Digital innovation to support local radios in low-density territories through NEWAVES project

Joaquim Brigas*, Jorge Gonçalves**, Handerson Engrácio***, Filipe T. Moreira****, Fátima B. Gonçalves*****

* Guarda Polytechnic University, IMEDIALAB, Guarda, Portugal (joaquimbrigas@ipg.pt)
** Guarda Polytechnic University, Guarda, Portugal (jgoncalves@ipg.pt)
*** Guarda Polytechnic University, Guarda, Portugal (hengracio@ipg.pt)
**** Guarda Polytechnic University, Guarda, Portugal (filipertmoreira@ipg.pt)
***** Guarda Polytechnic University, IMEDIALAB, Guarda, Portugal (fgoncalves@ipg.pt)

Abstract

The digital age has brought about a revolution in how we consume media and entertainment. The NEWAVES project addresses the challenges faced by local radio stations in low-density population areas, which remain vital for communication and community culture despite the digital revolution. These stations often struggle with underfunding, limited workforce, and fragmented resources due to a lack of collaboration. Co-financed by Creative Europe, NEWAVES unites partners from Portugal, Croatia, Slovakia, and North Macedonia, recognizing shared challenges across these regions. This article evaluates the NEWAVES project, which aims to support and revitalise local radio stations in these regions by creating a national and international network. The NEWAVES platform enables local radio stations to efficiently share audio content, ranging from generic programmes to relevant news and diverse entertainment, and to benefit from content produced by other stations or radio hosts. All content is validated in terms of technical and substantive quality. Additionally, the platform incorporates a course developed for local radio professionals, covering various topics from audio editing to digital marketing and the use of Artificial Intelligence. This article aims to present the development process of the NEWAVES platform and the rationale behind the chosen options, based on different analyses of the reality of local radio stations, which allowed for the identification of their needs. Finally, the article addresses the technical challenges and innovation opportunities associated with the development of the NEWAVES platform. The integration of streaming technologies, data security, and interoperability are some of the technical issues the project is tackling. The platform represents a significant advancement in how technology can serve specific communities, adapting to their unique characteristics and promoting digital inclusion. The next steps in the project will involve validating the platform with local radio professionals.

Keywords: NEWAVES, Local Radios, Digital innovation, Low density territories.

Introduction

Local radio stations in low-density territories contribute to the promotion of social cohesion, the preservation of cultural identity, and fostering community dialogue. These stations provide information in regions where large media networks are often absent, offering their audiences local news and culturally relevant content

(Howley, 2010; Verza et al., 2024). They also serve as cultural agents and platforms for civic engagement. However, the sustainability of local radio stations faces challenges in the context of a changing digital media environment (Napoli, 2011).

The shift to digital media has amplified the structural vulnerabilities of local radio stations. The use of digital platforms, streaming services, and social networks has led to changes in audience behaviour and disrupted traditional advertising models, creating pressure on small broadcasters. Financial limitations, limited access to advanced technologies, and a shortage of qualified professionals reduce their capacity to compete in a digitalised environment. These factors have contributed to a decline in audience engagement and revenue streams for local broadcasters, particularly in regions with constrained economic activity (Midões, 2021).

To support these institutions, the European Union co-funded the NEWAVES project through its Creative Europe program. The project addresses the needs of local radio stations in Europe through a collaboration between higher education institutions and local broadcasters in Portugal, Croatia, Slovakia, and North Macedonia (European Commission, 2023). The project aims to integrate technological innovation with capacity-building methodologies to strengthen these local media stations. One of its objectives is to establish a digital platform that facilitates collaboration and resource sharing among local radio stations. This platform enables the exchange of audio content, including news and entertainment, validated by technical and content standards. By fostering collaboration among broadcasters, the platform reduces resource duplication, improves operational efficiency, and increases the reach of local content (NEWAVES, 2024). The NEWAVES project includes a focus on human resource development. A training program has been developed to address skills gaps among professionals in areas such as audio editing, content marketing, and audience analysis. The program allows participants to focus on topics aligned with their professional needs. The project also includes a mobility program that facilitates learning through cooperation and the exchange of practices (NEWAVES, 2024). Reinforcing principles and accessibility in media innovation is the main goal of the NEWAVES project. By tackling the challenges faced by local broadcasters in less populated areas, it seeks to promote digital equity and ensure these stations remain connected to their communities. This aligns with the European Union priorities of fostering media diversity, supporting local economies and communities, and enhancing cultural cohesion in specific regions (Sasse, 2023). The project offers a framework of digital tools, training, and collaboration opportunities to support local radio in Europe.

In the light of the digital transformation, it is necessary to reconsider the role of local radio stations to address the changing needs of audiences (Hallet & Hintz, 2010; Kemppainen, 2012). By providing broadcasters with tools, skills, and networks to adapt to this transition, NEWAVES seeks to maintain their contributions to society while supporting their integration into the media landscape. This research examines the objectives and methods of the project, focusing on its approach to the future of local radio in low-density territories. By evaluating the effects of these elements on audience engagement and community participation, the study provides strategies for sustaining local media stations.

Challenges of local radios in Europe

Local radio stations hold a role within the European media ecosystem, particularly in rural, sparsely populated areas where national broadcasters face challenges in maintaining their relevance (Timalsina & Pradhan, 2019; Maye et al., 2020). These stations act as the primary media, disseminating hyperlocal

content that addresses the specific needs, cultural characteristics, and challenges of their communities. Unlike national media stations, local radios focus on the immediate concerns of their audiences, sharing information on local news, cultural events, and community affairs. By offering a platform for local voices, these stations contribute to community identity and support the preservation of regional heritage in a globalised context (Evens & Paulussen, 2012; Glumber, 2021).

Therefore, local radio stations contribute to social cohesion (Frases & Restrepo-Estrada, 2002). They act as a channel between different groups within a community, enabling dialogue and promoting mutual understanding. In Europe's multilingual and culturally diverse regions, local radio stations play a role in promoting linguistic diversity by broadcasting in regional languages (Carpentier, Lie, & Servaes, 2008; Brogi et al., 2016). This helps preserve cultural heritage and ensures that communities remain engaged in public discourse. Local radio stations also provide critical, real-time information to their audiences. In rural regions, where access to digital infrastructure is limited, local radio stations often serve as the main source of information, ensuring that even isolated communities stay informed (Nettlefold, 2019).

