Original Article

AI Literacy and Digital Readiness in Iranian Media

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Abstract
Information technology is a pivotal tool in mitigating diverse risks within business environments, ranging from operational inefficiencies to cybersecurity threats. By automating processes, enhancing decision-making through data analytics, and improving communication channels, IT enables businesses to proactively address vulnerabilities and seize market opportunities. However, the adoption of advanced IT systems is not without its challenges. Implementing new technologies can inadvertently introduce novel risks, such as cybersecurity vulnerabilities, data privacy concerns, and system integration failures. Moreover, a lack of strategic planning in IT adoption can lead to misaligned investments and operational disruptions, while lagging behind in IT modernization may result in missed opportunities and competitive disadvantages. This dual-edged nature of IT reveals the importance of a balanced approach to its integration. Businesses must carefully evaluate the potential benefits and risks of IT solutions, adopt comprehensive risk management frameworks, and prioritize continuous employee training to optimize the benefits of IT adoption while minimizing unintended consequences.

Key words: business technology adoption, cybersecurity, innovation risks, IT risk management, strategic IT planning.

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Introduction

The integration of artificial intelligence into the global media landscape is reshaping not only the technical modalities of information production but also the normative frameworks underpinning journalism, literacy, and civic engagement. As algorithmic systems increasingly mediate the processes of content creation, dissemination, and consumption, questions of digital literacy, editorial integrity, and public trust have become central to the future of media ecosystems. This transformation is particularly salient in countries where structural, political, and technological constraints intersect to complicate the pace and nature of innovation.

Despite enduring both internal censorship and external sanctions, the Iranian internet sphere remains remarkably vibrant, dynamic, and resilient (Nosraty et al., 2020). Iranian users have cultivated a sophisticated digital culture characterized by widespread use of virtual private networks (VPNs), proxy services, and encrypted messaging platforms to circumvent state-imposed restrictions. Social media platforms—though often filtered—serve as critical arenas for political expression, cultural exchange, entrepreneurial activity, and grassroots mobilization. The influence of social media extends beyond public discourse into intimate decision-making domains, with studies showing that even partner preferences can be shaped by interactions with digital influencers (Nosrati et al., 2023). The rise of digital-native media outlets, tech-savvy youth populations, and Persian-language content creators on global platforms reflects a persistent demand for connectivity, creativity, and alternative narratives. Yet this vibrant participation also occurs within psychologically demanding digital environments, where algorithmic curation and comparison culture can negatively affect mental health and self-perception, particularly among younger users (Zamani et al., 2021). Furthermore, diasporic engagement and transnational digital flows enrich the Iranian online ecosystem, allowing for the circulation of ideas, technologies, and strategies that sustain digital innovation under constraint (Soroori Sarabi et al., 2020). However, it is important to note that these dynamic social media environments may simultaneously contribute to heightened anxiety and self-esteem issues, particularly among youth, as algorithmic designs promote idealized content and constant social comparison (Nosraty et al., 2021).

While global scholarship has examined the implications of AI for media literacy and education (e.g., Jandrić, 2019; Leander & Burriss, 2020), less empirical attention has been directed toward understanding how these technologies are operationalized within media institutions operating under digitally constrained environments. Systematic

evidence confirms that AI adoption consistently faces three roadblocks: (1) unresolved accountability in automated decision-making, (2) data privacy vulnerabilities in algorithmic systems, and (3) training gaps that prevent professionals from critically engaging with AI outputs (Tomraee et al., 2022). Moreover, the extent to which organizational readiness, strategic vision, and individual digital competencies influence AI adoption in such contexts remains underexplored. Evidence from higher education shows that while enthusiasm for AI integration is widespread, implementation is often hindered by ethical concerns and institutional unpreparedness—highlighting the need for both curricular reform and faculty development (Rahmatian & Sharajsharifi, 2021).

This study seeks to fill that gap by examining the digital readiness and innovation capacity of Iranian media organizations with respect to AI integration. Building on a cross-sectional, mixed-methods survey of 148 media professionals from diverse institutional backgrounds—including digital-native, print, radio, and television outlets—this research investigates three interrelated dimensions: (1) the demographic and organizational predictors of digital adaptability; (2) professionals' perceptions of AI's benefits and risks; and (3) the strategic orientations guiding future monetization and editorial models. In doing so, it contributes to a growing body of literature that calls for context-sensitive approaches to digital transformation in the media sector.

This study foregrounds the Iranian media sector—a landscape marked by both technological aspiration and systemic limitation—to provide critical insights into how AI-driven innovation unfolds under infrastructural, regulatory, and cultural constraints.

