digital Asset Management Transformation: Implementing RadioBOSS Automation and ElevenLabs AI at Radio Istara Surabaya

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Abstract. Traditional FM towers are no longer monuments of stability but have become relics. In a world dominated by on-demand streams, Radio Istara Surabaya (101.1 FM) chose a radical "survival pivot" over a slow death. This study dissects how they dismantled legacy workflows by grafting RadioBOSS automation onto ElevenLabs' synthetic voice engine. We are not just looking at software; we are looking at a 100% leap in production efficiency through a 60/30 model where AI handles the "grunt work" and humans act as curators. This is a survival map for the "post-radio" era.

Keywords. AI Automation, RadioBOSS, ElevenLabs, Digital Asset Management, Radio Convergence.

1. INTRODUCTION

1.1 The Shifting Ground of Modern Radio

The era of one-way terrestrial signals has effectively ended. It has been replaced by a messy, platform-based infrastructure where Internet penetration dictates the rules. Radio is no longer a standalone tower; it is an interactive node in a digital web where podcasts and streams set the pace [27], [8].

Fixed schedules? Those are gone too. Podcasting has killed the clock, making niche content the new baseline for attention. This is not just a platform change; it is a power shift between the microphone and the listener [10]. Modern broadcasting survives by plugging into global, web-based delivery systems to remain visible [8].

However, the hard truth is that broadcasters no longer own their distribution. The tech giants own the pipes. This takeover has rewritten the money rules for every station in the market [3]. For regional radio, buying a few upgrades will not save them. Listeners want audio *now*, and they will not wait for a signal. If a local station does not ditch the one-way model, it will be finished [16].

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The Tech Headache

Keeping streams stable in Indonesia is a high-stakes gamble. It is about the massive overhead of servers and CDNs needed to stop lagging when the traffic spikes [1]. Local providers are caught in a trap: match the quality of global giants or lose their audience. Surges in listeners require more than just a basic server; they require adaptive tools to manage the load across thousands of devices [17], [30].

The Istara Survival Play

Radio Istara Surabaya (101.1 FM) is a practical test case for this move. In a high-mobility city such as Surabaya, relying on FM towers is a dead end. Station Manager Rudi Didi saw this early. He didn't just order a software update; he called for an "evolving civilization of radio." To make this work, Istara plugged RadioBOSS directly into ElevenLabs. It is a technical hybrid designed to keep the "Istara sound" alive even when the studio is empty [1].

2. LITERATURE REVIEW

2.1 Digital Asset Management (DAM): The Engine Room

Radio stations cannot survive as digital hoarders. The DAM has evolved into the station's actual engine room, far beyond just a storage bin for audio files [14]. We are talking about a strategic backbone that forces real-time data, automation, and content optimization to work together in a single workflow.

Messy assets are equal to lost edges [11]. In the current market, metadata is the only thing that keeps files from disappearing when they are most needed [9]. For Istara, this is not optional. Sloppy metadata turns a digital library into a graveyard where assets are impossible to find [12]. High-quality tagging is what allows a station to "upcycle" a single clip into a podcast or social media highlight without breaking a sweat.

2.2 Automation: Beyond the Jukebox

The DJ as a glorified jukebox is a dead concept now. Modern systems such as RadioBOSS do more than just "play files"; they track a city's pulse [5]. This is strategic dayparting, hitting commuters with high-tempo tracks during the 8 AM rush and cooling down with softer tones for the late-night crowd. It is a psychological bridge that syncs broadcasts to the listener's daily life [22], [25]. This automation ensures that the station's brand voice remains consistent 24/7, even with zero human intervention at the faders [26].

2.3 The Rise of Synthetic Voices (AIGC)

The era of the clunky "robot voice" we used to mock is officially over. Platforms such as ElevenLabs are no longer just tools; they create synthetic humans [6]. These voices carry the very things that once made us unique: our breath, hesitation, and emotional weight. From a business standpoint, this represents a total collapse of production costs. Stations can now flood the airwaves with fresh content while their spending flatlines. We have reached a "post-human"

stage in broadcasting where the ear cannot tell the difference between a pulse and a processor [21].