Local radio stations in Europe face challenges in ensuring their long-term sustainability. These challenges arise from financial, technological, regulatory, and competitive factors that affect their ability to operate efficiently (Humphreys, 2006). The growth of digital advertising platforms such as Google and Facebook has redirected advertising revenues from traditional broadcasters, reducing the funding available to local stations. Limited access to capital or targeted financial resources for small broadcasters further increases the situation. Financial centralisation in European countries often directs resources toward larger urban areas, reducing support for rural or community stations (Klagge & Martin, 2005). Additionally, restricted public funding limits these stations' capacity to invest in infrastructure or adapt to current operational needs (Hallet & Hintz). These challenges are amplified by evolving audience behaviors and a fragmented digital media ecosystem (Napoli, 2019).

Added to that, radio stations are operated with a minimal workforce, where individuals have to assume multiple roles, including technical operations, content creation and advertising (Sadat & Alhassan, 2013). The necessity for personnel in such roles to multitask can result in burnout and a subsequent reduction in the quality of the programming. Furthermore, restricted access to professional development programs hinders the acquisition of skills in areas such as digital marketing, podcast production, and audience engagement, which allows media local stations to adapt to new trends (Crider, 2022). Moreover, the proliferation of social media platforms and streaming services has altered audience behaviours (He et al., 2022). This necessitates challenging local radio stations to survive in an increasingly crowded and fragmented media landscape. The challenge of retaining audience loyalty while competing with global platforms such as Spotify and Youtube is notable, given that these platforms offer personalised content that traditional radio cannot replicate (Chan-Olmsted et al., 2020; McMahon, 2021).

The digital transition also represents a challenge. While digital platforms offer opportunities to expand reach and diversify content, they also require financial and technological investments. Many local radio stations, especially in economically disadvantaged regions, had a lack of resources to modernise their infrastructure or train their professionals to use new technologies (Maye et al., 2020).

Digital innovation through NEWAVES initiative

The media sector is facing challenges in sparsely populated European regions. The NEWAVES project aims to be one of the solutions to these issues. The project was developed in response to the Creative Europe Programme, the CREA-CROSS-2022-JOURPART-101112458 call, which was designed to support initiatives that enhance the sustainability of journalism and foster innovative collaboration across European regions (Noni et al., 2018; European Commission, 2023). The transition to digital media made it easier to provide news in a variety of formats, which boosted market competition, particularly in the local radio industry, which has seen a significant reduction in listeners and advertising revenue (Kerrigan & Graham, 2010; Papathanassopoulos, 2023). By giving local radio stations throughout Europe the chance to join a supportive network, NEWAVES develops a cross-border and cross-sectorial community that will work in collaboration with other professionals and have access to several tools and resources, including a digital platform for the distribution of radio programming across a variety of genres (Perkmann, 2003; Edmond, 2015). The platform will provide the material produced by each of these local radio stations, giving them access and promoting the circulation of a broad variety of European "glocal" content, enhancing what these radios can offer to their listeners, and boosting their competitiveness (Coleman, 2021). NEWAVES enhances high-quality and reliable radio journalism by employing a validation approach for materials on the platform according to rigorous technical and content quality standards.

To achieve these objectives, the NEWAVES project is supported by a consortium of partners from different European regions. The project brings together seven partners, including higher education institutions and local radio stations from Portugal, North Macedonia, Slovakia and Croatia. Among the partners are the Guarda Polytechnic University (IPG), Rádio Altitude, Alexander Dubček University Of Trenčín (TNUAD), Radio Kanal 77, Radio and Television of Slovakia (RTS), Golce Delchev University (UGD), The Academy of Arts and Culture, and Croatian Radio Osijek (UAOS-UNIOS), which represent local broadcasting institutions and academic expertise (NEWAVES, 2024). These organisations play complementary roles in the development of the project, with each partner contributing to the co-creation of the digital platform and training programs. It is believed that transnational collaboration fosters innovation by sharing diverse regional perspectives and resources (Bajomi-Lázár, 2013; Dong et al., 2018). Despite that, transnational collaboration ensures that the project addresses the challenges faced by local radio stations in low-density territories while promoting innovation and sustainability in the European radio ecosystem. By combining resources, expertise, and regional perspectives, the consortium reinforces NEWAVES' mission to revitalise local media and increase its social impact (Agouri, 2023; Marques & Graf, 2024). Therefore, NEWAVES is a network for the exchange of the best practices between local radios, journalists, and communication professionals from higher education institutions to increase viability, innovation, and creativity in production and dissemination. The project will implement a knowledge transfer centre for the radio sector at the local level for the acquisition and improvement of professional skills of journalists and media professionals (Reyes-De-Cózar, 2022; Dragomir, 2024). In order to do this, NEWAVES plans to educate current and future communication professionals and students through physical and online mobility programs and e-learning courses to meet the specific needs of local radio stations. These courses will be developed through a collaborative process of co-creation work packages (WPs).

The NEWAVES project is structured into four interconnected WPs, each designed to address a specific aspect of the initiative. The deliverables of each WP are clearly defined in order to ensure the successful implementation of the project. WP1, which covers the management and coordination of the project, is the responsibility of IPG. The deliverables include management and financial tools, monitoring and quality control plans, and an interim management report, which are designed to oversee the project's progress and maintain operational efficiency throughout its duration. The WP2, led by UGD, is dedicated to the development of the digital platform. This idea emerged because collaborative platforms provide a means for local radios to leverage shared resources effectively, creating mutual value and sustaining operations (Mogensen, 2014; Leipämaa-Leskinen, 2022). This WP includes a report on best practices and pivotal requirements, the development of a digital platform tailored to the radio sector, outcomes from platform prototyping trials, a validation protocol to guarantee content quality, and a repository for storing and sharing digital content (Zao et al., 2016; Kulmukhametov, 2021). These deliverables constitute the basis for the project's technological innovation. TNUAD is responsible for the WP3, which is concerned with the training and capacity building of personnel in the media sector, something that is essential for equipping media professionals to adapt to the changing media landscape (Deuze, 2005; Severijnen & Haan, 2024). The deliverables of this WP are related to a training report, an introductory e-learning course program, and a set of recommendations derived from prototyping tests. Furthermore, this WP incorporates a mobility program, the objective of which is to enhance the professional skills of media professionals and students, addressing the specific needs of local radio stations (Bonxie, 2015; Kischinhevsky et al., 2022). UAOS-UNIOS is the leader of WP4, which includes dissemination and follow-up activities. The deliverables are related to the formulation of a communication and dissemination strategy. The main outputs include the formulation of a communication and dissemination strategy, the establishment of a project website and an active social media presence, the production of a promotional toolkit, and the production of a dissemination monitoring report (Martins et al., 2023; Wenzel, 2023). These outputs serve to increase the visibility of the project and facilitate the dissemination of its results.

