




Media innovation in low-density territories Strategies for the sustainability and recovery of local radio stations

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Abstract

Local and regional community news media are essential to preserving cultural identity, promoting community engagement, and ensuring the dissemination of information, particularly in low-density territories. However, these outlets face challenges due to financial constraints, technological limitations, and human capital shortages. This study analyses the strategies and practices adopted by local radio stations operating in such contexts, with particular attention to the role of media innovation in enhancing sustainability and competitiveness. Methodologically, the research employs a mixed-methods design combining quantitative data from a structured survey and qualitative insights from document analysis. The empirical work covers radio stations from Portugal, Republic of North Macedonia, Slovakia, and Croatia. The survey focused on organisational structure, financial models, digital engagement, and professional development needs, while the document analysis explored contextual and regulatory challenges. The results indicate that local radio stations in low-density areas are confronted with ubiquitous financial constraints, restricted technology incorporation, and insufficient professional training. Despite these challenges, innovative responses are emerging. These include community-based funding models, inter-organisational collaboration, and the adoption of digital platforms for content distribution. The findings also reveal gaps in digital literacy among staff, underlining the necessity of targeted training initiatives. The discussion underscores the transformative potential of digital innovation in addressing structural limitations and enhancing audience involvement. Collaborative networks are identified as key to overcoming isolation and fostering the sharing of expertise and resources. In conclusion, while community media in low-density territories face systemic constraints, strategic innovation can significantly enhance their sustainability and relevance. The study recommends increasing financial support mechanisms, fostering digital literacy, strengthening collaborative practices, and investing in technology-driven solutions. These strategies are essential to ensuring that local radio stations continue to serve their communities in low-density territories amidst the evolving digital landscape.

Keywords: Media innovation, Low-density territories, Local radio sustainability, Digital transformation, NEWAVES.

Introduction

Local radio stations play an important role in fostering community cohesion and preserving cultural identity, particularly within low-density territories. These communities, characterised by sparse population densities and limited commercial activities, rely on local media to remain informed and engaged. In such contexts,

local radio stations function as a vehicle for locally relevant news, cultural promotion, and civic dialogue. By addressing community-specific issues and promoting regional narratives, these stations reinforce social bonds, bridge generational divides, and foster shared sense of belonging (Born & Prosser, 2001; Howley, 2010; Anderson et al., 2015).

Over the last decades, the adaptability of radio communication has been evident, particularly in how it complements multitasking, and provides continuous, accessible information. Local stations offer round-the-clock service and are well-positioned to present local news in a relatable manner, speaking directly to the experiences of their listeners. This proximity helps build trust and positions local radio as a mediator of collective memory and conflict resolution (Bird, 2009; Fenton, 2010).

However, the acceleration of digital transformation has introduced new challenges. Local radio stations face increasing competition from global platforms and urban-based media conglomerates, both of which benefit from superior technological infrastructure, larger audiences, and more robust financial backing (Curran, 2010; Pickard, 2020). The resulting structural imbalance has left many local stations struggling to adapt. Although some have successfully incorporated digital tools, many continue to face technological, financial, and human resource limitations (Napoli, 2011; Hendy, 2013; Nielsen, 2015).

Media innovation is broadly understood as the development and implementation of novel technologies, practices, or business models that allow media organisations to respond to evolving audience behaviours and digital ecosystems (Storsul & Krumsvik, 2013; Harbers et al., 2024). This includes the adoption of digital platforms, new content formats, and participatory strategies aimed at enhancing sustainability and relevance. In low-density territories, however, innovation is often constrained by structural limitations, yet it remains essential for ensuring the vitality and long-term viability of community-based communication (Ozgun & Broekel, 2021).

In this context, the NEWAVES project, funded by the Creative Europe Programme, proposes a collaborative framework for enhancing the sustainability of local radio in Portugal, North Macedonia, Slovakia and Croatia. This paper analyses part of the project's results, focusing on four key dimensions: financial sustainability, digital literacy, audience engagement, and institutional collaboration. Through this comparative perspective, the study contributes to understanding how innovation can help secure the future of community radio in digitally evolving and structurally constrained environments.

Literature review

Local radio stations in Europe are essential for promoting media diversity, community involvement, and democratic representation in different regions (Midões, 2021; Anderson et al., 2020; Meier et al., 2022). These stations differ from national broadcasting networks, which often deliver standardised content that appeals to a broad audience. However, local radio stations provide programming that reflects the specific needs, culture, and identity of smaller communities (Backhaus, 2022; McMahon, 2021). This focus on local content enables these stations to address issues, interests, and narratives specific to their audiences, which not only strengthens regional identity but also promotes a more inclusive media environment (Forde et al., 2002). Local radio serves as a cultural repository, preserving regional dialects and stories that might be lost within the larger context of national or global platforms (Rodriguez et al., 2014; Carpenter, 2020).

Historically, European local radio emerged as a way of improving the public sphere, providing regional voices, and reducing the monopolistic tendencies of national broadcasting frameworks (Horowitz et al., 2022; Mathisen, 2023). This emergence may be traced to the mid-20th century, when the demand for media diversity and regional representation prompted the creation of community-orientated broadcasting formats. During this period, policy changes encouraged the growth of community broadcasting as a response to the centralisation of media, acknowledging the importance of providing a platform for alternative voices in order to enrich democratic discourse (Hendy, 2013). Thus, local radio emerged as both a medium for representation and a tool that empowers residents by amplifying their voices and promoting civic engagement. This emphasis on local media has continued to shape the European media landscape, highlighting the importance of preserving community-orientated radio in the face of commercial and national media (Brevini, 2013).