2.4 Convergence: The Phone in the Pocket

Media are not just colliding; they are merging into a single digital soup [13]. For a regional player like Istara, the FM tower is no longer the center of its universe. Survival today requires aggressive "platformization" turning a traditional radio signal into a mobile app that lives in the listener's pocket [18]. This demands a management style that respects the old roots but hunts for data in the digital marketplace, like a technology startup [19].

2.5 The Ethical Boundary of AIGC in Broadcasting

As synthetic voices become indistinguishable from human voices, a new ethical frontier emerges. The use of AI-Generated Content (AIGC) in radio is not just a technical choice; it is a trust-based agreement with the listener [23]. Scholars argue that transparency is key, and broadcasters must decide whether to disclose the use of synthetic voices or let them blend seamlessly into the program. At Istara, the approach is pragmatic: AI is a tool for efficiency and not a replacement for accountability. The goal is to maintain a "human-in-the-loop" system to ensure that the content remains ethically grounded and culturally sensitive.

3. WRESTLING WITH THE METHODOLOGY

You cannot fit a "civilizational shift" into a multiple-choice survey. To understand how Istara Surabaya survived the digital meat grinder, we ditched a sterile, survey-heavy approach. Instead, we used a qualitative case study that was messy and deeply rooted in the "Surabaya context" [7]. Following Robert K. Yin's playbook, we did not just watch from the sidelines; we embedded ourselves in the newsroom [31]. We were looking for the "friction" in those moments when a human announcer's gut feeling clashed with an AI's cold code.

3.1. The Fieldwork: Three-Way Pincer Movement

We ignored the glossy PR stories. To get to the truth, we used a data-gathering pincer movement.

The Managerial Gut-Check.

We grilled the management for hours, digging into the strategic gambles and the technical failures that happened before they hit "success." We wanted to see the scars, not just blueprints.

The " Fly on-the-Wall

We spent weeks watching staff hands as they bounced between the ElevenLabs prompts and the RadioBOSS dashboard. We looked for unscripted fixes the human "hacks"–when the tech glitches two minutes before a live broadcast.

Digital Forensic Auditing.

We audited the metadata logs and crawled through Google Play Analytics. We had to prove that the "real-time sync" was a functioning reality on the listener's mobile phone.

4. FINDINGS AND DISCUSSION

During our weeks at Istara, it became obvious that RadioBOSS is not just software; it is the station's central nervous system. They do not just "automate" a playlist; they map the city's biorhythms [5]. When Surabaya's traffic hits a fever pitch at Wonokromo or Jalan Ahmad Yani, the system deploys high-adrenaline, fast-tempo audio to match the intensity of the commute. By midnight, it downshifts to an intimate state. This is not just scheduling; it is sonic architecture that keeps the "Istara sound" consistent without a human ever touching a fader [26]. The physical manifestation of this digital integration within the Istara studio environment is illustrated in Figure 1.