Artificial Intelligence in combating disinformation

The dissemination of disinformation represents a challenge to the credibility of media, the level of trust placed in them by the public, and the cohesion of communities covered by local broadcasters (Vosoughi et al., 2018). In order to effectively address this challenge, adopt strategies such as the utilisation of artificial intelligence (AI) technologies, as they have the potential to enhance the informational role of local radio stations in low-density territories (Brennen et al., 2020; Helberger et al., 2020). For these stations, which operate with limited human resources, AI can automate key aspects of content verification (Graves, 2018; Vosoughi et al., 2018). Consequently, AI tools can cross-reference statements in news with verified databases to assess their accuracy (Shu et al., 2020). This capability makes it possible to deal with disinformation during situations like emergencies, elections or health crises, where local radio has a role in informing communities.

Fact-checking is a method of combating disinformation, and AI systems provide instruments to enhance this process (Ashari et al., 2024; Bartol & Tommasel, 2024; Gautman, 2024). Utilising AI tools facilitates the assessment of claims, the identification of anomalies, and the highlighting of inconsistencies (Hartley, 2024).

The integration of these tools not only ensures that the content disseminated corresponds to quality and reliability standards but also simplifies the work of media professionals.

Deepfake detection is another area where AI is helping to combat disinformation (Rana et al, 2020; Garriga et al., 2024). Deepfakes, which use AI to create manipulated audio or visual content, have become increasingly sophisticated and are used to spread false narratives (Paris & Donovan, 2019). AI models trained to identify subtle irregularities in videos or audio can alert local radio stations to potential threats, allowing them to act proactively in their reporting (Kaur et al., 2024). AI tools can enhance decision-making processes in the media sector (Chan-Olmsted, 2019; Gonçalves, et al., 2024). By categorising content, identifying trends in audience engagement, and detecting false information, AI can provide local radio stations with insights that empower local radio stations (Kietzmann et al., 2020). This ability is valuable in low-density territories, where stations lack specialised staff to carry out these tasks. AI can help stations adapt their programming to align with audience preferences while maintaining ethical and professional standards (Helberger et al., 2020). The use of AI in content classification can also assist in maintaining the quality of information disseminated (Bahad et al, 2019; Gondwe, 2023). AI tools that evaluate the readability of news enhance content quality protocols (L'Opdahl et al, 2023; Santos, 2023). These systems can automatically recommend adjustments to ensure clarity and neutrality, improving the integrity of the broadcaster's content. AI systems can also monitor social media platforms for the spread of misinformation that targets specific communities (Aïmeur et al., 2023; Saheb et al., 2024; Shu et al, 2017). This capability would enable local radio stations to effectively combat negative narratives by disseminating accurate facts to combat disinformation. In this way, AI reinforces the function of local radio as a reliable information source in underpopulated areas.

Even though AI has potential, it also has some problems (Dwived et al., 2019; Borges et al., 2020). Biased data sets can cause mistakes in classifying content, like calling true stories false or not paying attention to forms of disinformation, which can disintegrate audience trust (Bakir & McStay, 2018) A further challenge is the necessity for human supervision (Duan et al., 2019; Cañas, 2022). Although AI has the potential to automate numerous aspects of disinformation detection, there are instances where a contextual understanding is necessary, which AI is currently unable to provide (Dorotic et al., 2024). The use of regional dialects in local radio content can result in misinterpretation by AI systems, necessitating manual review by station staff (Graves, 2018). Furthermore, local radio stations have financial and technical barriers to adopting AI solutions. The cost of implementing and maintaining AI technologies can impact these stations' already constrained budgets.

Additionally, adopting AI that allows for feedback could make content validation systems more accurate and useful. The audience can help improve AI algorithms by reporting instances of what they think is false information. This will help the algorithms adapt to the changing strategies used by disinformation campaigns (Shu et al., 2020). Consequently, the implementation of AI presents a substantial opportunity to enhance the ability of local radio stations to combat disinformation.

AI will provide clear opportunities to combat disinformation. In this sense, the NEWAVES platform is exploring AI-based mechanisms to support content validation, content tagging, and source reliability in order to enable radio stations to upload and download reliable content. This is especially useful for stations with limited staff and resources. This core feature of the NEWAVES platform is highlighted in the validation protocol that establishes a combination of AI and human oversight. AI checks technical specifications (such

as audio quality and formats) and content coherence based on references and sources. Then, designated professionals perform a final human validation of the content. This protocol aims to integrate AI as an overall tool for providing the reliable and numerous pieces of content that are the main goal of the project. The incorporation of AI tools facilitates the use of technology in the fight against disinformation in the media sector. In this context, the following hypotheses are put forth for consideration in this paper:

H1: The implementation of the NEWAVES project increases collaboration among local radio stations in low-density territories.

H2: The adoption of the NEWAVES digital platform will allow local radio stations to have access to validated content, supporting a more efficient use of resources in content production.

H3: The dissemination strategies implemented within the NEWAVES project, including multi-channel digital campaigns and public events, increase engagement metrics and participation in project-related activities.

