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Integrating data analytics into traditional media: opportunities and strategic advantages

As traditional media transforms and adapts to the digitalisation epoch, data analysis technology becomes a critical tool for enhancing competitiveness and ensuring relevance in a rapidly changing conditions. Many news organisations are increasingly adopting data analytics strategies in order to improve the production of personalised news content and value-based advertising for more precise audience targeting. It allows them to deliver content that resonates with their viewers. To achieve this, media conducts in-depth analysis of

users' behaviour, preferences and engagement patterns, resulting in a clear understanding of their audience and, consequently, more informed decision-making. However, the way to fully integrating data analytics into traditional media is not without significant challenges. Media organisations frequently face obstacles such as inadequate technical infrastructure, limited access to skilled data professionals, and the necessity in specialised training the existing staff in order to handle data effectively. Moreover, the use of personal data raises concerns in terms of privacy and ethical standards, which necessitates a careful balancing act between leveraging data for analysing and maintaining the users' trust. Furthermore, issues related to data quality, including inconsistencies, incomplete resources and management of massive data volumes, pose additional hurdles which can complicate the accuracy and effectiveness of analytics results.

The aim of this article is to outline the strategic advantages of integrating data analytics into traditional media workflows, as well as to highlight key areas where development is crucial for the progress. The study analyses the benefits of data analytics in enhancing content relevance and organisational agility. Additionally, it provides actionable recommendations for overcoming current barriers. This research suggests ways for traditional media to strengthen their technological infrastructure, invest in the the specialists' professional development, and implement reliable privacy protocols to ground a sustainable data-driven culture. In our opinion, addressing the mentioned challenges and using the potential of data analytics can enable traditional media to achieve sustainable market growth, more easily adapt to industry changes and remain competitive in nowadays volatile and technology-driven media sphere.

Keywords: traditional media, data analytics, digitalisation, strategy.

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ІНТЕГРАЦІЯ АНАЛІТИКИ ДАНИХ У ТРАДИЦІЙНІ МЕДІА: МОЖЛИВОСТІ ТА СТРАТЕГІЧНІ ПЕРЕВАГИ

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Відповідно до того, як традиційні засоби масової інформації змінюються й адаптуються в епоху цифровізації, технологія аналізу даних стала критично важливим інструментом для підвищення конкурентоспроможності та забезпечення актуальності в умовах, що швидко змінюються. Багато новинних організацій дедалі частіше використовують стратегії аналізу даних, щоб покращити створення персоналізованого новинного контенту та реклами, а також для кращої адаптації контенту до цільової аудиторії, що дає змогу поширювати контент, який резонує з цією аудиторією. З цієї метою ЗМІ здійснюють глибокий аналіз поведінки користувачів, їхніх уподобань і моделей залучення, результатом чого є чітке розуміння своєї аудиторії та, відповідно, прийняття більш обґрунтованих рішень. Однак шлях до повної інтеграції аналітики даних у традиційні медіа не позбавлений перешкод. Медіаорганізації часто зіштовхуються з такими труднощами, як недостатня технічна інфраструктура, обмежена кількість кваліфікованих фахівців з обробки даних та потреба в спеціалізованому навчанні наявного персоналу для ефективної оброблення даних у майбутньому. Окрім того, використання персональних даних викликає занепокоєння з погляду конфіденційності й дотримання етичних стандартів, що сприяє збереженню балансу між використанням даних для аналізу та збереженню довіри користувачів. Також проблеми, пов'язані з якістю даних, зокрема їхньою невідповідністю, обмеженістю ресурсів і керуванням великими обсягами даних, створюють додаткові перешкоди, які можуть вплинути на точність та ефективність результатів аналітики.

Мета цієї статті полягає у виокремленні стратегічних переваг інтеграції аналітики даних у традиційні робочі процеси медіа та окресленні ключових сфер, розвиток яких має вирішальне значення. Проаналізовано переваги аналітики даних у підвищенні релевантності контенту та гнучкості організації процесів у ЗМІ, а також надано рекомендації щодо подолання наявних перешкод. Запропоновано шляхи для традиційних медіа до зміцнення їхньої технологічної інфраструктури,

інвестування в розвиток майстерності фахівців, а також упровадження надійних протоколів конфіденційності для побудови сталої культури управління даними. Вирішення окреслених проблем і використання потенціалу аналітики даних, на нашу думку, дасть змогу традиційним медіа забезпечити стале зростання ринку, допоможе легше адаптуватися до змін у галузі та залишатися конкурентоспроможними в сучасному нестабільному й технологічно орієнтованому медіасередовищі.