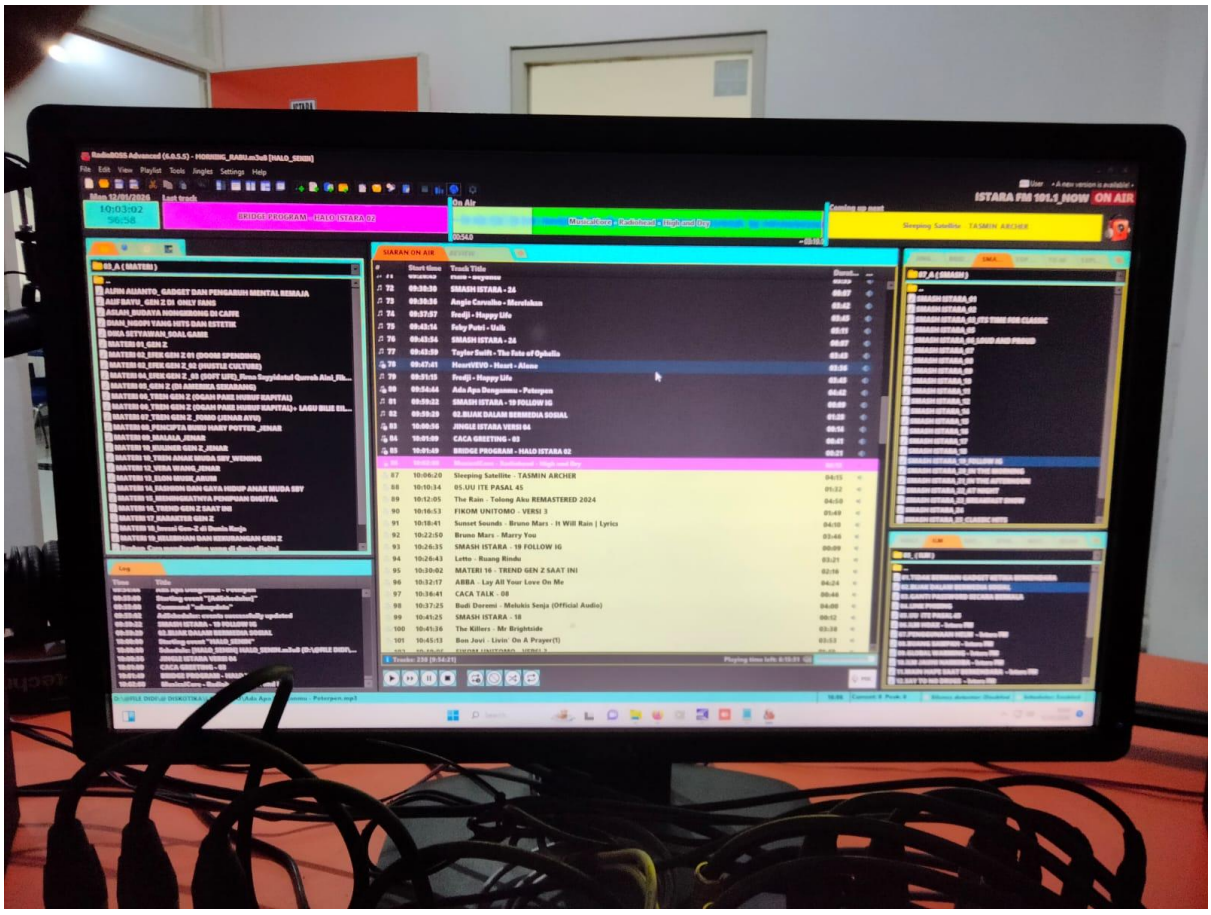

Figure 1. The operational environment at Radio Istara Surabaya depicts the integration of traditional broadcasting equipment with AI-driven automation software (RadioBOSS) and synthetic voice engines.

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4.1. The 60/30 Split: Killing the Labor Trap

The most explosive finding in this study was the success of the 60/30 model: 60% AI-generated voices and 30% human delivery. By grafting ElevenLabs into their production loop, Istara effectively killed the "production bottleneck" that drains most regional budgets. In the past, a simple 30-second announcement was a slow, expensive headache. Now, it is a near-instant digital process. Istara has successfully crossed the "Uncanny Valley "the point where synthetic voices stop sounding like robots and start sounding human [6].

To synthesize the empirical data gathered during our observation at Radio Istara, Table 1 provides a comparative breakdown of legacy manual workflows and the current AI-hybrid ecosystem. This comparison illustrates how the integration of RadioBOSS and ElevenLabs has moved the station beyond mere incremental improvements to a state of total operational transformation.