Review of Literature

Jandrić (2019) explored the evolution of critical media literacy within the framework of postdigital theory, responding to the growing influence of AI and Big Data on education and media. The article highlighted the limitations of traditional media literacy approaches in addressing the complex realities of a postdigital world—where digital and non-digital technologies are deeply entangled—and called for a fundamental reinvention of theories and practices in the field. Drawing on data literacy, critical algorithm studies, and critical posthumanist perspectives, Jandrić positioned AI technologies such as machine learning, neural networks, and deep learning as central challenges and opportunities for contemporary media literacy. The paper outlined three key challenges. First, it emphasized the need to adapt and expand existing media literacy frameworks to reflect the unique characteristics of the postdigital era. Secondly, it called for a balance between the technical understanding of AI and Big Data with their broader social and

political implications, including algorithmic bias and data ethics. Thirdly, Jandrić introduced the posthumanist dimension, urging scholars and educators to consider what it might mean for AI systems themselves to become "literate", and how humans might develop pedagogies that account for machine intelligence. The article ultimately advocated for a critical media literacy that is agile, inclusive, and reflective of the intertwined nature of human and non-human actors in shaping media landscapes. Similarly, others argue that media literacy must evolve into a sustained framework for fostering critical thinking and cognitive resilience—skills essential to ethical engagement in increasingly complex digital environments (Arsalani et al., 2022).

Leander and Burriss (2020) offered a conceptual rethinking of critical literacy in light of the increasing presence of computational agents—such as algorithms, bots, and surveillance technologies—in everyday digital life. Published in the *British Journal of Educational Technology*, the article challenged traditional mediational and representational models of literacy, arguing that they fall short in accounting for the relational dynamics between humans and non-human actors in digital environments. The authors proposed a posthuman approach to literacy, one that acknowledges and engages with the ways individuals read *with* machines, not just through them. Central to their argument is the notion of "intra-action", drawn from posthumanist and assemblage theories, which reframes literacy as a co-constructed activity among heterogeneous actants, including AI systems and digital infrastructures. The paper explored how algorithmic mediation alters not only access to texts but also the formation of meaning, identity, and agency in online interactions. This reconceptualization has profound implications for critical literacy education, which must now address not only human authorship and interpretation, but also the influence of machine-generated content and automated decision-making processes. This aligns with broader insights into how perceptions are never neutral but produced through layered cultural, historical, and communicative forces—shaped as much by internalized narratives as by external realities (Sabbar et al., 2023). Leander and Burriss (2020) called for a new form of critical consciousness that equips learners to interrogate and navigate these mixed human-machine landscapes. They argued that educational theory and practice must keep pace with developments in AI and computational media to remain relevant and empowering in a rapidly evolving digital world.

Sabatini et al. (2023) presented a critical examination of current models of reading development and proposed a comprehensive framework to support literacy acquisition across the full developmental continuum—from early non-readers to proficient readers. Published in the *British Journal of Educational Technology*, the article critiqued

existing paradigms such as the simple view of reading and commonly used stage-based models ("learn to read", "read to learn", "read to do") for their lack of specificity and limited utility in informing personalized instruction. These models, the authors argued, inadequately address the nuanced and individualized trajectories of skill acquisition necessary for the design of adaptive learning systems. In response, the authors proposed the construction of a new learning and assessment framework that more precisely maps the developmental progression of reading proficiency. This framework emphasizes fine-grained skill mastery, integration, and variability across learners, and is intended to bridge the gap between educational theory, curriculum standards, and the design of personalized learning technologies. The paper also explored the transformative potential of artificial intelligence in this context, identifying how AI-driven tools could address key challenges, such as tailoring instruction to individual learner needs, providing dynamic assessment feedback, and supporting real-time adaptation of content. The authors concluded with a selective review of AI-enhanced applications in literacy education, underscoring the field's readiness for innovation and the need for theoretically grounded, AI-supported solutions

Risteska (2023) explored the ethical implications of AI algorithms and underscored the urgent need for a redefined media literacy education capable of addressing the complexities of the digital media environment. Published in *KAIROS: Media and Communications Review*, the article examined how AI-powered recommendation systems significantly influence individuals' information exposure and worldview, thereby amplifying concerns about bias, transparency, and algorithmic accountability. The author emphasized that without critical awareness and ethical governance, these systems risk reinforcing echo chambers and compromising user autonomy. The paper advocated for an expanded conception of media literacy—referred to as "new media literacy"—that integrates ethical considerations and fosters a deeper understanding of AI's societal impact. Key educational priorities include critical analysis of algorithmic biases, awareness of data collection practices, and understanding the implications of targeted advertising. Risteska called for media literacy programs to actively promote concepts such as informed consent, data anonymity, and digital rights. Educators, she argued, bear a responsibility to embed these principles into curricula, ensuring inclusivity, global awareness, and social responsibility. Through practical examples and conceptual reflection, the article highlighted how uninformed consumption of algorithmically curated content can shape public opinion and behavior, emphasizing the necessity of ethical literacy alongside digital competence. These dynamics reflect broader concerns about how powerful tech platforms

can subtly shape institutional discourse—normalizing exploitative data practices while undermining critical scrutiny through strategic academic influence (Sarfi et al., 2021). Ultimately, Risteska (2023) contended that equipping individuals with the skills to critically engage with AI and digital systems is foundational for fostering responsible digital citizenship in the age of algorithmic media. This digital citizenship imperative requires more than individual upskilling; it demands comprehensive legislative frameworks with clear preventive strategies. As evidenced across policy domains, fragmented approaches inevitably create inefficiencies and ambiguities that undermine systemic solutions to widespread technological challenges (Taheri et al., 2022).