Over the last decade, although there has been a transition in media consumption to digital platforms and streaming services (Laor, 2022; Van et al., 2021), radio consumption across Europe has increased, demonstrating the adaptability of local radio stations in the digital era. This increase underscores the distinctive role of local radio as a medium that sustains its relevance through the incorporation of digital technologies while preserving its regional appeal (MacMahon, 2021; Piñeiro-Otero & Martín-Pera, 2022). Many have adopted digital innovations, such as online streaming and podcasting, which expand their appeal to younger audiences (Jerónimo et al., 2020). This digital adaptation has allowed radio stations to connect with consumers outside traditional broadcasting constraints, reaching younger populations that prefer digital consumption (Powers & Vera-Zambrano, 2018). However, while digital integration has broadened the accessibility of local radio, the main function of these stations has remained unchanged: they continue to serve as accessible, trusted sources of information and cultural expression, reinforcing social cohesion within their communities (Attuh & Kanham, 2022).

In contrast to global media platforms, local radio is frequently seen as a reliable source of information due to its commitment to community issues and its understanding of the local context (Coyer, 2007; Gaynor & O'Brien, 2017). This relationship of trust is particularly important in rural and remote areas, where radio functions as a principal source of information and connection (Hendy, 2013). For listeners, the proximity and expertise of local radio stations are instrumental in fostering a sense of belonging and connection (Krause, 2020; Backhaus, 2021).

Therefore, European local radio stations are acknowledged for their contributions to media diversity and community engagement. They represent local culture and disseminate accessible information, ensuring that localised voices remain prominent. The integration of traditional broadcasting principles with digital interactivity enhances the importance of local radio within a progressively advanced technological and global media landscape (Nielsen & Ganter, 2022).

Conceptualisation of media innovation

Media innovation is broadly understood as the development and implementation of new technologies, practices, or organisational models that allow media outlets to respond to transformations in audience behaviour, industry structure, and digital ecosystems (Storsul & Krumsvik, 2013; Harbers et al., 2024). It can manifest through the adoption of digital platforms, participatory formats, immersive storytelling, or

structural change in production workflows. Importantly, innovation in media is not limited to technological updates, but includes editorial, cultural, and professional adaptations shaped by institutional, social, and geographical context (Ozgun & Broekel, 2021; Solvoll & Olsen, 2024).

In recent years, several European projects and reports have documented innovation initiatives in community and local media. For instance, the NEWAVES project, co-funded by the Creative Europe programme, promoted collaborative strategies and digital training among radio stations operating in low-density territories. The MediaMotorEurope accelerator supported media-tech startups that developed AI-powered solutions to enhance newsroom efficiency and digital transformation. The Stars4Media programme encourages cross-border collaboration and skills development among young media professionals and organisations, fostering innovation in editorial workflows and audience engagement. In addition to public funding mechanisms, international private initiatives such as the Google News Initiative's Innovation Challenges have supported small and medium-sized media outlets in Europe, including local and community organisations, by financing digital innovation projects and audience-centred strategies. Collectively, these programmes demonstrate how innovation is being actively promoted beyond major urban centres, particularly in contexts where structural limitations pose significant challenges to the sustainability of community-based media.

Media innovation in low-density territories

Despite efforts to support innovation, media organisations in low-density territories continue to face significant structural constraints. These include limited digital infrastructure, restricted funding, a shortage of qualified personnel, and population ageing (Correia et al., 2024; Galeva & Stojanov, 2024). Nevertheless, such challenges also create opportunities for context-driven innovation, often rooted in hyperlocal strategies, collaborative networks, and community engagement models (Carpentier, 2011, Carson et al., 2016). These environments foster adaptive models that respond to local needs with creativity and resilience. Hyperlocal strategies and digital platforms help local media organisations to overcome geographic fragmentation and serve dispersed audiences (Stúr et al., 2018; Crittenden, 2020). Digital platforms enable media in low-density areas to adapt to changing consumption trends, address audience dispersion, and foster a local identity. They provide accessibility and responsiveness to both locals and tourists, ensuring interactions beyond demographic boundaries. Digital technologies enhance the sense of localisation and belonging, reinforcing local identity (Melo, 2024). Thus, media innovation in these areas improves local information dissemination, supports democratic participation, and promotes an inclusive community. This participative model empowers communities, establishing local media as an element of regional identity and a manifestation of democratic expression (Carpentier et al., 2013).

Digital platforms, mobile journalism and social media offer cost-effective and participatory tools for innovation in local media (Nah, 2021; Shukla, 2024). These instruments enable content co-creation, enhance responsiveness, and foster inclusive public dialogue. They are particularly valuable for overcoming geographic isolation and engaging residents as active participants in the production of community narratives (Tsfati & Peri, 2006; Berry, 2016).

Partnerships with local institutions, such as universities, municipalities, and civic organisations, provide access to training, infrastructure, and complementary resources (Jankowski & Prehn, 2002; Baines, 2012). Collaborative content production, rooted in local knowledge and shared responsibility, enhances the relevance, quality, and sustainability of media initiatives (Howley, 2010). By examining these dynamics, this study aligns with current debates on media innovation in peripheral regions, highlighting how structural limitations can be mitigated through strategic collaboration and adaptive digital practices.