Methodology

The methodology follows a mixed-methods approach, integrating qualitative and quantitative data collection and analysis to examine the challenges faced by local radio stations in low-density territories. This approach aimed to provide a structured understanding of the operational context and facilitate the development of practical digital solutions. The first phase involved an analysis of the context, focusing on the operational, financial, and technical conditions of local radio stations. This phase included the review of documents to identify key limitations, such as financial constraints and technological gaps. The next phase addressed the development of the NEWAVES digital platform. Workshops were conducted with professionals from local radio stations and academic partners from Portugal, North Macedonia, Slovakia, and Croatia. These workshops collected input on user requirements, prioritised functionalities, and guided the design of the platform. Prototyping and testing sessions were conducted to align the platform with identified needs. To address professional training needs, the project created a training program that included e-learning modules and mobility sessions. These were designed to enhance skills in areas such as digital marketing, audio editing, and audience engagement. Feedback from participants was collected to improve the program structure and content. A pilot test was conducted with local radio professionals to assess the platform's usability and relevance, using both quantitative and qualitative data collected through a questionnaire administered via Google Forms. Dissemination activities were integrated into the methodology to extend the project's reach. Channels such as social media, institutional websites, and events were used to share project objectives and outputs. Engagement metrics and participation data were collected to evaluate the dissemination strategy.

The methodology incorporated a monitoring and evaluation framework to assess project outcomes. Key performance indicators were defined to measure the use of the platform, participation in training, and audience engagement. These indicators guided the evaluation of the project's implementation and results, documented in detailed reports. This methodology ensured structured execution and alignment with research and practical objectives.

Results

Collaboration and resource sharing

The NEWAVES digital platform intends to facilitate collaboration between local radio stations in Portugal, North Macedonia, Slovakia, and Croatia, addressing challenges related to resource fragmentation and content quality. The platform will allow participating stations to upload and access validated audio content, such as news, interviews, and entertainment programs. A key feature of the platform is its validation protocol, ensuring technical and informational quality of uploaded content, which reduced redundancies and improved operational efficiency (J. Gonçalves et al., 2024a; J. Gonçalves et al., 2024b). In Croatia, 90% of surveyed radio stations expressed interest in participating in the platform for content exchange, provided the costs were manageable. This level of engagement reflected the perceived value of shared resources in strengthening programming and audience retention (J. Gonçalves et al., 2024b; J. Gonçalves et al., 2024c). The repository structure included metadata fields for categorising and tagging content, such as topics, formats, and geographical scope, making it easier for stations to find relevant material. Reports from consortium countries confirmed the platform's role in improving access to diverse and high-quality content, although detailed metrics on time saved or audience growth were not quantified during the pilot phase (J. Gonçalves et al., 2024a; J. Gonçalves et al., 2024c). In addition, voice content is also converted into text, translated into English and into the languages of the project's partners. They are then fact-checked, initially using AI and then validated by a human. Regarding user interaction with the platform (H. Engracio et al, 2024) , results indicate that local radio professionals rated its overall quality at 4.2 out of 5. Respondents gave particularly high scores for the variety and relevance of the content—averaging 4.5 out of 5—demonstrating both general satisfaction and NEWAVES' strong potential to meet the specific needs of this audience. The overall user experience was also highly rated, with an exceptionally high likelihood of users recommending the platform (4.6 out of 5). Notably, all respondents expressed their intention to continue using the platform implying that this project can have a positive impact in this specific media reality.

Skill development through training programmes

The NEWAVES training initiatives aim to address gaps in technical and skills for management among local radio professionals. The training program, delivered through an e-learning platform, will include four modules: digital skills, ethics and law in journalism, marketing and communication, and media entrepreneurship. The modules were designed collaboratively with input from academic and media partners to ensure relevance to participants' needs (J. Gonçalves et al., 2024b; J. Gonçalves et al., 2024c). The e-learning platform will offer a total of 32 hours of training, with additional resources such as case studies, quizzes, and recommended literature to support self-study. In addition to English, the participants from Portugal, North Macedonia, Slovakia, and Croatia will access the content in their local languages, which will increase accessibility and membership. Feedback from participants during the pilot phase highlighted improvements in their capacity to use digital tools and implement audience engagement strategies. For example, a significant proportion of participants noted that the training enabled them to incorporate

podcasting and social media analytics into their operations (J. Gonçalves et al., 2024b; J. Gonçalves et al., 2024c).

Impact on operational sustainability

Stations participating in the NEWAVES project will benefit from reduced content production costs due to the availability of validated shared resources. Additionally, the incorporation of marketing strategies from training modules enabled stations, such as those in North Macedonia, to secure additional sponsorships, aligning with project goals for economic resilience (F. Gonçalves et al., 2024; J. Gonçalves et al., 2024b). Over 70% of the operating budgets of some stations were allocated to salaries, restricting investments in new technologies or professional development. Future phases of the project should focus on mitigating these barriers by exploring additional funding mechanisms and expanding the technical capabilities of the platform (F. Gonçalves et al., 2024; J. Gonçalves et al., 2024b).

Dissemination and audience engagement

Dissemination efforts under WP4 included a multi-channel approach with digital platforms such as Facebook, Instagram, and LinkedIn, achieving a cumulative performance of 55,000 impressions and a 6.3% interaction rate on Facebook (F. Gonçalves et al., 2024). The NEWAVES Instagram profile reached 485 users organically, demonstrating its utility in engaging younger audiences (F. Gonçalves et al., 2024). Moreover, the consortium organised 14 events across partner countries, including scientific conferences and public seminars, which engaged over 400 participants. These events contributed to heightened awareness of the NEWAVES objectives and fostered partnerships with academic and professional communities (F. Gonçalves et al., 2024).

Discussion

The results support H1, which states that the implementation of the NEWAVES would increase collaboration among local radio stations. The development of a shared repository of validated content facilitated a systematic exchange of resources, reducing redundancies and improving content quality. Collaborative frameworks in local media strengthen resource allocation and operational efficiency (Evens & Paulussen, 2012). Furthermore, cross-border collaboration fosters innovation and adaptability, which was evident in the reported engagement of consortium partners (Dong et al., 2018). The structured metadata within the repository also reflects best practices (Mogensen, 2014), where categorisation enhances content accessibility and supports operational workflows.

The hypothesis that the NEWAVES digital platform would improve resource efficiency in content production by providing access to validated content (H2) was also confirmed. By accessing pre-validated content, the local radio stations were able to reduce production costs associated with creating original material (Coleman, 2021), which is significant for smaller stations operating with limited budgets (Perkmann, 2003). Additionally, stations were able to reallocate resources to other areas of operational development, including marketing or audience analysis, by using a repository of audio content. Although the long-term impact of this efficiency

on financial sustainability requires further research, particularly concerning scalability and adaptability in an operational context.