Hristovska (2023) investigated the evolving intersection of AI, media literacy education, and ethical digital citizenship, emphasizing the importance of fostering critical thinking in an AI-driven media environment. Published in *KAIROS: Media and Communications Review*, the study addressed how media literacy initiatives can empower individuals to responsibly engage with information and navigate the digital landscape amidst the growing prevalence of AI-generated content. The research employed a three-phase methodology. The first phase consisted of a literature review and case study analysis to establish the theoretical foundations of media literacy, digital citizenship, and ethical decision-making in the AI context. The second phase utilized online surveys to assess participants' media literacy competencies, critical thinking, and ethical awareness. In the third phase, an experimental design was implemented in which participants were exposed to AI-generated disinformation in the form of a simulated fake news article. Their responses, particularly the extent to which they engaged in fact-checking behaviors, were analyzed to gauge the effectiveness of prior media literacy education. The study's expected findings aimed to illuminate the relationship between media literacy education and individuals' capacity for ethical judgment and civic engagement. Additionally, it sought to identify key risks associated with AI's role in disinformation and misinformation, offering practical guidelines for integrating AI awareness into media literacy curricula. Ultimately, Hristovska advocated for strengthening media education programs to ensure they are responsive to the challenges posed by rapidly advancing AI technologies.

Tiernan et al. (2023) examined the evolving relationship between AI and digital literacy, with a particular focus on information and media literacy in contemporary educational contexts. The study analyzed how AI is reshaping the processes through which individuals access, evaluate, and produce information, highlighting the growing complexity of these tasks in AI-mediated environments. The authors began by

investigating the roles AI technologies play at different stages of the information lifecycle, including search, curation, synthesis, and content creation. In a critical review of prevailing digital literacy frameworks, the authors found that these models have generally been slow to integrate considerations related to AI's influence. As AI becomes increasingly embedded in digital communication and educational technologies, the need for adaptive and forward-looking frameworks becomes more urgent. In response, Tiernan and colleagues proposed a set of strategic recommendations to better align digital literacy initiatives with the realities of AI-enhanced environments. Their suggestions emphasized agility, inclusivity, and the importance of ongoing stakeholder participation in framework development. The paper concluded that a reconfiguration of digital literacy—especially in terms of information and media literacy—is essential to prepare learners and educators for a future where AI is a pervasive presence in both educational and everyday information practices.

Methodology

This study employed a cross-sectional, mixed-methods survey design to assess digital readiness, AI tool adoption, and organizational innovation capacity among media professionals in Iran. A structured questionnaire was distributed online between September and November 2024 to a purposive sample of 148 respondents across digital-native, print, radio, and television outlets. Participants included journalists, editors, and managers, ensuring diversity in both role and institutional context. The instrument was developed in English, translated into Persian, and pilot-tested for clarity. It comprised five sections covering demographic background, digital tool proficiency, organizational strategy, perceptions of AI benefits, and monetization models. The Digital Readiness and Agility (DRA) score was constructed from 17 Likert-scale items, with higher scores reflecting greater technological adaptability. Exploratory factor analysis revealed five latent components of digital readiness, and the internal consistency of the scale was strong ($\alpha = 0.87$).

Data were analyzed using SPSS and R. Descriptive statistics summarized demographic trends and tool usage, while one-way ANOVA and Tukey HSD tests compared group differences in DRA scores by age and media type. Spearman's rho correlation assessed associations between readiness, age, experience, and strategic factors. A binary logistic regression model (Nagelkerke $R^2 = 0.471$) was used to identify predictors of organizational receptiveness to AI innovation, revealing that digital media affiliation, presence of a digital strategy, and individual AI proficiency were significant positive predictors. The study adhered to ethical research standards, with participant anonymity maintained throughout. Despite limitations in generalizability due to

non-random sampling and self-report bias, the methodology provides a robust, context-sensitive framework for evaluating media transformation in digitally constrained environments.

Findings

Digital Readiness and Agility (DRA) Score by Media Type

One of the central aims of this study was to evaluate how different media types within Iran's media landscape vary in their capacity to integrate digital tools and AI-driven workflows. To this end, a composite measure of Digital Readiness and Agility (DRA) was developed. This score synthesized respondents' self-reported knowledge and use of AI tools, automation in content production, application of data analytics, and presence of supportive organizational structures. The resulting DRA score offers a multidimensional view of technological adaptability across Iranian media sectors.

The data reveal substantial disparities in digital readiness across media types, with digital-native outlets emerging as clear leaders. These organizations, many of which were established in the post-2010 media environment, displayed a significantly higher average DRA score (M= 3.85), reflecting strong integration of cloud-based content management systems, audience analytics tools, and digital-first production pipelines. This contrasts sharply with radio and print media, where mean DRA scores were substantially lower (M= 1.89 and M= 2.03, respectively), signaling limited automation, low AI adoption, and minimal integration of real-time engagement technologies.