Challenges for local media

Digitalisation provides local radio stations in low-density areas with both advantages and challenges. Given the increasing prevalence of digital media platforms and changing media consumption trends, local radio stations must adopt technologies that enable wider and more varied audience reach. Many stations face considerable challenges in their digitisation initiatives, primarily due to a lack of necessary technological infrastructure, specialised expertise, and financial resources to facilitate the acquisition and implementation of appropriate digital tools (Gordon & Meikle, 2015; Midões, 2021).

Local radio stations consistently face challenges in financial viability due to the restricted number of local companies capable of investing in advertising. This situation sometimes occurs when competitors use digital platforms and national networks, which absorb a substantial part of advertising investments, leaving smaller stations with limited resources. This dependence on advertising renders local radio stations susceptible to economic crises, particularly in areas with minimal commerce and limited consumer purchasing power, as is typical in low-density territories (Evens & Paulussen, 2012; King, 2017). Furthermore, local radio stations have restricted access to external funding or specific subsidies that might enhance their financial stability. Although some stations receive occasional support from governments or European organisations, these subsidies are typically insufficient to cover operating expenses, including personnel costs, equipment maintenance, and the acquisition of new technology. The lack of economic support impedes radio stations' capacity to invest in innovation and expand their operations through the integration of digital platforms and new programming formats, which are essential for attracting younger listeners (Foxwell, 2007; Buckley et al., 2008). Consequently, the digitisation process in the broadcasting sector is an issue for many local radio stations. A significant proportion of radio stations use analogue technology and do not have the necessary digital infrastructure to meet the demands of contemporary listeners, who increasingly consume content on digital platforms. Financial and human resource constraints also limit the transition to digital platforms that attract and retain digital audiences (Bosch, 2014; Starkey, 2017).

Local radio stations also face difficulties in recruiting and retaining skilled professionals who can work with new technology. The lack of personnel proficient in digitalisation, digital marketing, and online content constrains their ability to innovate and compete with other media. The absence of these skills directly affects broadcasters' capacity to adapt to consumer trends and capitalise on opportunities presented by digitisation, including monetising online programming and expanding reach beyond local boundaries (Tacchi, 2000; Correia et al., 2024). Therefore, insufficient personnel resources and training pose significant challenges to many radio stations. Furthermore, professionals handle multiple functions, which leads to narrow specialisation and reduced operational efficiency. Additionally, these professionals face challenges in retaining their skills and adapting to the evolving demands of the digital media sector. A deficit in key

competencies, such as digital content generation and social media management, is a result of the small number of young professionals choosing careers in local radio and the limited professional development opportunities available (Almeida & Viana, 2020).

Another common challenge is the difficulty of engaging younger audiences. The absence of a digital presence and limited use of platforms popular with young people contribute to this problem. Younger generations favour flexible, customised online content, which leaves local radio stations at a disadvantage. The traditional linear broadcast model frequently fails to correspond with the consumption option, reducing local radio stations' ability to maintain their relevance and attractiveness (Abramson, 2014; Galán et al., 2022). The absence of a proper digital marketing strategy and the restricted online presence of local radio stations intensify this disconnection with younger audiences. This scenario highlights the urgent need for training in digital marketing and content production to attract and retain a younger audience, ensuring the station's sustainability (Teixeira & Silva, 2011; Bonini, 2014). Training areas such as technology, marketing, and digital engagement allow these stations to adapt to today's competitive environment. However, limited funding hinders the provision of frequent or specialised staff training, thereby preventing local radio stations from modernising effectively. Therefore, investing in training programs and establishing partnerships with other institutions to develop digital skills can be an effective strategy to improve operations and ensure the sustainability of local radio stations (Hallet & Hintz, 2010).

We established the subsequent research hypotheses:

- H1: The deficiency of financial resources restricts local radio stations from investing in digital infrastructure.
- H2: The absence of digital marketing strategies impacts local radio stations' capacity to engage with younger audiences.
- H3: Institutional partnerships strengthen the digital skills of local radio stations.
- H4: The adoption of digital technologies broadens the reach of local radio stations and attracts younger audiences.

Methodology

This study adopted a mixed-methods research design that combines both quantitative and qualitative approaches to provide a comprehensive understanding of the innovation challenges and opportunities in local radio stations across low-density territories. Data collection was based on a structured survey applied to local radio stations in Portugal, North Macedonia, Slovakia, and Croatia, complemented by document analysis of institutional reports and media policy frameworks.

The survey instrument was developed within the framework of the NEWAVES project and structured into four thematic blocks: (1) organisational structure and human resources; (2) technical infrastructure and digital integration; (3) financial sustainability and revenue models; and (4) perceived needs in areas such as training and technological development. The questionnaire included quantitative metrics (e.g., percentage breakdowns, employee counts), binary (yes/no) questions, and open fields for qualitative commentary. Instructions were provided in a foreword to ensure coherence in data collection, guiding national partners in selecting radio stations aligned with the project's training and innovation goals.

Radio stations were selected through purposive sampling based on the following criteria: (a) willingness to engage in programme and service innovation; (b) availability of human and technical resources; (c) geographical proximity to a higher education institution's partner alliance; and (d) budgetary relevance for potential support or intervention. Partners in each country were responsible for identifying stations most likely to benefit from the project's activities.

