

Original Paper

Exploration of Digital Media Integration and Development Path under Internet + Environment

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Abstract

With the continuous popularization of the Internet and the ongoing development of digital technology, the application of digital media in the environmental field is becoming increasingly widespread. This article explores the development path of digital media integration in the Internet Plus environment and proposes future trends and challenges for digital media in the environmental field. Through research and analysis, this article believes that the development of digital media integration in the environmental field should focus on the following aspects: strengthening technological research and development to enhance the application level of digital media in environmental monitoring, early warning, and governance; strengthening information construction to enhance the role of digital media in environmental information sharing, dissemination, and communication; strengthening talent training to cultivate interdisciplinary talents with backgrounds in environmental science and digital technology, and promote innovation and application of digital media in the environmental field. This article aims to provide references and insights for the development of digital media in the environmental field, promote the deep integration of digital media and environmental science, and make greater contributions to the cause of environmental protection.

Keywords

Internet + Environment, digital media, convergence, development path, environmental protection

1. Introduction

With the continuous progress of science and technology and the continuous development of society, environmental problems have become a global problem. And digital media is an emerging form of media, which has the characteristics of fast information transmission, wide dissemination range and

strong interactivity, which has become an important means of environmental governance and protection. The development mode of Internet + Environment also provides a broad space and opportunity for the application of digital media in the field of environment. This paper aims to explore the development path and future trend of digital media in the context of Internet + environment, with a view to providing some ideas and reference for the application and innovation of digital media in the field of environment.

2. Current Status of Digital Media Applications in the Environmental Field

2.1 Environmental Monitoring

Digital media technology can realize real-time collection, transmission and analysis of environmental data and improve the precision and efficiency of environmental monitoring. For example, the use of digital media technology can realize real-time monitoring and analysis of environmental indicators such as air, water quality, soil etc., quickly obtain environmental data, and realize the tracking and tracing of environmental pollution sources. In addition, digital media technology can also realize the visualization display of environmental data, which is convenient for environmental managers and the public to understand the environmental situation (Yusong, 2023).

2.2 Environmental Early Warning

Digital media technology can realize real-time assessment and early warning of environmental risks and improve the ability to manage environmental risks. For example, the use of digital media technology can realize real-time monitoring and analysis of environmental events, provide rapid early warning of environmental risks, and disseminate early warning information to a wider audience through channels such as online platforms and social media, so as to improve the public's awareness of and ability to respond to environmental risks.

2.3 Environmental Information Sharing

Digital media technologies can enable the sharing and exchange of environmental information and increase the transparency and openness of environmental information. For example, the establishment of environmental information platforms and online communities enhances the sharing and exchange of environmental information, facilitates the public's understanding of environmental policies and measures, and increases public awareness of and participation in environmental issues. In addition, digital media technology can enable the visual display and analysis of environmental information, facilitating the public's understanding of environmental conditions and trends.

2.4 Environmental Awareness-raising and Education

Digital media technology can realize the innovation and enhancement of environmental protection publicity and education, and improve the effect of environmental protection publicity and public participation. For example, virtual reality, augmented reality and other technical means are utilized to

create a more vivid and intuitive environmental experience and improve the attractiveness and influence of environmental protection publicity. In addition, digital media technology can also spread environmental protection information to a wider audience through channels such as network platforms and social media, realizing the all-media and diversification of environmental protection publicity (Xueting, 2023).

3. Challenges of Digital Media in the Environmental Field

3.1 The Digital Divide

The Digital Divide refers to the disparity and imbalance in the access to and utilization of digital technology and information between different regions and groups. It encompasses differences in information acquisition, utilization, and communication. The Digital Divide is a global issue, particularly severe in developing countries and impoverished areas, posing significant challenges to the development of environmental protection and governance. It greatly impacts the dissemination and application of digital media in the environmental field. Firstly, the Digital Divide leads to an imbalance in information acquisition and dissemination. In the digital information age, information plays a crucial role in accessing and disseminating knowledge on environmental protection and governance. However, the Digital Divide prevents certain regions and groups from accessing and sharing relevant information, thereby affecting the effectiveness of environmental protection and governance. Secondly, the Digital Divide affects the level of public participation in environmental protection and governance. The public plays a vital role in these areas, but the Digital Divide hinders the involvement of certain regions and groups in the processes of environmental protection and governance, diminishing the extent and depth of public engagement. Furthermore, the Digital Divide results in incomplete and inaccurate environmental data. Digital technology can enhance the collection and analysis of environmental data. However, the Digital Divide restricts the ability of certain regions and groups to fully access and utilize environmental data, thus impacting the effectiveness of environmental governance (J. J. H., R, 2021). Lastly, the Digital Divide exacerbates the inequity of environmental issues. Environmental problems are often correlated with socio-economic status, education level, and cultural background. The Digital Divide prevents certain regions and groups from accessing and utilizing relevant information and technologies, further disabling them in addressing environmental issues and escalating the unfairness of environmental problems. To address the Digital Divide, a series of measures are necessary. Firstly, governments need to enhance investments in digital technology and information infrastructure, particularly in impoverished areas and developing countries. They should implement targeted policies and measures, strengthen digital infrastructure construction, improve digital literacy and skills, and promote the dissemination and application of digital technology and information. Secondly, the involvement of social organizations and businesses needs to be reinforced. These entities can play a