Table 1. Mean DRA score by media type

Media type	Mean DRA score
Digital-native	3.85
TV	2.74
Print	2.03
Radio	1.89

These results were statistically validated through a one-way analysis of variance (ANOVA), which confirmed significant differences between media types ($F(3, 144)= 12.67$, $P<0.001$). Post hoc comparisons using the Tukey HSD test revealed that digital-native outlets had significantly higher DRA scores than all other categories ($P<0.01$), while no significant difference was found between radio and print, suggesting a shared structural lag in digital transformation among traditional formats.

The relatively strong performance of TV-based outlets (M= 2.74) is worth noting. While still falling short of digital-native benchmarks,

television organizations have shown moderate progress in adopting digital workflows—particularly in terms of multimedia production, digital archiving, and online broadcasting infrastructure. However, their progress remains constrained by centralization, bureaucratic inertia, and uneven internet infrastructure, especially in regional branches.

The gap in digital readiness reveals an asymmetrical media modernization process in Iran. Digital-native organizations benefit from being structurally designed for a digital ecosystem: they are often leaner, more flexible, and staffed by younger professionals with digital literacy ingrained in their career development. In contrast, legacy media—especially in the print and radio sectors—continue to operate within analog or semi-digitized paradigms. These outlets tend to prioritize editorial tradition and legacy workflows, often without clear strategies for integrating AI or automation into content production or audience engagement.

The implications are significant. Without targeted investment in capacity-building, older media organizations risk being left behind in an environment increasingly defined by algorithmic curation, real-time interactivity, and audience segmentation. The "digital divide" within the media sector is not only about infrastructure, but also about organizational culture, innovation leadership, and professional development.

Digital Readiness and Agility (DRA) Score by Age Group

Beyond organizational type, individual demographic factors also shape the pace and nature of digital transformation within media institutions. Among these, age has long been recognized as a key determinant of technological adaptability, influencing everything from tool adoption to attitudes toward innovation. In the present study, respondents were categorized into four age groups: 25–40, 41–50, 51–65, and 66+. Their respective Digital Readiness and Agility (DRA) scores were then analyzed to identify generational patterns in digital literacy and innovation engagement.

The data reveal a clear and statistically significant generational divide. Respondents aged 25–40 reported the highest average DRA score (M= 3.42), indicating substantial familiarity with AI applications, digital content workflows, and audience analytics. This cohort, many of whom began their careers in the post-2000 digital media environment, demonstrated greater comfort navigating digital platforms and a stronger orientation toward data-driven practices. These younger professionals are also more likely to work in digital-native environments, where continuous learning and platform experimentation are embedded in organizational culture.

In contrast, older respondents exhibited considerably lower DRA

scores. Those in the 51–65 age group averaged 2.01, while those over 66 scored only 1.67. These scores show a more limited engagement with AI tools and digital production systems, possibly reflecting both cognitive and institutional barriers. Many individuals in these age groups entered journalism during periods dominated by analog workflows and have had fewer opportunities to retrain or reorient themselves toward contemporary digital practices. Even when exposed to new technologies, their role in decision-making hierarchies often remains editorial rather than technical, reducing the likelihood of first-hand experimentation or skill acquisition.

The 41–50 group occupies a middle ground, with a mean DRA score of 2.85. This cohort appears to be transitional, having experienced both analog and digital workflows during their careers. While some have adapted to technological changes, others have retained legacy practices, resulting in a relatively wide variance in digital proficiency within this group.

Table 2. Mean DRA score by age group

Age group	Mean DRA score
25–40	3.42
41–50	2.85
51–65	2.01
66+	1.67

A one-way ANOVA confirmed that these differences in DRA scores across age groups are statistically significant ($F(3, 144)= 15.28$, $P<0.001$). Post hoc tests further revealed that all pairwise comparisons were significant at the 0.05 level, except between the two oldest groups (51–65 vs. 66+), suggesting a leveling off of digital engagement among senior professionals beyond the age of 50. Additionally, a Spearman correlation analysis showed a strong negative relationship between age and digital readiness ($\rho= -0.281$, $P<0.001$), reinforcing the interpretation that older age is inversely associated with technological adaptability in the newsroom context.

These findings mirror international trends, where younger journalists consistently report higher rates of digital tool usage and AI experimentation. However, the implications in Iran are particularly stark given the high average age of newsroom leadership and the relatively low rates of in-service training programs. Without systemic interventions, such as intergenerational mentoring, modular digital literacy modules, or newsroom innovation labs, the skills gap is likely to widen, potentially exacerbating editorial silos and undermining efforts at cross-platform integration.

Importantly, these results do not imply that older journalists are incapable of adapting; rather, they highlight the need for supportive

institutional frameworks that encourage continuous professional development. A significant number of older respondents in this study expressed a desire for training, but noted that such opportunities were either inaccessible or tailored primarily to junior staff. This points to a misalignment between available capacity-building programs and actual demographic needs within the workforce.