Ключові слова: традиційні медіа, аналітика даних, цифровізація, стратегія.

Introduction

As the news industry enters an epoch of rapid digital change, traditional media (such as newspapers, television, etc.) are gradually being replaced by various digital platforms. Users' news consumption habits have changed significantly. More and more people tend to obtain news information through the Internet, which has brought challenges to traditional media with audience loss and declining advertising revenue (Napoli, 2011).

In this shift, data analytics helps newsrooms meet the challenges in a better way. By deeply analysing the users' behaviour data, newsrooms are able to deliver news content that is personalised to different audience segments. This not only helps in increasing the users' engagement, but also makes advertising more targeted (Wu et al., 2021). The successful application of personalised recommendation systems has shown that data-driven decision-making is essential to optimise news distribution (Li et al., 2010).

Data analytics has brought new business opportunities to traditional media. Data-based advertising can achieve precision marketing and improve the return on advertisers' investment. With the further development of artificial intelligence and machine learning technologies, the role of data analytics in the production and distribution of news content can become even more important. In future, traditional media must pay more attention to the application of data analysis in order to remain sustainable in the highly competitive news market.

Analysis of recent research and publications

Research publication activity on integrating data analytics into traditional media has gained notable momentum, particularly as media companies seek to harness data insights for audience engagement and content personalisation. Bibliometric analysis of recent tendencies reveals a shift from basic data usage to more sophisticated analytics, including machine learning and predictive models. This shift supports targeted content delivery, enabling traditional media outlets to meet the expectations of audiences accustomed to personalised experiences from digital platforms.

Several studies highlight the interdisciplinary nature of this research, showing contributions from fields like data science, journalism and marketing. For instance, the growing use of audience data analytics in news-

rooms has led researchers to study both the operational impacts and the ethical implications, including privacy and data governance concerns. These studies suggest that creating a “data culture” within media organisations – wherein editors, journalists and analysts alike understand and leverage audience metrics – is essential for sustained influence.

The publication trends also reflect an increased focus on metrics that go beyond traditional page views or reach, with engagement metrics like time spent and content interactions gaining popularity as indicators of true audience connection. Studies have documented challenges in aligning these new metrics across platforms, often leading to fragmented insights that complicate effective decision-making.

It is important to analyse some key findings from recent research and publications on this issue.

Recent research has highlighted several critical findings on the integration of data analytics in traditional media, uncovering significant opportunities and challenges in the digital transformation of the media sector:

1. Audience insights and content personalisation. A key finding across studies is that data analytics enables media companies to understand audience preferences on a granular level, fostering deeper engagement and customisation. Traditional media companies can move from generic and broad programming to content tailored to specific viewers’ demographics and interests. For example, advanced analytics allow media outlets to segment audiences more effectively. It optimises content delivery and enhances personalisation. A group of researchers, including N. Henke, J. Bughin, M. Chui, J. Manyika, T. Saleh, B. Wiseman and G. Sethupathy (2016), emphasises that the capacity to leverage real-time data enables media firms to adapt quickly to audience behaviours, delivering targeted experiences that increase the viewers’ loyalty.

2. Operational and cost efficiency. Research also points to operational efficiencies as a major advantage. Traditional media companies using data analytics can streamline workflows and cut costs through automation and improved resource allocation. Organisations that reach higher levels of data maturity, progressing from descriptive to prescriptive analytics, see improved operational efficiency, lower costs and more strategic use of resources. This is particularly beneficial for media companies facing rising content production and distribution expenses.

3. Challenges in data infrastructure and privacy concerns. Although the benefits are substantial, research underscores several challenges. Many traditional media companies are grappling with outdated data infrastructures that prevent them from fully harnessing analytics. Organisations may face data silos, inconsistent data standards, and legacy systems that impede seamless data integration. Additionally, as data usage grows, so do concerns around privacy and data security. Balancing the necessity in analytics with

compliance to privacy laws and ethical standards remains a complex task, especially as media companies collect more consumer data than ever before.