Out of the 150 radio stations contacted, 75 provided valid responses, corresponding to a 50% response rate. This limited sample size introduces certain methodological constraints. First, the results may reflect response bias, particularly with respect to indicators such as gender equality, inclusion, and digital capacity, which rely on self-assessment. Second, reluctance to disclose sensitive financial information may have reduced participation or influenced response accuracy. Third, differences in national reporting cultures and terminologies may affect cross-country comparability.

To mitigate these limitations, follow-up contact was made with non-responding stations, and culturally adapted versions of the survey were distributed in each country's official language. In addition, document analysis supported the validation of key findings and provided contextual insights, especially regarding regulatory, financial, and institutional conditions in each country. The benchmarking approach, though constrained by partial coverage and reliance on self-reported data, yielded valuable information on the operational, financial, and strategic dimensions of local radio stations in low-density territories.

Results

Empirical findings from the survey conducted across Portugal, North Macedonia, Slovakia, and Croatia highlight a combination of shared and context-specific challenges affecting local radio stations. Across all territories, financial dependence on traditional advertising, limited investment in digital infrastructure, and reduced professional development opportunities are evident. Simultaneously, the adoption of digital tools, workforce composition, and the use of new media formats vary considerably across national contexts. A comparative overview of key indicators is presented in Table 1 to offer a cross-sectional interpretation of these dynamics. This is followed by a country-by-country analysis to examine how structural conditions and innovation practices materialise at the local level.

Table 1: Comparative overview of local radio stations per country.

Country	Avg. Staff Size	% Needing Digital Training	% Using Podcasts	% Digital Revenue	% Active Website Social Media	Main Revenue Source
Portugal	3-4	81%	52%	19%	77%	Advertising (85%)
North Macedonia	<3	86%	Not specified	Not specified	43%	Advertising (>50%)
Slovakia	Mostly part-time	67%	100%	Minimal	33%	Advertising
Croatia	<5	80%	<20%	<15%	15%	Advertising (70-80%)

Source: Gonçalves et al. (2023).

While the table provides a comparative snapshot, a more detailed examination of each national context enables a deeper understanding of how structural constraints and innovation strategies manifest locally. The following country-level analyses present key findings from the survey, organised thematically to explore financial models, technological integration, human resources, and audience engagement within each territory.

Portugal

Local radio stations in Portugal face significant challenges, with advertising revenues dominating their income sources. The analysis of the survey reveals that salaries and operational costs, accounting for 85%, are the primary expenses, leaving minimal space for investment in technology improvements or staff training. Furthermore, 65% lack awareness of their monthly audience rating, indicating insufficient investment in market research and strategic planning.

Technological adaptation also remains a key obstacle. 76% of radio stations do not incorporate digital news sharing platforms due to a lack of familiarity with these tools and a deficiency in human resources. This knowledge gap impedes their ability to leverage the full potential of digital platforms for content distribution and audience engagement. There is a recognition of the significance of social media platforms. All the radio stations possess Facebook profiles, and 77% of them maintain an active website.

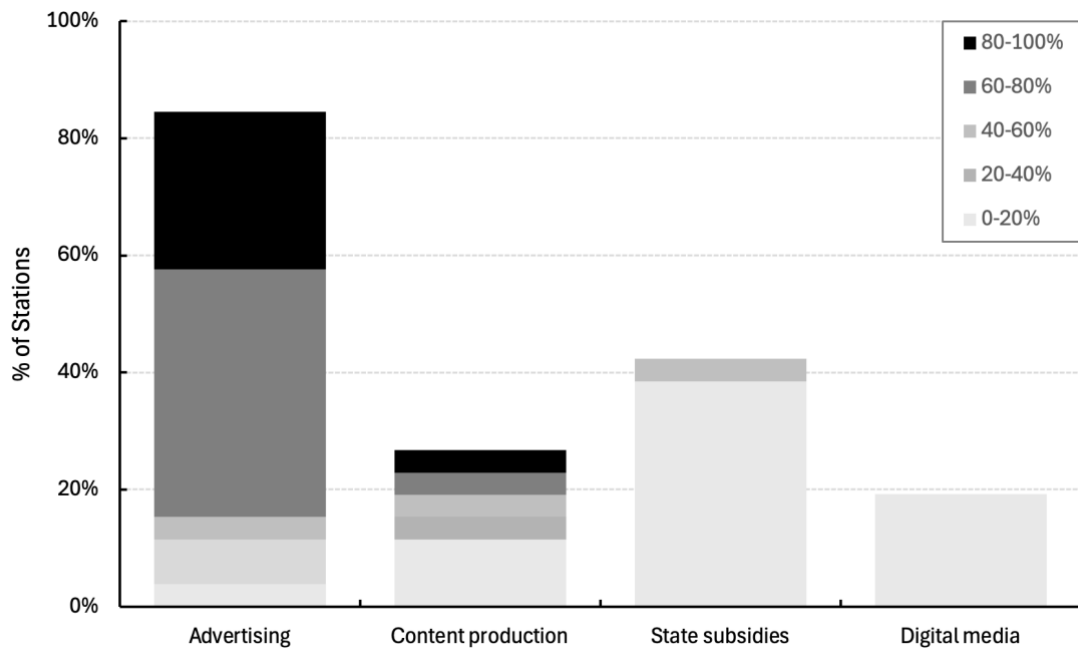
The digital knowledge gap further limits the potential for innovation, with 81% of surveyed stations reporting lacking familiarity with digital tools or sufficient technical expertise. Human resources are constrained, with a local station typically employing an average of three to four staff members. Furthermore, 81% of stations identified training needs in digital skills, advertising, and entrepreneurship. However, financial limitations restrict access to capacity-building initiatives, thus reducing opportunities for professional development.