The findings also support H3, demonstrating that dissemination strategies employed within the NEWAVES project increased engagement and participation in project-related activities. Digital campaigns across platforms, such as Facebook, Instagram, and LinkedIn, achieved substantial impressions and interaction rates, while public events engaged a wide range of stakeholders, including academic and media professionals. Multi-channel dissemination demonstrates the potential of digital media to reach a wide range of audiences. Furthermore, public events organised across the partner countries engaged over 400 participants, including academic institutions, media professionals, and local communities. These events served as platforms for networking and collaboration among stakeholders. A practice evident in this project's approach is leveraging digital tools to enhance audience participation (Edmon, 2015).

The integration of AI tools into the NEWAVES platform introduced opportunities for combating disinformation and enhancing operational workflows. Tools such as content validation and deepfake detection, demonstrated potential to support local radio stations in maintaining credibility and audience trust (Vosoughi et al., 2018). Nonetheless, challenges such as algorithmic bias, financial limitations, and the need for human oversight remain key considerations (Duan et al, 2019). These findings underscore the need for a balanced approach that combines technological innovation with professional oversight, particularly in regions with diverse linguistic and cultural characteristics.

Conclusions

The NEWAVES project demonstrates the potential of digital innovation to address the challenges faced by local radio stations in low-density territories. By fostering collaboration and resource-sharing through a dedicated digital platform, the project enhanced the operational efficiency of participating stations, reducing redundancies and improving the quality and diversity of content. This initiative underscores the value of transnational cooperation in revitalizing local media and increasing their societal impact.

Integrating AI tools into the NEWAVES platform highlighted new possibilities for combating disinformation and enhancing operational workflows. AI applications, such as content validation and deepfake detection, demonstrated significant potential in improving the credibility and reliability of local radio content. However, their implementation also brought attention to ethical and technical considerations, underscoring the need for balanced integration that leverages both technological advancements and human expertise.

Furthermore, the project promotes cultural diversity and digital inclusion by enabling the circulation of "glocal" content across borders. This approach strengthened the preservation of regional identities and cultural heritage, while connecting local stations to a broader media ecosystem. In doing so, the NEWAVES platform established a model for enhancing the role of community media in fostering cultural cohesion and supporting local economies.

Conversely, according to media partners, the training program developed within the project effectively addressed key skills gaps, equipping media professionals with competencies in areas such as digital marketing, audience engagement, and audio editing. The use of e-learning modules and mobility opportunities enable participants to adapt to the evolving demands of the digital media landscape while

maintaining a focus on accessibility through multilingual resources. These training efforts not only improve professional capacity but also strengthen the resilience of local stations in a competitive environment.

Overall, the NEWAVES project exemplifies how a combination of digital tools, capacity-building initiatives, and collaborative frameworks has the potential to transform the sustainability and relevance of local media in a rapidly evolving digital landscape. Preliminar results show that the platform is being well received by local radio professionals rating it highly in pilot testing when referring to overall experience, relevance, quality of content and future use. . Despite these achievements, the project also underscores ongoing challenges, including financial constraints, limited technological infrastructure, and the need for sustained support. Also challenging can be the adaptation to a new paradigm from the local radio stations professionals who in many cases are few and familiarised with the new technologies as a consequence of limited investments in infrastructure along the time. Despite the benefits of cross-border collaboration, the project also encountered variations in national media regulations and local content practices that required adaptive strategies to ensure inclusivity and interoperability. The success of similar initiatives will depend on continued investment in these areas and the development of policies that support local media. Furthermore, the integration of AI tools requires a balanced approach that addresses technological, financial, and ethical considerations.

Regarding NEWAVES project future steps, it's aimed to scale the platform's impact by integrating advanced technologies, such as AI and analytics, to enhance content validation and audience engagement while developing innovative funding models to ensure financial sustainability for local radio stations, specially the ones located in low density territories. Training initiatives will continue to be explored, focusing on equipping professionals with skills in emerging trends like podcasting. Additionally, the broader sociocultural effects of NEWAVES, including its influence on community identity and digital inclusion, will be examined through comparative studies to assess the scalability and adaptability of the model across regions.

.

Bibliographical references

Aïmeur, E., Amri, S., & Brassard, G. (2023). Fake news, disinformation and misinformation in social media: a review. *Social Network Analysis and Mining*, 13, 2-36. https://doi.org/10.1007/s13278-023-01028-5

Agouri, J. (2023). *Transnational collaboration and mobility in higher education: looking back and looking forward*. The Guild of European Research-Intensive Universities and Bern Open Publishing.

Ashari, C. A., Apriani, F., Jariyah, A., Amelia, F. R., Suraj, S. R., & Zein, H. (2024). Fact-checking in the age of misinformation: Linguistic strategies for accurate reporting. *PRIMACY: Journal of English Education and Literacy*, 3(1), 28-36. https://doi.org/10.33592/primacy.v3i1.4194

Bahad, P., Saxena, P., & Kamal, R. (2019). Fake news detection using bi-directional LSTM-recurrent neural network. *Procedia Computer Science*, *165*, 74-82. https://doi.org/10.1016/j.procs.2020.01.072

Bajomi-Lázár, P. (2013). The Party Colonisation of the Media: The Case of Hungary. *East European Politics and Societies*, 27(1), 69-89. https://doi.org/10.1177/0888325412465085

Bakir, V., & McStay, A. (2017). Fake News and The Economy of Emotions: Problems, causes, solutions. *Digital Journalism*, 6(2), 154–175. https://doi.org/10.1080/21670811.2017.1345645

Bartol, G., Tommasel, A. (2024). Towards Automated Fact-Checking: An Exploratory Study on Identifying Check-Worthy Phrases for Verification. *2024 L Latin American Computer Conference (CLEI)*, Argentina (pp.1.10). https://doi.org/10.1109/clei64178.2024.10700241

Bonxie, L. (2015). A territorialização da informação: Uma análise do jornalismo nas rádios locais portuguesas. *Revista Novos Olhares*, 4(1), 67-80. https://doi.org/10.11606/issn.2238-7714.no.2015.102239

Borges, A., Laurindo, F., Spínola, M., Gonçalves, R., & Mattos, C. (2020). The strategic use of artificial intelligence in the digital era: Systematic literature review and future research directions. *International Journal of Information Management*, 57(17), 102-225. https://doi.org/10.1016/J.IJINFOMGT.2020.102225.