The aim of the article

The aim of this article is to analyse the challenges and opportunities faced by traditional media; to underscore the strategic advantages of integrating data analytics into traditional media workflows; to highlight key areas where development is crucial for future progress.

The main part

The rise of data analytics in the news industry

With the rapid development of digital technology, data analysis technology has gradually become a core tool in the news industry. Earlier, news production relied more on the experience and intuition of journalists, but now it is increasingly driven by big data and the Internet. Data analytics not only optimises the news production process, but also helps news organisations in better understanding the audience's needs and predict news consumption tendencies, further improving the relevance and effectiveness of content (Schlesinger & Doyle, 2015).

Basic concepts of data analysis

Data Analytics collates and analyses large amounts of data in order to identify patterns and trends. It includes not only basic statistical analysis and data visualisation, but also advanced techniques such as machine learning and artificial intelligence. In journalism, data analytics can help newsrooms monitor the audience's behaviour and optimise stories based on real-time data. For example, by analysing metrics such as clicks and read time, news organisations can quickly make content optimisation decisions to improve the effectiveness of their content (Fink & Anderson, 2015).

The application of data analysis in news

Data analytics was initially used for simple click-through rate and read counts. Still, as the technology has evolved, it has been applied to more complex areas such as personalised news recommendations and the audience's behaviour prediction. By analysing the users' browsing history, click preferences and social media interactions, newsrooms are able to provide the audience with customised news content that increases its stickiness and engagement. In addition, data analysis can help news organisations in predicting news hotspots, quick adjusting the direction of coverage and improving the breadth and depth of news dissemination (Cherubini & Nielsen, 2016).

The influence of data analysis on news dissemination

Data analytics not only dramatically improves the ability to personalise news content, but also enables news organisations to flexibly adjust their reporting strategies by monitoring the audience's behaviour in real time. By analysing the users' click behaviour, news organisations can predict which

news headlines are more likely to appeal to readers and optimise headlines in order to improve communication effectiveness. This data-driven communication method not only increases the interactivity of news, but also improves the accuracy of advertising (Thurman & Schifferes, 2012).

The rise and development of data analytics in journalism

Over the last few decades, the production model of journalism has undergone significant changes. From the early days of print media, to radio and television, to nowadays digital news, the mode of news dissemination has gradually shifted from one-way communication to diversification and personalisation. Data analytics has played a key role in this transformation, helping news organisations improve delivery by analysing the audience's preferences to deliver personalised content that is more effective.

The future of data analytics

In future, the application of data analysis in the news industry is promising. With the further development of artificial intelligence and deep learning technology, data analytics will drive the automation of the news production and distribution process. Not only are news organisations better able to understand the needs of their audiences, but they are also able to anticipate news tendencies in advance and prepare for stories (Carlson, 2015). In addition, with the 5G technology popularisation, the combination of real-time news feed and data analysis will further improve the accuracy and efficiency of news dissemination (Habibi et al., 2019).

Challenges and opportunities faced by traditional media

As the news industry rapidly shifts to a digital and data-driven model, traditional media is facing unprecedented challenges. Traditional media such as newspapers, radio and television used to be the dominant force in the news industry. Still, with the rapid development of digital technology, these media have gradually lost their market dominance. The main challenges faced by traditional media in the digital age will be discussed, and how data analytics technologies can bring new opportunities for them will be analysed.

1. Audience loss and changes in news consumption habits.

With the popularity of social media and news apps, especially young audiences, who are increasingly relying on digital platforms for news, traditional media are facing a serious problem of audience churn. Compared to traditional media, digital platforms can provide instant news feeds and personalised recommendations, attracting a large number of users. According to statistics, more than 70% of young users get their news through social media. At the same time, the frequency of traditional newspapers and TV has decreased significantly (Newman et al., 2021). This shift has not only affected the audience base of traditional media, but has also had a significant influence on their advertising models.

2. Decline in advertising revenue.

Advertising revenue has long been the main economic pillar of traditional media. However, with the rise of the digital market, advertisers are shifting their budgets to platforms that provide detailed data on their audiences and monitor ad performance. Traditional media are unable to provide real-time audience analysis and advertising effect monitoring, gradually losing the market share, and advertising revenue has decreased significantly (Bangah & Ballhaus, n.d.). In contrast, digital platforms can achieve precise advertising through data analysis. It can bring a higher return on investment (ROI) to advertisers.