These challenges are also reflected in the distribution of financial resources. Figure 1 shows that traditional advertising is the main source of income for most stations, especially in the higher revenue brackets (60-100%). Other funding sources, such as content production, subsidies, and digital media, are limited and mostly concentrated in the lower income ranges (0-40%).

This analysis is based on a targeted sample of 26 local radio stations operating in low-density territories. Out of 90 stations initially contacted, these 26 provided detailed responses, providing valuable insights into the landscape of local radio in these regions. The distribution shown in Figure 1 confirms a dependence on conventional funding models and a marginal use of alternative or innovation-oriented revenues sources.

Traditional advertising accounts for 85% of local radio revenues, while 19% of stations report revenue from digital sources. This reflects a limited implementation of digital revenue strategies, highlighting a gap in the sector's efforts to diversify its income in considering changes in media consumption trends.

Figure 1: Financial resources distribution - Portugal



Source: Gonçalves et al. (2023).

Despite these challenges, there is a clear recognition of the importance of adapting to digital innovation. Over 60% of stations plan to update their sound identity, signalling a commitment to remaining pertinent to contemporary consumers. However, 56% of stations depend on internal resources for these changes, which may limit their effectiveness due to resource and expertise constraints. The lack of investment in podcasting further hinders moderation efforts; 48% of stations are not producing podcasting content, primarily due to staffing and equipment limitations.

Republic of North Macedonia

The financial sustainability of local radio in North Macedonia remains a challenge, with advertising revenues heavily concentrated among national broadcasters. This disparity leaves local stations with limited resources, as advertising often accounts for more than half of their total income. For instance, while the highest-earning station reported an income of 5.07 million denars, the lowest earned just 0.03 million denars. Furthermore, employee salaries consume a significant portion of these revenues, ranging from 40% to 80%, leaving insufficient funds for operational costs and technological investments.

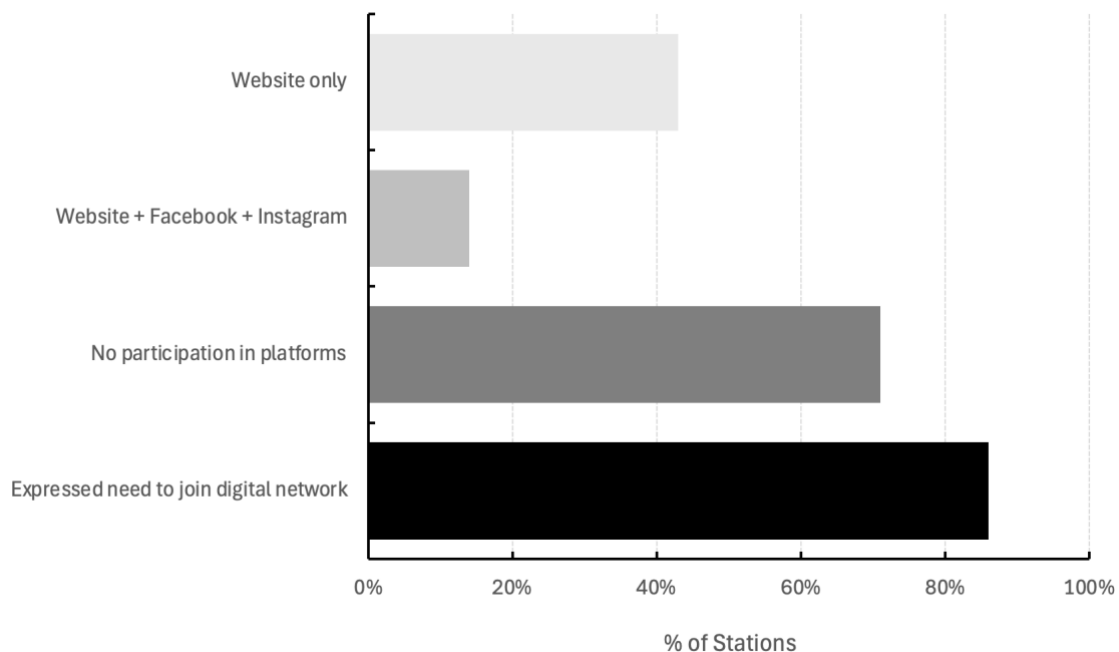
The digital transition presents another pressing issue for local radio stations. Although the introduction of the DAB+ standard by the Macedonia Public Broadcasting Enterprise represents a step forward, local stations have yet to adopt this technology. High infrastructure costs, estimated at 2.5 million euros over three years, combined with the expense of digital receivers, which range from 20 to 100 euros, create substantial barriers. Additionally, a lack of engagement with digital platforms is evident, as 71% of surveyed stations are not a part of any news-sharing or educational networks. Despite this, 86% of stations expressed a need for such platforms, indicating a clear interest in leveraging digital tools to improve their operations.

The workforce at local radio stations is characterised by limited capacity and minimal development opportunities. Most stations operate with fewer than three journalists, and employees under 30 years old make only 4% of the workforce. Additionally, just one-third of staff members have formal training in journalism or public relations, further constraining the station's ability to adapt to new challenges. Opportunities for professional development remain scarce, compounding the issue of sustainability in human resources.