Brennen, J. S., Simon, F. M., & Nielsen, R. K. (2020). Beyond (mis)information: Understanding the role of digital media in misinformation and disinformation. *Information, Communication & Society*, 23(4), 551-565. https://doi.org/10.1080/1369118X.2020.1761851

Brogi, E., Ejik, N., Fathaigh, R., Furnémont, J., Gerber, O., Lacino, G., Janssen, M., Kevin, D., McGonagle, T., Ostling, A., Pellicanó, F., Selier, B., & Valais, S. (2016). *Regional and local broadcasting in Europe*. European Audiovisual Observatory.

Cañas, J. (2022). AI and Ethics When Human Beings Collaborate With AI Agents. *Frontiers in Psychology,* 13, 1-9. https://doi.org/10.3389/fpshttps://doi.org/10.3389/fpsyg.2022.836650yg.2022.836650.

Carpentier, N., Lie, R., & Servaes, J. (2008). Making community media work: Community media identities and their articulations in the case of community radio in Bolivia. In J. Servaes (Ed.), *Approaches to development: studies on communication for development* (pp. 241-262). Springer. https://lc.cx/8lmeO6

Chan-Olmsted, S. (2019). A review of artificial intelligence adoptions in the media industry. *International journal on media management*, *21*(3-4), 193-215. https://doi.org/10.1080/14241277.2019.1695619

Chan-Olmsted, S., Wang, R., & Hwang, K. (2020). Substitutability and complementarity of broadcast radio and music streaming services: The millennial perspective. *Mobile Media & Communication*, 8(2), 209-228. https://doi.org/10.1177/2050157919856647

Coleman, J. (2021). *Digital Innovations and the Production of Local Content in Community Radio*. Routledge. https://doi.org/10.4324/9781003050865

Crider, D. (2022). A public sphere, on-demand: an assessment of local podcasting. *Popular Communication,* 21(1), 43-56. https://doi.org/10.1080/15405702.2022.2028157

Deuze, M. (2005). What is journalism? Professional identity and ideology of journalists reconsidered. *Journalism*, 6(4), 442-464. https://doi.org/10.1177/1464884905056815

Dragomir, M. (2024). Knowledge Transfer: From Corporations to the Media and from the Media to Society. In J. Sixto-García, A. Quian, Al. Rodríguez-Vázquez, A. Silva-Rodríguez, & X. Soengas-Pérez (Eds.), *Journalism, Digital Media and the Fourth Industrial Revolution* (pp. 197-209). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-63153-5_15

Dorotic, M., Stagno, E., & Warlop, L. (2024). AI on the street: Context-dependent responses to artificial intelligence. *International Journal of Research in Marketing*, 41(1), 113-137. https://doi.org/10.1016/j.ijresmar.2023.08.010

Dong, Y., Ma, H., Tang, J., & Wang, K. (2018). Collaboration diversity and scientific impact. *Journal of Informetrics*, 12(3), 809–825. https://doi.org/10.48550/arXiv.1806.03694

Duan, Y., Edwards, J., & Dwivedi, Y. (2019). Artificial intelligence for decision-making in the era of big data-evolution, challenges and research agenda. *International Journal of Information Management,* 48, 63-71. https://doi.org/10.1016/J.IJINFOMGT.2019.01.021

Dwivedi, Y., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P., Janssen, M., Jones, P., Kar, A., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., Medaglia, R., Meunier-FitzHugh, K., Meunier-FitzHugh, L., Misra, S., Mogaji, E., Sharma, S., Singh, J., Raghavan, V., Raman, R., Rana, N., Samothrakis, S., Spencer, J., Tamilmani, K., Tubadji, A., Walton, P., & Williams, M. (2019). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57, 109-994. https://doi.org/10.1016/J.IJINFOMGT.2019.08.002

Edmond, M. (2015). All platforms considered: Contemporary radio and transmedia engagement. *New Media & Society,* 17(9), 1566–1582. https://doi.org/10.1177/1461444814530245

Engrácio, H., Gonçalves, F., Gonçalves, J., Moreira, F., Caetano, F. , Costa, S. , Martins, L.,Correia, P. , Zlatovski. V., Naskova, L. , Galeva, J., Stojanovski, S., Stojanov, I., Mihailov, T., Kolovska, V., Blazhevska, S., Struhar, P., Liptáková, P., Riavová, D., Krajčovič, P., Baric-Selmic, S., Đukić, M., Levak, T., Lončarić, D. (2024) *Grid with the Digital Platform prototyping tests results (and recommendations)*, NEWAVES - Collaborative Alliance for Radio Recovery and Boost of Community News Media in Low-density Territories.

European Commission. (2023, July 24). *Second set of EU-supported Journalism Partnerships to help wider news sector. NEWAVES.* European Commission. https://lc.cx/lavjLZ

Evens, T., & Paulussen, S. (2012). Local radio in Europe: Policy options for a sustainable sector. *Media, Culture & Society*, 34(1), 112-121. https://doi.org/10.1177/0163443711429241

Fraser, C., Restrepo-Estrada, S. (2002). Community Radio for Change and Development. *Development,* 45(4), 69–73. https://doi.org/10.1057/palgrave.development.1110408

Garriga, M., Ruiz-Incertis, R., & Magallón-Rosa, R. (2024). Artificial intelligence, disinformation and media literacy proposals around deepfakes. *Observatório (OBS*)*, 18(5), 175-195. https://doi.org/10.15847/obsOBS18520242445

Gautam, S. (2024). FactGenius: Combining Zero-Shot Prompting and Fuzzy Relation Mining to Improve Fact Verification with Knowledge Graphs. *arXiv*. https://doi.org/10.48550/arXiv.2406.01311

Gonçalves, A., Pinto, D., Shuqair, S., Dalmoro, M., & Mattila, A. (2024). Artificial intelligence vs. autonomous decision-making in streaming platforms: A mixed-method approach. *International Journal of Information Management*, 76(1-2), 102-748. https://doi.org/10.1016/j.ijinfomgt.2023.102748

Gonçalves, F., Gonçalves, J., Silva, B., Saraiva, M., Batista, L., Zlatkovski, V., Naskova, L., Kolovska, V., Blazhevska, S., Liptáková, P., Struhar, P., Riavová, D., Krajčovič, P., Baric-Selmic, S., Đukić, M., & Levak, T. (2024). *Communication and Dissemination Monitoring Report*. NEWAVES - Collaborative Alliance for Radio Recovery and Boost of Community News Media in Low-density Territories.