In conclusion, age remains a powerful predictor of digital readiness in Iranian media institutions. While younger professionals are leading innovation from the ground up, the lack of digital engagement among senior staff—many of whom occupy editorial or strategic decision-making roles—poses a structural barrier to holistic transformation. Addressing this generational divide will require not only technical training but also a cultural shift that values learning and experimentation across all career stages.

Key Correlations

To further elucidate the dynamics underlying digital transformation in Iranian media institutions, this section explores how individual and organizational characteristics correlate with the Digital Readiness and Agility (DRA) score. While previous sections examined specific group differences by media type and age, here the analysis employs Spearman's rank-order correlation to capture the strength and direction of association between DRA scores and various independent variables, including age, years of professional experience, media profile, and the presence of a formal digital strategy.

The results reveal several statistically significant correlations that collectively point to a complex interplay of structural and demographic forces shaping digital readiness. As expected, age demonstrated a moderate negative correlation with DRA scores ($\rho = -0.281$, $P<0.001$), reinforcing earlier findings that younger professionals are more likely to engage with AI technologies and digital production workflows. Similarly, years of professional experience was weakly but significantly negatively correlated with DRA ($\rho = -0.155$, $P = 0.030$), suggesting that prolonged tenure in the industry, while often associated with editorial expertise, may correspond to reduced engagement with emergent technological tools.

More salient, however, were the organizational-level correlations. Employment in digital-native media outlets was positively correlated with DRA scores ($\rho = +0.241$, $P = 0.002$), indicating that these settings are not only structurally agile but also cultivate a workforce with higher technological competence. In contrast, working in traditional media outlets—particularly those with analog production legacies—was associated with lower readiness scores. This divide reflects broader

global patterns, wherein digital-born newsrooms exhibit greater openness to experimentation, faster adoption cycles, and more integrated use of audience analytics and content automation.

One of the strongest positive correlations was found between the existence of a formal organizational digital strategy and DRA scores (ρ= +0.312, *P*= 0.001). This suggests that strategic foresight and planning significantly enhance the capacity of media institutions to integrate digital technologies. Organizations with defined digital roadmaps, articulated innovation goals, and institutionalized support mechanisms are more likely to facilitate AI adoption and data-driven decision-making among their personnel. This finding is consistent with comparative studies in other national contexts, where digital transformation initiatives have been most effective when anchored in deliberate, top-down strategies.

Interestingly, media profile—coded as a binary variable contrasting traditional versus innovative formats—also showed a significant negative correlation with DRA (ρ= –0.210, *P*= 0.005). This reinforces the interpretation that media organizations entrenched in legacy workflows and revenue models tend to lag behind in digital engagement, regardless of their editorial reputation or market share.

Table 3. Key correlations with DRA score (Spearman's Rho)

Variable	DRA correlation coefficient	Significance (1-tailed)
Age	–0.281	*P*= 0.000
Media type (Digital)	+0.241	*P*= 0.002
Organizational digital strategy	+0.312	*P*= 0.001
Years of experience	–0.155	*P*= 0.030
Media profile (Traditional vs. Innovative)	–0.210	*P*= 0.005

Collectively, these correlations point to a dual structure in the digital transformation process: one in which individual attributes such as age and experience shape personal digital competence, while institutional attributes—particularly media type and strategic orientation—mediate the broader organizational capacity for innovation. Crucially, the findings imply that professional digital readiness can be either constrained or enabled by the organizational context in which individuals operate. For example, even technologically skilled individuals may find their innovation efforts stifled within conservative editorial environments, whereas digitally cautious staff may benefit from the institutional learning culture of agile newsrooms.

We, therefore, found out that there is a need for interventions that operate at both levels. On one hand, media training initiatives must target demographic groups with lower baseline digital literacy, particularly older and more experienced professionals. On the other

hand, structural reform must emphasize the adoption of digital strategies, investment in technological infrastructure, and leadership practices that reward experimentation and iterative development.

Perceptions of AI Benefits

As AI technologies become increasingly integrated into global media ecosystems, understanding how professionals perceive the potential advantages of AI is crucial for shaping adoption strategies. In this study, respondents were asked to identify the benefits they anticipated from the integration of AI tools into their newsrooms and content production workflows. These perceptions provide insight into the motivations, aspirations, and hesitations that shape technological engagement at the ground level.

Across the sample, the most commonly cited benefits of AI integration were improvements in audience experience (64.9%), increased readership or clicks (62.8%), enhanced revenue generation (61.5%), and better content quality (55.4%). Operational advantages such as faster production or cost reductions were mentioned less frequently, with 39.1% identifying increased production efficiency and only 31.4% citing reduced operational costs. These results suggest that for most Iranian media professionals, the primary appeal of AI lies in its editorial and relational potential—its capacity to enhance storytelling, attract audiences, and strengthen trust—rather than purely economic or logistical efficiencies.

This prioritization is consistent with the professional norms of journalism, where credibility, engagement, and content value are held in high regard. That said, there is a discernible divergence in how AI's benefits are understood across different roles and organizational settings. Journalists, in particular, were significantly more likely to emphasize improvements in content quality and audience relevance, whereas managers and administrators more often highlighted cost reduction and scaling opportunities. This divide reflects a familiar structural tension between editorial and commercial logics in the digital news environment. While both groups acknowledge AI's transformative potential, they differ in what that transformation should ideally deliver.