Table 1. Comparative Analysis of Production Efficiency: Manual Workflow vs. AI Hybrid Workflow

Operational Category	Traditional Workflow (Manual)	Istara Hybrid Workflow (60/30 Model)	Efficiency Impact
PSA/Jingle Production	2-4 Hours (Manual script, recording, editing)	< 15 Minutes (AI Prompting & Sync)	~90% Time Savings
Talent Expenditures	Per-Session/Project Based (High Variable Cost)	API Subscription (Flat/Low Fixed Cost)	Cost-Flatlining
Graveyard Shift	Live Announcers (High Burnout Risk)	ElevenLabs Synthetic Voice	100% Reliability
Output Capacity	Limited by Human Stamina	Unlimited (High-Volume Generation)	Maximum Scalability

As illustrated in Table 1, the most notable efficiency gains were observed in the production of ads and jingles. Tasks that once demanded a considerable amount of time from producers can now be accomplished in minutes. This change enables creative staff to concentrate on more valuable narrative projects rather than repetitive technical tasks. Consequently, this transition effectively redefined employees from "workers" to "architects" of the radio's soundscape.

4.2. The App as a Digital Nerve Center

Radio Istara learned a hard lesson: in 2026, an FM tower is just a piece of metal unless it is backed by data. Their Android app is now a strategic hub for the station. We observed a flawless real-time sync where metadata flowed from a server in Surabaya, hit the cloud, and landed on a listener's phone in seconds. This kills the "Data Ghost" that annoying lag where the song title on the screen does not match the audio. More importantly, it provides Istara with "Granular Analytics.".

The real-time synchronization of metadata from a server to listeners' apps, such as Istara's Android app, relies fundamentally on advanced time synchronization and data communication protocols that ensure minimal latency and accurate timing guarantees. Modern FM radio data communication can be enhanced through schemes like OFDM/FM frame synchronization, which encode synchronization info alongside data, allowing receivers to accurately acquire synchronization on a packet-by-packet basis and thus maintain data integrity during transmission over mobile radio channels [32]. This approach supports the data-driven functionality that transforms an FM tower from just hardware into a strategic digital hub by enabling real-time metadata delivery.

In distributed real-time systems, synchronization is crucial to ensure that distributed nodes (including the cloud and receiver) adhere to time specifications. This ensures that the metadata are transmitted consistently with millisecond-level precision, thereby avoiding deadlocks and timing errors [33]. Protocols and algorithms designed for heterogeneous and resource-constrained environments, such as IoT deployments, for time synchronization can also ensure the consistency of time control between different platforms, such as mobile applications that communicate with cloud servers [34]. These synchronization protocols and clock discipline algorithms align server and client clocks, enabling flawless real-time metadata flow to the listener’s phone.

The uninterrupted and precise flow of metadata leverages networked multimedia synchronization, which has evolved to support geographically distributed multimedia consumers sharing real-time content seamlessly. Inter-destination multimedia synchronization approaches are critical to ensure consistent metadata playback timing across distributed devices via the cloud, enabling interactive and socially connected listening experiences [35].

Istara’s flawless real-time sync between a Surabaya server, the cloud, and listener phones is an application of advanced time synchronization protocols, real-time communication frameworks, and multimedia synchronization standards that together transform traditional FM broadcasting into a dynamic, data-driven platform where the metadata synchronizes in seconds, making the FM tower a strategic digital asset rather than just a physical structure [32],[33],[34],[35].

4.3. Scalability: Can the Istara Model Be Exported

We were inspired by the success of Istara Radio to see if its model could work for smaller rural radio stations in Indonesia. Our findings suggest that the 60/30 hybrid model is a good fit for stations with tight budgets. By cutting back on the need for expensive, high-profile presenters, rural stations can use their limited funds to focus on investigative local news reporting. Istara Radio's success demonstrates that this model can be scaled down effectively, offering a promising solution for smaller stations with even tighter budgets. The real benefit here is that by minimizing the need for costly presenters, stations can redirect their financial resources to areas that have a bigger impact, such as local news investigations.

Although there is not much research specifically on the scalability of the 60/30 hybrid model in broadcast transmission, we can still learn a lot from similar hybrid models. These models often blend traditional and modern methods, which can boost scalability and maintain performance and costs. For example, consider hybrid switching designs in software-defined

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networks. They combine traditional aggregation routing with centralized control, which helps achieve scalable and optimal network performance and policy management. This approach effectively balances the workload and resource allocation [36].