Listenership trends show a decline, influenced by the growing popularity of digital platforms such as Spotify, Apple Music, and social media networks. Survey data reveals that over 60% of local stations report a daily reach below the national average, with overall listenership declining since 2019. This decline correlates with stagnating advertising revenues for radio, while digital platforms continue to grow their market share. Despite their challenges, local stations have yet to fully embrace digital strategies, which limits their ability to compete in an evolving media landscape.

Social media and online platforms offer potential avenues for growth, yet their integration remains inconsistent among local radio stations. While 86% of stations produce news content, only 43% use platforms beyond a basic web presence. As illustrated in Figure 2, 43% of stations maintain only a website, 14% combine a website with social media, and 71% are not part of any content-sharing platform. Nevertheless, 86% express a desire to join such networks. This underutilisation restricts their ability to engage with broader audiences and capitalise on digital advertising opportunities. Moreover, unregistered online portals dominate the advertising market, presenting unfair competition to traditional media.

Figure 2: Types of digital presence - North Macedonia



Source: Gonçalves et al. (2023).

Regularity and structured challenges also impede progress. The current legal framework, designed for analogue broadcasting, does not adequately address the needs of digital media. This misalignment limits

the ability of local radio stations to innovate and adapt to technological advancements. Additionally, a lack of supportive measures to ensure fair competition exacerbates the struggles faced by local broadcasters.

Slovakia

Vulnerability and resource constraints characterise the financial situation of local radio stations in Slovakia. Advertising remains the primary source of revenue, with approximately 19 million euros distributed across the radio sector annually. However, smaller local stations face significant challenges in attracting advertisers due to the dominance of national broadcasters and powerful media groups. Data from 2022 reveals that 21% of 19 local radio stations operated at a loss, while 37% reported profits of less than 2,000 euros. Insufficient diversification of income sources further compounds this financial fragility, as the majority of revenue comes solely from advertising alone, with minimal contributions from grants, donations, or alternative funding models.

Technological advancement, particularly the transition from analogue to digital broadcasting, presents both challenges and opportunities for local radio stations. While national and public broadcasters have adopted digital broadcasting, local stations have yet to make this transition. High costs, including the need to maintain both analogue and digital systems during the transition period, hinder the process. Moreover, digital broadcasting requires listeners to own compatible receivers, which are not widely available in Slovakia, especially in older vehicles and homes. This lack of access exacerbates the challenges faced by local stations in maintaining their audience base while adapting to new technological standards.

Human resources limitations further constrain the capacity of local radio stations to innovate and expand. Many stations employ staff on a part-time basis, making it difficult to build long-term expertise or invest in human capital. Survey data shows that 67% of local radio employees express a strong desire for training in areas such as moderations, marketing, and journalist ethics. However, financial constraints and the absence of structured professional development opportunities have resulted in a workforce that struggles to meet the demands of a rapidly evolving media environment. This issue is compounded by the tendency of many stations to be self-playing, offering primarily automated music playlists without original programming or moderated content.

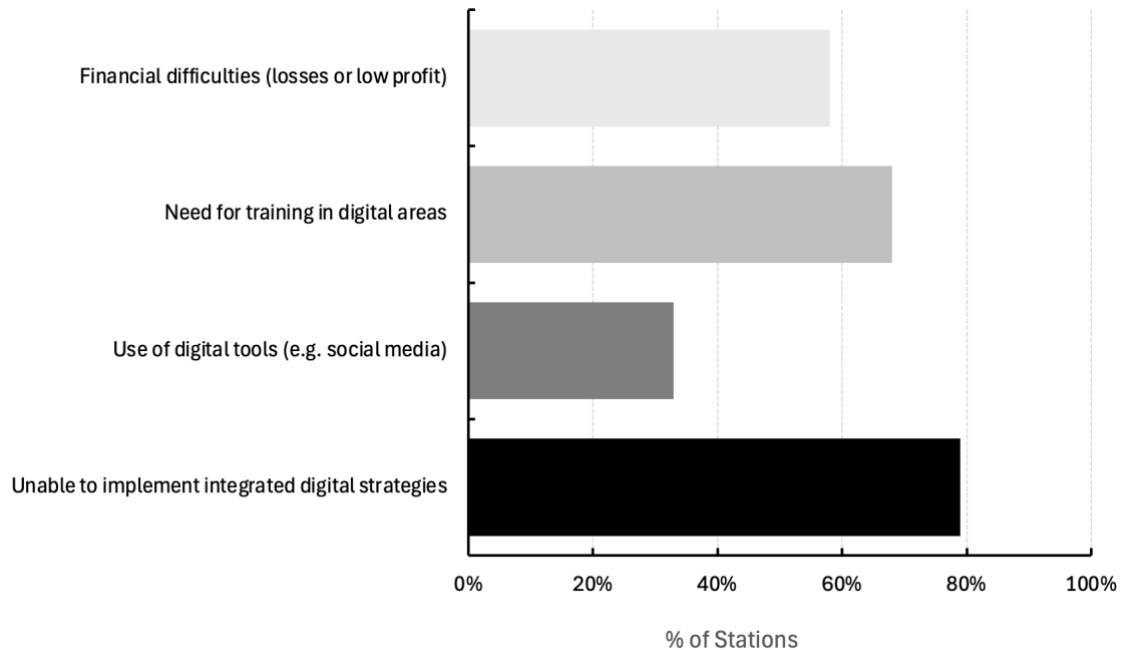
The rise of digital media and new platforms has intensified competition for local radio stations. Platforms such as Spotify and social networks like Facebook and Instagram are capturing younger audiences, contributing to a decline in traditional radio listenership. Over the past five years, advertising expenditure on radio has decreased slightly, now accounting for approximately 43%, nearly matching television at 45%. Despite this shift, 33% of local radio stations have made efforts to integrate digital tools, such as social media, into their operations, but many continue to lag behind.