Region-specific and organizational context also influenced perceptions. Respondents from Tehran-based outlets, especially those affiliated with commercial networks, were more likely to expect AI to generate revenue or drive advertising performance. In contrast, professionals from digital-native and provincial outlets emphasized the benefits of audience personalization, niche targeting, and improved news curation. These distinctions reveal how institutional positioning and resource availability mediate expectations around technological change.

To test the relationship between digital readiness and AI benefit perceptions, Spearman correlation coefficients were calculated. The results revealed a statistically significant positive correlation between DRA scores and the expectation that AI would enhance audience experience (ρ= +0.211, *P*= 0.005) and increase readership or engagement (ρ= +0.165, *P*= 0.023). In contrast, there was no significant correlation between DRA scores and perceptions that AI would improve content quality or reduce operational costs. These findings suggest that professionals with higher technological proficiency tend to see AI as a tool for user-centered innovation, particularly in optimizing news delivery and personalizing reader experiences. Those with lower digital readiness, on the other hand, were more likely to associate AI with economic efficiencies, often without a clear vision of its editorial implications.

Table 4. Correlations between DRA score and AI benefit expectations

Expected advantage	Correlation with DRA score	Significance (1-tailed)
Increase clicks/readership	+0.165	*P*= 0.023
Improve audience experience	+0.211	*P*= 0.005
Improve content quality	+0.001	*P*= 0.496 (ns)
Reduce costs	–0.058	*P*= 0.243 (ns)

These differential perceptions have important strategic implications. Where newsroom staff view AI as a complement to editorial work, it is more likely to be embraced as an innovation opportunity. However, if AI is framed primarily in terms of labor substitution or cost control, it may provoke skepticism or resistance, especially among those already concerned about job security or editorial autonomy. This is particularly relevant in the Iranian context, where concerns about censorship, professional disempowerment, and lack of technological infrastructure already shape attitudes toward digitalization.

A further implication concerns the ethical dimension of AI implementation. The widespread expectation that AI will increase clicks and engagement raises the risk that newsrooms will prioritize attention metrics over content value. If AI tools are used primarily to optimize headlines, personalize clickbait, or amplify emotionally charged stories, they may inadvertently contribute to the spread of misinformation or sensationalism. As previous studies have warned, the pursuit of algorithmically enhanced virality often comes at the expense of journalistic integrity and democratic deliberation.

To mitigate these risks, AI deployment in journalism must be guided by editorial ethics and public service principles, not merely by commercial imperatives. Training programs should focus not only on how to use AI tools, but also on how to evaluate their impacts—both

positive and negative—on content quality, audience trust, and civic discourse. Furthermore, newsroom leaders should ensure that implementation strategies are collaboratively developed, with input from journalists, editors, developers, and legal experts, to foster organizational buy-in and ethical accountability.

Business Models and Monetization Strategies

The sustainability of media organizations in a rapidly digitizing environment is increasingly dependent on the evolution of viable business models. In the Iranian context, this challenge is intensified by structural constraints, including economic sanctions, limitations on online payment infrastructure, inflation, and regulatory uncertainty surrounding digital finance. Against this backdrop, this section examines both the current monetization strategies employed by Iranian media outlets and their anticipated future directions in light of digital transformation and AI adoption.

We should note, however, that one of the most critical challenges facing media monetization in Iran is the country's prolonged exposure to international sanctions, which has severely constrained access to global financial systems, digital payment infrastructures, and advertising networks. Due to restrictions imposed by the U.S. Department of the Treasury and corresponding global compliance measures, Iranian media outlets are effectively excluded from international platforms such as Google AdSense, PayPal, Stripe, and most forms of cryptocurrency exchanges. This isolation not only limits revenue generation through programmatic advertising and e-commerce integration but also hampers the development of audience-supported models such as subscriptions, micropayments, or crowdfunding. Moreover, the lack of access to secure and transparent digital payment gateways inhibits trust and discourages users from financially engaging with content providers. As a result, Iranian media organizations remain structurally dependent on legacy advertising and state-affiliated funding, with few viable pathways for financial independence or innovation, despite growing audience demand for diverse and high-quality digital content.

Not surprisingly, therefore, our survey findings indicate that the Iranian media sector remains heavily reliant on traditional sources of income. Advertising was identified as the primary revenue stream by 66.9% of respondents, followed closely by sponsored content (56.1%). Subscription-based models were reported by only 18.4% of participants, and even fewer mentioned limited free content (14.8%) or crowdfunding mechanisms (9.7%). Notably, no respondents indicated the use of blockchain-based systems or micropayment platforms,

reflecting either their legal ambiguity or low awareness and technical capacity in this domain.