Gonçalves, J., Moreira, F., Engrácio, H., Zlatkovski, V., Naskova, L., Galeva, J., Stojanovski, S., Stojanov, I., Mihailov, T., Kolovska, V., Blazhevska, S., Struhar, P., Liptáková, P. Riavová, D., Krajčovič, P., Baric-Selmic, S., Đukić, M., Levak, T., & Lončarić, D. (2024a). *Validation Protocol*. NEWAVES - Collaborative Alliance for Radio Recovery and Boost of Community News Media in Low-density Territories.

Gonçalves, J., Moreira, F., Gonçalves, F., Galeva, J., Stojanovski, S., Pacheshkoski, V., Arsova, M., Davchev, L., Zlatkovski, V., Naskova, L., Struhár, P., Liptáková, P., Drobný, M., Hanulík, T., Đukić, M., & Levak, T. (2024b). *Training Report for the Media Sector*. NEWAVES - Collaborative Alliance for Radio Recovery and Boost of Community News Media in Low-density Territories.

Gonçalves, J., Moreira, F., Gonçalves, F., Galeva, J., Stojanovski, S., Pacheshkoski, V., Arsova, M., Davchev, L., Zlatkovski, V., Naskova, L., Đukić, M., Levak, T., Struhár, P., Liptáková, P., Drobný, M., & Hanulík, T. (2024). *Introductory Elearning Course Programme*. NEWAVES - Collaborative Alliance for Radio Recovery and Boost of Community News Media in Low-density Territories.

Gondwe, G. (2023). Mapping AI Arguments in Journalism Studies. *arXiv.* https://doi.org/10.48550/arXiv.2309.12357

Graves, L. (2018). Understanding the promise and limits of automated fact-checking. *Reuters Institute for the Study of Journalism.* http://dx.doi.org/10.60625/risj-nqnx-bg89

Gumber, P. (2021). Role Of Community Radios In Rural Development: A Quantitative Investigation. *Elementary Education Online*, 20(6), 5038-5045. https://ilkogretim-online.org/index.php/pub/article/view/4141/4026

Hallett, L., & Hintz, A. (2010). Digital broadcasting: Challenges and opportunities for European community radio broadcasters. *Telematics and Informatics*, 27(2), 151–161. https://doi.org/10.1016/j.tele.2009.06.005

Hartley, R. (2024). Efficacy Analysis of Online Artificial Intelligence Fact-Checking Tools. *The International Review of Information Ethics*, *33*(1), 1-14. https://doi.org/10.29173/irie502

He, D., Yao, Z., Tang, P., & Y. (2022). Impacts of different interactions on viewers' sense of virtual community: an empirical study of live streaming platforms. *Behaviour & Information Technology*, 42(7), 940-960. https://doi.org/10.1080/0144929X.2022.2053884

Helberger, N., Karppinen, K., & D'Acunto, L. (2020). Exposure diversity as a design principle for recommender systems. *Information, Communication & Society*, 21(2), 191-07. https://doi.org/10.1080/1369118X.2016.1271900

Howley, K. (2010). *Understanding community media*. SAGE Publications.

Humphreys, P. (2006). Globalization, Regulatory Competition, and EU Policy Transfer in the Telecoms and Broadcasting Sectors. *International Journal of Public Administration*, 29(4-6), 305-334. https://doi.org/10.1080/01900690500437055

Kaur, A., Hoshyar, A., Saikrishna, V., Firmin, S., & Xia, F. (2024). Deepfake video detection: challenges and opportunities. *Artificial Intelligence Review*, 57(159), 1-47. https://doi.org/10.1007/s10462-024-10810-6

Kemppainen, P. (2012). The role of public service in digitisation of radio. *Journal of Media Business Studies*, 9(1), 71-83. https://doi.org/10.1080/16522354.2012.11073537

Kerrigan, F., & Graham, G. (2010). Interaction of regional news-media production and consumption through the social space. *Journal of Marketing Management*, 26(3-4), 302-320. https://doi.org/10.1080/02672570903566334

Kietzmann, J., Lee, L., McCarthy, I., & Kietzmann, T. (2020). Deepfakes: Trick or treat? *Business Horizons*, 63(2), 135–146. https://doi.org/10.1016/j.bushor.2019.11.006

Kischinhevsky, M., Lopez, D. C., Mustafá, I., Freire, M., Consciente, P., & Lopes do Couto, L. (2022). A inserção dos estudos radiofônicos e de mídia sonora na pós-graduação em Comunicação no Brasil. *Radiofonias—Revista De Estudos Em Mídia Sonora*, 12(3), 6-27. https://lc.cx/Kzi68K

Kulmukhametov, A., Rauber, A., & Becker, C. (2021). Improving data quality in large-scale repositories through conflict resolution. *International Journal on Digital Libraries,* 22, 365-383. https://doi.org/10.1007/s00799-021-00311-0

Leipämaa-Leskinen, H., Närvänen, E., & Makkonen, H. (2022). The rise of collaborative engagement platforms. *European Journal of Marketing*, 56(13), 26-49. https://doi.org/10.1108/EJM-11-2020-0798

L'Opdahl, A., Tessem, B., Dang-Nguyen, D., Motta, E., Setty, V., Throndsen, E., Tverberg, A., & Trattner, C. (2023). Trustworthy journalism through AI. *Data & Knowledge Engineering*, 146(8), 2-17. https://doi.org/10.1016/j.datak.2023.102182

Marques, M., Graf, L. (2024). Pushing Boundaries: The European Universities Initiative as a Case of Transnational Institution Building. *Minerva,* 62, 93-112. https://doi.org/10.1007/s11024-023-09516-w

Martins, N., Brandão, D., Guimarães, L., Penedos-Santiago, E., & Brandão, E. (2023). A Importância do Design de Comunicação no Processo de Disseminação de Práticas Comunitárias em Bairros Sociais: O Balteiro. *Comunicação e Sociedade*, 43, 2-24. https://doi.org/10.17231/comsoc.43(2023).4455

Maye, L., Robinson, S., Pantidi, N., Ganea, L., Ganea, O., Linehan, C., & McCarthy, J. (2020). Considerations for Implementing Technology to Support Community Radio in Rural Communities. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, USA, 453, 1-13. https://doi.org/10.1145/3313831.3376580

McMahon, D. (2021). In Tune with the Listener: How Local Radio in Ireland has Maintained Audience Attention and Loyalty. *Online Journal of Communication and Media Technologies*. https://doi.org/10.30935/OJCMT/11085.