The regulatory system in Slovakia has yet to fully address the challenges posed by digital transformation. While strategies for the transition to digital broadcasting exist, implementation has been slow, and support for local broadcasters remains limited. Licencing requirements for traditional media contrast starkly with the unregulated nature of online content creation, placing local radio stations at a disadvantage.

Figure 3 summarises key indicators related to financial fragility, workforce capacity and digital engagement among Slovakia's local radio stations. The data reflects a high percentage of stations with minimal profit

margins, limited integration of digital tools, and a significant gap between the desire for innovation and the ability to implement it.

Figure 3: Key indicators of financial and digital capacity - Slovakia



Source: Gonçalves et al. (2023).

Furthermore, economic crises, such as the COVID-19 pandemic and the recent energy crisis, have highlighted the financial fragility of local radio stations. During the pandemic, revenue losses for local stations reached up to 100%, compared to 60%-80% for national broadcasters with strong economic backing. Despite these challenges, some local media have adopted innovative strategies to ensure sustainability. For instance, Radio Košice has diversified its operations by integrating radio, television, and online news portals under one management structure. However, such examples remain exceptions rather than the norm, with 79% of local stations lacking the resources or knowledge to pursue similar strategies.

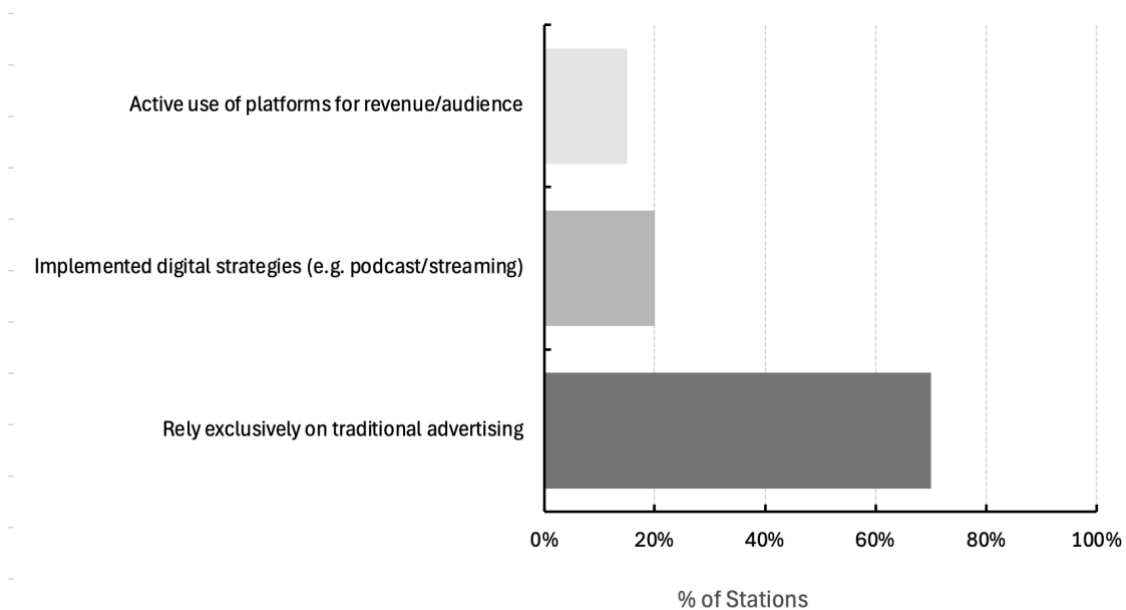
Croatia

Local radio stations in Croatia face challenging financial conditions, with advertising serving as their primary revenue source and accounting for 70%-80% of their total income. However, national and regional broadcasters with stronger signals dominate the market, leaving local stations with a smaller share. Survey data indicates that 42% of local stations struggle to achieve profitability, and many rely on subsidies or co-financing through the Pluralism and Media Diversity Fund. Despite these supports, 30% of local stations are experiencing recurring financial difficulties due to uneven resource distribution and limited diversification of income sources.

Technological adaptation and digitalisation pose significant hurdles for local radio stations. Despite larger broadcasters increasingly integrating internet platforms and streaming services into their operations, 60% of local stations report lagging behind in adopting these technologies. Investment in digital infrastructure

remains low, with less than 20% of stations implementing digital content strategies such as podcasts or online streaming. While most stations maintain websites and social media profiles, only 15% actively use these platforms to diversify revenue or engage with audiences. The cost of digital receivers and limited public awareness of digital radio options further exacerbate these challenges. As shown in Figure 4, the integration of digital tools remains limited among local radio stations, with a clear predominance of traditional advertising models.

Figure 4: Access and use of digital strategies - Croatia



Source: Gonçalves et al. (2023).