3. Technology and talent bottlenecks.

Traditional media are facing the dual challenges of technology and talent in the process of digital transformation. Digital transformation requires advanced data analytics platforms and press release automation systems. Many traditional media organisations lack the technical infrastructure. There is a shortage of related technical talent. News editors and journalists often lack the expertise of data analysis, which makes it difficult for them to adapt to data-driven news production (Paynter et al., 2024).

4. Opportunities presented by data analytics.

Data analytics presents significant transformation opportunities for traditional media in spite of the challenges. By analysing the users' behaviour data, traditional media can provide personalised content that is more in line with the needs of the audience, thereby, increasing the users' engagement and loyalty. In addition, data analysis also provides advertisers with more detailed audience data, making advertising more accurate. It helps traditional media to increase advertising revenue and find new revenue models.

5. Enhancing users' stickiness and optimizing advertising revenue.

With the help of data analysis, traditional media can not only push customised news content to the audience, but also make personalised recommendations according to the users' preferences and increasing the stickiness of the audience. At the same time, data analysis technology helps traditional media to improve the effectiveness of advertising. With detailed user data, advertisers can achieve more accurate advertising. As a result, the traditional media can earn more ad revenue.

Strategic advantages of data analysis

In today's highly competitive news industry, data analytics gives newsrooms a strategic advantage. Whether it's the production of news content, advertising, or insights into the users' behaviour, the application of data analytics has driven the transformation of these key links. Here are the main strategic advantages of data analytics technology in the news industry.

1. Personalised content production.

Through data analytics, newsrooms can gain a deeper understanding of the audience's interests and behaviours to deliver customised news content.

By analysing readers' historical data, news organisations can recommend the most relevant news stories for each user. Personalised recommendation systems not only increase page views, but also significantly increase the users' dwell time and frequency of interactions (Thurman & Schifferes, 2012). This enables news content to reach the target audience precisely and expand the reach and impact of the news.

2. Precision of advertising.

Advertising revenue is one of the core revenue sources for news outlets. Data analytics makes advertising more accurate and efficient. By analysing the users' browsing data, interest tags, geolocation, etc., news organisations can provide advertisers with precise solutions. Targeted advertising not only increases click-through rates, but also significantly making bigger the return on investment (ROI) of advertisers, bringing more revenue opportunities to publishers.

3. Users' behaviour analysis.

Data analytics allows news organisations to perform detailed analyses of the users' behaviour, including their browsing habits, click preferences and time on pages (Chen, 2024). With this data, newsrooms can continuously adjust their content production strategies and push strategies to attract and retain more users. For example, the users' behaviour analytics can help predict news topics that they are likely to be interested in and adjust content release schedules to improve their experience and platform stickiness.

4. Risk control and decision support.

Data analytics also provides news organisations with powerful tools for risk control and decision support. By monitoring the effectiveness of news dissemination in real time, news organisations can quickly identify potential risks and take action before they occur. Data analytics can also predict future news buzz and help news organisations get ahead of the curve. At the same time, it provides data support to management to help optimise resource allocation and content strategy to improve competitiveness in the market.

Challenges in implementing data analysis

While data analytics offers many strategic advantages to the news industry, newsrooms face a number of hurdles in their practical application. Technical limitations, talent shortages and data privacy concerns are all key factors hindering the widespread adoption of data analytics technologies. If these issues are not properly addressed, the full potential of data analytics will be difficult to realise.

1. Inadequate technical infrastructure.

The efficient operation of data analysis requires an advanced technological infrastructure. However, many traditional news organisations are relatively backward in terms of technology and have difficulty applying sophisticated data analysis tools (Napoli, 2011). In contrast, digital news platforms typically have robust technical architectures that are capable of handling

large-scale audience data. The technological lag of traditional media organisations limits their ability to improve the efficiency of news production and dissemination, and hinders competition with digital platforms.

2. Shortage of data analytics talent.

The demand for data analytics talent in journalism far outstrips the supply. Many traditional news organisations lack the expertise to data analytics and tech companies. So, digital platforms are better able to attract these highly skilled talents. As a result, news organisations are faced with a competitive competition for talent, unable to quickly assemble a professional team to drive the adoption of data analytics technology. To address this issue, media organizations need to increase training and invest in technology to become more competitive.