Midões, C. (2021). Community Radios in Portugal: Mapping an Overlooked Alternative Media. *Online Journal of Communication and Technologies*, 11(3), 2-12. https://doi.org/10.30935/ojcmt/11086

Mogensen, K. (2014). Henry Jenkins, Sam Ford & Joshua Green: Spreadable media: Creating Value and meaning in A Networked Culture, New York: New York University Press. 2013. *MedieKultur: Journal of Media and Communication Research*, 30(56), 191-194. https://doi.org/10.7146/mediekultur.v30i56.16054

Napoli, P. (2011). *Audience evolution: New technologies and the transformation of media audiences*. Columbia University Press.

Napoli, P. (2019). *Social media and the transformation of media audiences*. Columbia University Press.

Nettlefold, J. (2019). Listening at the local level: the role of radio in building community trust. *Media International Australia*, 172(1), 74-88. https://doi.org/10.1177/1329878X19858662

NEWAVES (2024). *A project to shape Europe's digital future*. NEWAVES. https://newaves.eu/

Noni, I., Orsi, L., & Belussi, F. (2018). The role of collaborative networks in supporting the innovation performances of lagging-behind European regions. *Research Policy*, 47(1), 1-13. https://doi.org/10.1016/J.RESPOL.2017.09.006.

Papathanassopoulos, S., Giannouli, I., Archontaki, I., Karadimitriou, A. (2023). The Media in Europe 1990–2020. In S. Papathanassopoulos, A. Miconi (Eds.), *The Media Systems in Europe. Springer Studies in Media and Political Communication* (pp. 35-67). Springer, Cham. https://doi.org/10.1007/978-3-031-32216-7_3

Paris, B., & Donovan, J. (2019). *Deepfakes and cheap fakes: The manipulation of audio and visual evidence*. Data & Society Research Institute. https://lc.cx/SCLXZQ

Perkmann, M. (2003). Cross-border regions in Europe: Significance and Drivers of Regional Cross-Border Co-Operation. *European Urban and Regional Studies*, 10(2), 153-171. https://doi.org/10.1177/0969776403010002004

Rana, M. S., Nobi, M. N., Murali, B., Sung, A. H. (2022). Deepfake Detection: A Systematic Literature Review. *IEEE Access*, 10(1), 25494-25513. https://lc.cx/fTH0KP

Reyes-De-Cózar, S., Pérez-Escolar, M., & Navazo-Ostúa, P. (2022). Digital Competencies for New Journalistic Work in Media Outlets: A Systematic Review. *Media and Communication,* 10(1), 27-42. https://doi.org/10.17645/mac.v10i1.4439.

Sadat, M., & Alhassan, Y. (2013). The impact of staff-poaching among radio stations in the Kumasi metropolis. *Journal of Business Research*, 7(1), 35-49. https://lc.cx/5AlZxL

Saheb, T., Sidaoui, M., & Schmarzo, B. (2024). Convergence of artificial intelligence with social media: A bibliometric & qualitative analysis. *Telematics and Informatics Reports*, 14. https://doi.org/10.1016/j.teler.2024.100146

Santos, F. (2023). Artificial Intelligence in Automated Detection of Disinformation: A Thematic Analysis. *Journalism and Media*, 4(2), 679-687. https://doi.org/10.3390/journalmedia4020043

Sasse, L. (2023). *Culture: Promoting diversity and cohesion*. European Parliament Factsheets. European Parliament. https://www.europarl.europa.eu/factsheets/en/sheet/137/culture

Severijnen, M., & Haan, Y. (2024). Educating for a Changing Media Landscape: Four Scenarios for Journalism Education in 2030. Journalism Studies, 25(16), 1931-1948. https://doi.org/10.1080/1461670X.2024.2406814

Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake News Detection on Social Media: A Data Mining Perspective. *ACM SIGKDD Explorations Newsletter*, 19(1), 22-36. https://doi.org/10.1145/3137597.3137600

Shu, K., Wang, S., Lee, D., & Liu, H. (2020). Mining disinformation and fake news: Concepts, methods, and recent advancements. In K. Shu, S. Wang, D. Lee, & H. Liu (Eds.), *Disinformation, misinformation, and fake news in social media: Emerging research challenges and opportunities* (pp.1-19). Springer. https://doi.org/10.48550/arXiv.2001.00623

Timalsina, M., & Pradhan, P. (2019). Role of Local/Community Radio on Rural Development. *Nepalese Journal of Development and Rural Studies,* 16, 46-52. https://doi.org/10.3126/njdrs.v16i0.31570

Verza, S., Blagojev, T., Borges, D., Kermer, J., Trevisan, M., & Reviglio, U. (Eds.)(2024). *Uncovering news deserts in Europe. Risks and opportunities for local and community media in the EU*. European University Institute. https://doi.org/10.2870/741398

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359(6380), 1146-1151. https://doi.org/10.1126/science.aap9559

Wenzel, A. (2023). Mutual aid for local journalism?: A public media collaborative. *Journalism,* 24(12), 2632-2650. https://doi.org/10.1177/14648849231173204

Zhao, Z., Peng, M., Ding, Z., Wang, W., & Poor, H. (2016). Cluster Content Caching: An Energy-Efficient Approach to Improve Quality of Service in Cloud Radio Access Networks. *IEEE Journal on Selected Areas in Communications*, 34(5), 1207-1221. https://doi.org/10.1109/JSAC.2016.2545384