Human resources in Croatia's local radio sector are under strain, with small teams and limited professional development opportunities. Survey data reveals that 75% of local stations employ fewer than five staff members, and part-time employment is common, making it difficult to attract or retain skilled professionals. Only 35% of employees hold relevant qualifications, indicating a lack of formal education in journalism. Additionally, 80% of surveyed stations expressed a need for training in areas such as digital content creation, marketing, and audience engagement, but budgetary constraints hinder the provision of such programs. Audience preferences are shifting to digital media platforms such as Spotify, YouTube, and social networks gaining popularity, leading to a decline in traditional radio listenership. Research indicates that daily radio listeners have fallen to 25% of the population, while internet usage for accessing news and entertainment has risen to 72%. Consequently, advertising revenues are shifting toward digital platforms, which now account for 45% of the total advertising market in Croatia, compared to radio's 6% share. Despite these trends, 70% of local stations continue to rely exclusively on traditional advertising models, limiting their competitiveness in the evolving market.

Regulatory challenges further impede the growth of local radio stations. Croatia's regulatory framework promotes media pluralism through public subsidies and co-financing initiatives. Additionally, unregulated online platforms create unfair competition, capturing significant advertising market share without adhering

to licensing or operational requirements. This disparity places local stations at a disadvantage, as they must comply with stringent regulations while competing with unlicensed digital entities.

Despite these challenges, a few local radio stations have adopted innovative approaches to ensure sustainability. For example, stations that integrate multiple media formats, such as radio, online news portals, and social media, have seen moderate success in expanding their reach and diversifying income streams. However, such examples are the exception, with 20% of local stations lacking the resources or strategic direction to implement similar models.

Conclusion

The results of this research provide an understanding of the challenges and approaches necessary for the sustained profitability of local radio stations within an emerging digital landscape. Some surveyed stations reported that substantial financial constraints prevent them from allocating resources to digital upgrades. Larger urban and national platforms, which collectively dominate advertising income, compound the issue, resulting in limited financial resources for local stations (Curran, 2010). The study indicates that dependence on conventional funding sources and limited digital presence hinder these stations from fulfilling the expectations of young consumers. Local radio stations face financial constraints that restrict their capacity to invest in digital infrastructure, validating H1 (Anderson et al., 2020; Evens & Paulussen, 2012).

Committed to digital development, local radio stations can reach diverse audiences, including younger listeners. However, the results show that a segment of local radio stations lacks the requisite knowledge and resources needed to develop effective digital marketing strategies, which limits their visibility on social media platforms, where the youth mostly interact (Gaynor & O'Brien, 2017). We verified the H2, which asserts that the absence of a digital marketing strategy affects local radio's capacity to engage with younger audiences. The results underscore the necessity of implementing digital marketing initiatives for these stations to sustain their relevance and attract diverse audience segments in low-density territories (Bonini, 2014).

Forming partnerships with educational institutions, local governments, and businesses has demonstrated efficacy in resource sharing and skill development, thereby supporting the advancements of digital and operational resources and validating H3 (Jankowski & Prehn, 2022; Carpentier, 2011). These partnerships are essential for managing the resource limitations frequently faced by local stations, reinforcing their ability to respond to changing media demands, and allowing them to maintain their cultural and informational relevance.

The research corroborates H4, stating that the adoption of digital technologies expands the reach of local radio stations beyond traditional geographical boundaries. Research has demonstrated that the integration of digital platforms, including online streaming, social media, and podcasting, increases audience engagement and circumvents the limitations faced by local radio stations (Jerónimo et al., 2020). A digital integration is an important strategy for engaging younger and more dispersed audiences while also reinforcing the local identity of the radio station and the community.

This research indicates that local radio stations in low-density territories face major issues with financial, technological, and human resources; nonetheless, there are strategies that can improve their sustainability

and strengthen their relevance. The results underscore the importance of tailored financial support, digital engagement, and institutional cooperation as approaches for assisting local radio stations in overcoming structural limitations and strengthening their role as reliable sources of local information and promoters of community identity. Financial assistance, whether through community-based funding initiatives or governmental subsidies, has emerged as a factor for enabling these stations to invest in necessary infrastructure and maintain basic operational stability. Similarly, digital engagement, encompassing social media, online streaming, and other platforms, enables these stations to expand their reach beyond geographic limitations and reach a more diverse and younger audience segment, essential for the stations' sustainability and adaptation in a competitive media environment.

Furthermore, the study reveals that institutional collaboration, particularly with educational institutions, civic organisations, and local governments, provides resources and knowledge to improve the gaps in technical skills and digital literacy observed in these matters. These partnerships provide opportunities for skill development and create support networks that reinforce the operational resilience of local radio. This collaborative approach is necessary to overcome human capital limitations by providing continuous training and information sharing, which in turn facilitates digital adaptation initiatives.

Additionally, the research reflects that digital technologies have innovative potential to transform local radio stations, reshaping both operational processes and audience interactions. Digital tools enable these stations to implement innovative content strategies, such as mobile journalism and hyperlocal reporting, that interact with the local audience and foster a sense of community ownership. However, while digital integration has advantages, the research underscores that effective implementation requires continuous support through financial resources, digital training, and strategic guidance.

Our results suggest that further research should explore the long-term impacts of digital adoption on local radio sustainability, focusing especially on audience retention, loyalty, and engagement metrics. This future research could provide more profound insight into the influence of digital tools on audience dynamics, particularly in low-density territories, and how stations can leverage these technologies to develop adaptable digital models that suit modern audience requirements. It is essential to identify solutions that enable local radio to not only survive but also grow while protecting its distinctive contributions to media diversity, cultural preservation, and community participation amidst fast digital disruption.

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