3. Data privacy and ethical issues.

With the proliferation of data analytics technologies, news organisations are facing increasing privacy and ethical challenges when collecting and using user data (Chen, 2023). Especially in countries and regions where laws are more strictly grounded, the protection of the users' privacy has become particularly important. News organisations need to find a balance between data analytics and privacy protection to ensure that they do not infringe on the legitimate rights and interests of their users. In addition, personalised recommendation systems sometimes lead to the "information cocoon effect", which limits the users' vision to the content pushed by the algorithm, weakening the breadth and diversity of news dissemination.

4. Data quality and access challenges.

Effective data analysis relies on high-quality data, but many news organisations have deficiencies in data collection and processing, resulting in data integrity and accuracy not being guaranteed (Nechushtai, 2018). Low-quality data not only affects the accuracy of the analysis results, but also directly weakens the effectiveness of news organisations in news content optimising and advertising decisions. To improve the effectiveness of data analysis, news organisations must first ensure the accuracy and completeness of the data they capture.

Future development and suggestions

As technology continues to evolve, newsrooms must continue to improve their data analytics capabilities. In particular, the application of artificial intelligence and machine learning will further help news organisations optimise their ability to process data and predict news tendencies. These technologies are capable of providing more relevant and timely reporting in an information-exploding environment. In addition, it is important to establish an internal data management system to ensure the quality and security of data. Partnering with technology companies or data service providers can increase the integration and adoption of these technologies.

The shortage of data analytics talent is one of the major challenges facing the news industry. To address this, newsrooms should strengthen data analytics training for their staff and empower traditional reporters and editors with data tools. At the same time, news organisations should also enhance their technical capabilities by attracting external data analytics talent (Heravi & Lorenz, 2020). Partnering with universities and research institutes to leverage their resources to fill the talent shortage in data analytics would be an effective solution.

Against the backdrop of growing concerns about data privacy, news organisations should ensure the legitimacy and compliance of data analytics (Calo, 2013). News organisations should take effective measures in order to handle user data and ensure that data is anonymised. This processing method can not only ensure the effectiveness of data analysis, but also reduce the risk of the users' privacy leakage and enhance public trust.

While personalised news recommendation systems have led to higher user stickiness for newsrooms, they can also lead to information cocooning, where users can only receive limited information that matches their preferences. News organisations can improve the users' experience while reducing information bias by optimising recommendation algorithms to ensure that personalised content coexists with diverse news stories.

Based on data analytics, targeted advertising and paid subscription services will become an important source of revenue for news organisations. By deeply analysing the users' spending habits, newsrooms can provide them with more personalised news content and deliver higher ROI to advertisers. At the same time, news organisations partnering with digital platforms can further explore multi-channel content distribution and monetisation models.

Conclusions

Today, the news industry is in the midst of a profound digital transformation. Data analytics technology offers unprecedented opportunities for news organisations. Not only does it help organisations in producing news content more accurately and optimising ad delivery, but it also enables them to better understand audience needs and improve their stickiness. However, in spite of the tremendous advantages of data analytics technology, news organisations still face a series of difficulties in adopting it, such as insufficient technical infrastructure, shortage of data analytics talent, privacy protection challenges and data quality control issues.

Looking ahead, news organisations need to further invest in data analytics technology and, additionally, continue to improve their technical capabilities. At the same time, more talent must be developed in the sphere of data analytics in order to cope with the changing demands of the news market. By partnering with technology companies and academic institutions,

newsrooms are able to share cutting-edge technology and talent to ensure a competitive edge in the future news ecosystem. In addition, privacy protection and ethics issues are also important issues that cannot be ignored in future. News organisations should conduct data analysis within a legal and compliant framework to ensure public trust in the news industry.

In future, the news industry will rely more on data-driven decision-making. Personalised news push and precision advertising will gradually become the mainstream of the industry. At the same time, news organisations should explore more innovative business models and use data analytics to tap into new revenue streams. By addressing these challenges and leveraging the strategic benefits of data analytics, the journalism industry is poised to be more successful in its digital transformation journey.

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