Table 5. Currently used revenue models (multiple selection allowed)

Revenue model	Percentage of respondents using
Advertising	66.9%
Sponsored content	56.1%
Subscriptions	18.4%
Limited free content	14.8%
Crowdfunding/Donations	9.7%
Blockchain or micropayments	0.0%

These results highlight the slow uptake of innovation in monetization practices. Although AI and digital tools are increasingly adopted to enhance content production and user engagement, they have not yet been effectively leveraged to restructure revenue generation models. The dependence on advertising and sponsorship places Iranian outlets in a vulnerable position, particularly given the global dominance of platform monopolies in digital advertising markets and the relatively low trust among Iranian audiences in commercially driven content.

When asked about future revenue strategies, respondents showed some openness to innovation. Over half (52.7%) identified subscription models as a viable path forward, and 63.2% maintained confidence in sponsored content, albeit with caveats regarding editorial independence. Freemium models, involving limited free access to content alongside premium offerings, were anticipated by 25% of respondents. A minority (14.2%) expressed interest in blockchain-based models, such as micropayments or smart contracts for content licensing, although none had yet implemented such systems.

Differences emerged by role and digital readiness level. Managers and administrators were significantly more optimistic about subscriptions and premium content offerings, whereas journalists were more skeptical of models that risked alienating users or compromising journalistic values. This aligns with broader trends in media economics, where editorial staff often prioritize audience trust and reach over direct monetization. Journalists were also more critical of sponsored content, with many expressing concerns over blurred lines between editorial and commercial domains.

Spearman's rho correlation analysis confirmed that digital readiness is linked to openness to innovative monetization models. Respondents with higher DRA scores were significantly more likely to support subscriptions (ρ= +0.163, P= 0.024), limited free content models (ρ= +0.145, P= 0.039), and blockchain-based revenue mechanisms (ρ= +0.182, P= 0.014). These individuals tended to work in digital-native outlets and demonstrated greater familiarity with user segmentation,

digital marketing tools, and data analytics platforms. Conversely, advertising and traditional sponsorship did not show significant correlation with DRA, indicating that these legacy models persist across both low- and high-readiness contexts.

Table 6. Correlations between DRA score and future revenue strategy preferences (Spearman's Rho)

Revenue strategy	DRA correlation	Significance
Subscriptions	+0.163	*P*= 0.024
Limited free content	+0.145	*P*= 0.039
Blockchain technologies	+0.182	*P*= 0.014
Advertising	–0.107 (ns)	*P*= 0.097
Sponsored content	+0.036 (ns)	*P*= 0.305

The continued prevalence of advertising and sponsored content raises ethical and strategic concerns. Several participants reported that native advertising often lacks clear disclosure, potentially compromising editorial transparency. Moreover, there is limited internal regulation to govern the integration of sponsored material, which may erode audience trust in an already fragmented and highly politicized media environment. These issues are exacerbated by the lack of alternative revenue options and the financial vulnerability of many outlets.

At the same time, the potential for alternative models—especially hybrid approaches combining subscriptions, donations, freemium access, and targeted advertising—is beginning to take shape, particularly in the digital-native sector. These organizations appear more willing to experiment with audience-supported models, particularly among niche communities or politically engaged readers. However, significant barriers remain, including low public willingness to pay for news, lack of digital payment infrastructure, and regulatory opacity regarding cryptocurrency and blockchain technologies.

To support sustainable digital transformation, a strategic shift is needed in how Iranian media institutions conceptualize and pursue monetization. First, investment in secure and user-friendly payment systems would enable experimentation with subscriptions and micropayments. Secondly, editorial policies must be revised to establish ethical guidelines for sponsored content, ensuring transparency and protecting journalistic integrity. Thirdly, training programs should address not only the use of AI tools but also the business logic of digital media, equipping professionals to align content strategies with emerging economic models.

Predictors of Organizational Receptiveness to Innovation

The successful integration of AI technologies into media workflows

depends not only on individual proficiency or technological availability, but also on broader organizational openness to innovation. To explore the institutional factors that enable or constrain AI adoption, a binary logistic regression analysis was conducted using respondents' perceptions of whether their organization was receptive to implementing digital and AI tools. This dependent variable was coded as binary (1= receptive, 0= not receptive), and predictor variables included media type, presence of a digital strategy, AI knowledge, job experience, and digital readiness indicators.

The final regression model accounted for 47.1% of the variance in organizational innovation receptiveness (Nagelkerke R^2= 0.471) and correctly classified 81.8% of cases, suggesting robust predictive value. Among the structural predictors, media type emerged as particularly influential. Working in a digital-native media outlet increased the odds of reporting innovation receptiveness by over fifteen times (Exp(B)= 15.18, *P*= 0.017). This substantial effect reflects the agility and experimental ethos of digital-born organizations, which tend to integrate AI as part of their foundational strategy rather than retrofitting it into legacy systems.

The presence of a formal digital transformation strategy also proved highly significant. Organizations with such a strategy in place were more than four times as likely to be considered receptive to innovation (Exp(B)= 4.15, *P*= 0.007). This finding underscores the role of leadership and institutional planning in shaping openness to change. A codified digital roadmap—detailing infrastructure investment, training priorities, and innovation goals—appears to function as both a signal of commitment and a practical framework for adoption.