Hybrid cloud infrastructure aims to cleverly combine private and public cloud resources to optimize resources within a limited budget. This approach demonstrates significant advantages when financial constraints and scalability requirements must be balanced [37]. For rural broadcasters, this means that they can enhance their capabilities by outsourcing routine tasks and standard processes to automated or more cost-effective systems. Consequently, they can concentrate their limited resources on producing high-quality and unique local content.

Furthermore, hybrid, scalable business models emphasize adaptability to changing market demands and resource availability. This highlights the potential for the sustainable scalability of hybrid organizations that integrate business and social objectives [38]. This adaptability aligns with strategies that reallocate resources from expensive live broadcasters (used for daily announcements) to local news reports. This increases the relevance and impact on the community without increasing operating costs.

The scalability of the 60/30 hybrid model depends on the strategic use of cost-effective automation technologies and low-skilled personnel for daily broadcasts. This saves resources and allows them to be reinvested in the creation of core content. This approach is particularly advantageous for rural radio stations with limited budgets because it enables scalable broadcast schedules and achieves an optimal balance between quality, cost, and localization. Further empirical analysis within the broadcasting industry will confirm and refine the assessment of the scalability of this model for rural broadcasters. Meanwhile, findings on hybrid scalability in network technologies, cloud computing, and hybrid organizations also support the hypothesis that the 60/30 hybrid broadcasting model can be effectively scaled to small rural television stations with limited budgets and resources.

4.4 The "Ambidextrous" Staff: Adapt or Fade

The AI takeover did not lead to mass layoffs; it forced radical reskilling. The team at Istara is becoming a new breed of "Ambidextrous Curators" creative souls who can also handle the cold logic of prompt engineering. They are no longer just "radio announcers"; they are the human-in-the-loop [2]. While ElevenLabs undertakes substantial computational tasks, humans continue to serve as cultural arbiters. Although artificial intelligence can replicate vocal characteristics, it lacks the capacity to comprehend the nuanced and culturally specific humor inherent in Surabaya jokes. By retaining humans as the ultimate editors, Istara ensures that the station preserves its cultural identity. [23]. This critical role, in which human judgment refines the AI output before broadcasting, is illustrated in Figure 2.

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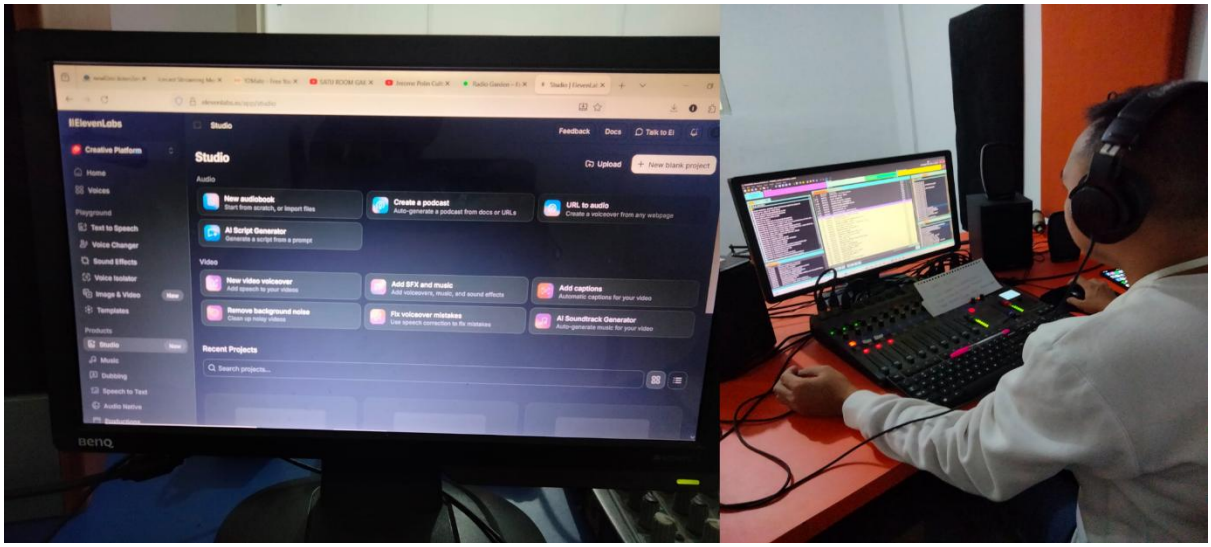