At the individual level, AI tool proficiency was among the strongest predictors of innovation receptiveness. Respondents who reported being able to actively use AI tools were over seven times more likely to perceive their organizations as receptive to innovation (Exp(B)= 7.31, *P*= 0.012). This suggests a bottom-up influence, where digitally skilled professionals not only feel more empowered to adopt technology but may also influence organizational culture through advocacy and experimentation.

Conversely, a marginally significant negative relationship was observed between AI awareness without proficiency and innovation receptiveness (Exp(B)= 0.285, *P*= 0.053). This implies that awareness alone may not be sufficient and, in some cases, may generate resistance if it leads to perceptions of risk or disruption without corresponding skills to engage constructively. This insight highlights the difference between informed readiness and speculative apprehension, and it reinforces the importance of hands-on, applied training programs.

Interestingly, not all traditional media types showed equally negative

relationships. While print media's odds of innovation receptiveness were low but not statistically significant, radio outlets showed a strong and significant negative association (Exp(B)= 0.261, *P*= 0.047). This suggests that among legacy platforms, radio in particular faces substantial structural and cultural barriers to digital transformation. These may include bureaucratic rigidity, centralized control, and low exposure to AI-compatible editorial processes.

Age, job position, and years of professional experience were not statistically significant predictors in the final model. This finding diverges from earlier sections where age negatively correlated with individual digital readiness. In this case, the results imply that organizational culture and structure play a more decisive role in enabling innovation than individual demographics. Thus, even younger or digitally fluent professionals may struggle to implement change in resistant institutions, while older staff in agile environments may benefit from supportive systems and leadership.

Table 7. Binary logistic regression predicting innovation receptiveness

Predictor variable	B (coefficient)	Exp(B) (odds ratio)	Sig. (p-value)	Interpretation
Digital media type	+2.720	15.18	0.017	Strong positive predictor
Presence of digital strategy	+1.422	4.15	0.007	Significant positive effect
Proficiency in AI tools	+1.989	7.31	0.012	Strongest individual predictor
Awareness of AI tools	–1.256	0.285	0.053 (marginal)	May reflect latent skepticism
Radio media type	–1.343	0.261	0.047	Significant negative predictor
Age / Years of experience	Not significant	—	> 0.10	No predictive effect

Together, these findings suggest that innovation receptiveness is shaped by both institutional architecture and workforce competence. Digital-native organizations provide a cultural and technical environment conducive to change, but their advantage is magnified when complemented by staff with high digital proficiency and leadership that articulates a clear strategy for transformation. In contrast, organizations that lack such alignment—those with rigid structures, ambiguous innovation goals, and limited digital skill sets—are far less likely to embrace emerging technologies.

For policy and media development strategies, this implies a dual

approach: first, promoting strategic planning and digital roadmaps at the organizational level; second, investing in practical, role-specific training programs that move beyond awareness to applied proficiency. Strengthening these pillars will be essential not only for AI adoption but also for the broader process of digital restructuring across the Iranian media landscape.

Conclusion

This study provides a comprehensive assessment of the structural, demographic, and perceptual dynamics shaping the integration of AI within Iranian media organizations. Through a mixed-methods survey of 148 professionals across various media formats, the findings reveal a highly uneven digital landscape marked by generational divides, institutional inertia, and infrastructural constraints. Digital-native outlets, characterized by organizational agility and younger, technologically proficient staff, demonstrate markedly higher levels of digital readiness and innovation receptiveness than their legacy counterparts. Conversely, traditional media—especially radio and print—continue to operate within analog or semi-digitized frameworks, limiting their capacity to harness AI-driven tools and strategies.

Generational disparities emerged as a particularly salient factor, with younger professionals exhibiting significantly greater familiarity with AI tools and data-driven production workflows. These disparities are compounded by systemic gaps in training opportunities, particularly for older professionals who often occupy senior editorial or managerial roles but lack access to digital reskilling initiatives. The presence of a formal digital strategy was a consistent predictor of organizational innovation receptiveness, underscoring the importance of strategic foresight and leadership commitment in fostering technological adaptation.

The study also identifies divergent perceptions of AI's value across professional roles. While journalists emphasize editorial enhancements such as audience relevance and content quality, managers tend to prioritize operational efficiencies and revenue generation. Importantly, professionals with higher digital readiness are more likely to perceive AI as a tool for relational and audience-centered innovation, rather than as a mechanism for cost reduction or labor substitution. These perceptual differences have ethical and strategic implications for how AI is adopted, particularly in politically sensitive and economically constrained media environments.

Moreover, the analysis of monetization strategies highlights a sector still heavily reliant on legacy revenue models, with limited experimentation in subscription-based, blockchain-enabled, or

audience-supported frameworks. Structural barriers—such as sanctions, lack of digital payment infrastructure, and regulatory uncertainty—constrain innovation in this domain. However, a subset of digital-native outlets demonstrates openness to hybrid models that combine ethical monetization with editorial independence, suggesting possible pathways for future sustainability.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc.

Conflicts of interests

The authors declare that there is no conflict of interests.

Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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