Figure 2 illustrates the 'Human-in-the-loop' process at Radio Istara, wherein a staff member serves as an 'Ambidextrous Curator,' meticulously refining the synthetic voice prompts and scripts generated by Eleven Labs before their deployment.

5. CONCLUSION

5.1 The Verdict: A Survival Play, not a Patch

Let us be blunt: what we saw at Radio Istara Surabaya was not a minor technical upgrade. It was a radical and gut-wrenching survival play. By boldly flipping their production to a 60/30 split between AI and human voices, Istara has effectively dragged regional radio into the future. They did not just "save money"; they bought back their freedom to be creative. Our findings prove that when RadioBOSS is combined with the "eerie" realism of ElevenLabs, the Uncanny The valley is not only crossed but also paved over. Efficiency is not just a percentage; it is a 100% boost in a station's ability to stay relevant.

5.2 A Field Guide for the Digital C-Suite

For managers still shivering in the shadow of the digital shift, Istara's "battle map" offers three clear rules:

1. Stop Fearing the Machine. AI can be used for the "grunt work" the endless news inserts and routine jingles. This frees your staff to do what humans do best: tell stories that mean something.
2. Metadata is Your New Master. If you are operating an FM tower without a data-rich mobile app, you are shouting into a void. Metadata is the only way to stay visible on a listener's phone.
3. Pivot the Talent. Don't fire your announcers; turn them into "Ambidextrous Curators." They must learn to whisper to an audience and "prompt" an AI simultaneously.

5.3 What We Still Don't Know

This study was not a catch-all. We focused on the high-mobility chaos in Surabaya. While the "Suroboyoan" soul worked here, other regions might face a different "cultural friction" with synthetic voices. A long-term question remains: Will listeners eventually tire of AI perfection? This is the next frontier for researchers.

5.4 Limitations and Future Horizons

While the findings are compelling, this study was limited to the urban area of Surabaya. Surabaya is known for its egalitarian and vibrant lifestyle, and its unique “Surabaya atmosphere” may be more receptive to the integration of AI than more traditional or linguistically complex areas. Furthermore, our 100% efficiency metric focuses on output rather than long-term listener engagement, the latter of which requires multi-year longitudinal studies for assessment. Future research should investigate listener fatigue after prolonged use of synthesized speech and analyze how different demographics, such as Generation Z and Baby Boomers, perceive the authenticity of AI-driven broadcast.

5.5 A Final Word

Radio is not dying; it is being fundamentally rewired. Istara Surabaya has shown that "gluing" global AI tech to a hyper-local heart isn't just a strategy it’s a lifeline. The future of airwaves will be a strange and beautiful blend of human warmth and algorithmic precision. In this new world, the only ones who will disappear are those too afraid to touch the "generate"

AUTHOR CONTRIBUTIONS

Harliantara: Conceptualization, Methodology, Investigation, Data Curation, Writing – Original Draft, and Project Administration. Widya Desary SW**,** Reza Ishadi Fadillah: Supervision, Validation, Writing – Review & Editing, Theoretical Framework Refinement. Didik Sugeng Widiarto: Formal Analysis, Validation, Software Logic Verification, Writing – Review & Editing.

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DECLARATION OF INTEREST

The authors declare no conflicts of interest in relation to the publication of this article. The use of brand names such as RadioBOSS and ElevenLabs in this study was purely for academic and technical analysis purposes.

DATA AVAILABILITY STATEMENT

The primary data supporting the findings of this study (anonymized interview transcripts and summary metadata logs) are available upon reasonable request from the corresponding author, while maintaining the confidentiality of the Radio Istara commercial data.

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