crucial role by providing support in terms of funding and technology, helping impoverished areas and vulnerable groups access and utilize digital technology and information, thereby narrowing the Digital Divide. Lastly, international cooperation needs to be strengthened. The Digital Divide is a global issue that requires collective efforts from the international community. Developed countries can offer technical and financial support to assist developing countries and impoverished areas in bridging the Digital Divide. This will promote the dissemination and application of digital technology and information, advancing the cause of environmental protection and governance.

3.2 Information Asymmetry

Information Asymmetry refers to the situation in which one party possesses more and accurate information during the process of information exchange, while the other party lacks or misunderstands the information. In the environmental field, information asymmetry primarily refers to the incompleteness, inaccuracy, and lack of transparency of environmental information. This presents significant challenges to environmental monitoring and governance, as well as affecting public awareness and participation in environmental issues. Firstly, information asymmetry affects the effectiveness of environmental monitoring and governance. Incomplete, inaccurate, and non-transparent environmental information results in incomplete and inaccurate monitoring and governance, thereby impacting the effectiveness of environmental protection and governance. For example, if a company does not disclose its emissions, regulatory authorities may struggle to detect and address pollution issues promptly, leading to incomplete environmental governance. Secondly, information asymmetry affects the level of public participation in environmental protection and governance. The public plays a vital role in environmental protection and governance. However, if the public lacks understanding or has inaccurate information about the environment, they are less likely to effectively participate in environmental protection and governance processes. For instance, if the public is unaware of a company's environmental emissions, it becomes challenging to supervise and provide feedback to the company, thereby diminishing public participation. Furthermore, information asymmetry also impacts the effectiveness of environmental advocacy. The purpose of environmental advocacy is to raise public awareness and understanding of environmental issues. However, if environmental information is incomplete, inaccurate, and non-transparent, it becomes difficult to conduct effective environmental advocacy. For example, if a region's environmental quality report is not truthful, it hampers the use of environmental advocacy to enhance public awareness and understanding of environmental issues. To address the issue of information asymmetry, a series of measures is required. Firstly, governments need to establish relevant laws and policies to enhance the transparency and openness of environmental information. Governments can enforce companies to disclose environmental information and rigorously regulate them, thereby safeguarding the public's right to know and participate. Secondly, the capacity and technical expertise of environmental

regulatory agencies need to be strengthened. These agencies should possess advanced monitoring technologies and analytical capabilities to access and analyze environmental information accurately and promptly, ensuring the effectiveness of environmental monitoring and governance. Additionally, it is essential to enhance environmental education and popularize scientific knowledge among the public. The public needs to comprehend the basic knowledge of environmental issues and relevant policies and regulations, thereby improving their awareness and understanding of environmental information and enhancing their participation in environmental protection and governance (Yin & Zheng, 2021). Lastly, the supervision role of social organizations and media needs to be strengthened. They can promote the disclosure of environmental information by companies and governments through public reporting and public oversight. This drives the realization of information transparency and openness while facilitating public participation in environmental protection and governance processes.

3.3 Network Security

Cybersecurity is a highly important issue in the field of digital media. The application of digital media in the environmental sector requires data transmission and communication through the internet and other digital technologies, which calls for the assurance of network security. Network security concerns include data breaches, cyber attacks, and malicious software, all of which may result in the tampering, destruction, or leakage of environmental data, thereby impacting the effectiveness of environmental management and public participation. Therefore, strengthening network security safeguards and technological protection is essential for the application of digital media in the environmental field. Firstly, there is a need to enhance the formulation and implementation of network security laws and regulations. Network security laws and regulations can standardize the safeguarding of network security, penalties for cyber attacks, and other related aspects, consequently elevating the level of network security protection. Governments can oversee and ensure network security through legislation, administrative orders, and other means. Secondly, the research and application of network security technologies need to be strengthened. Network security technologies include encryption algorithms, security protocols, firewalls, intrusion detection systems, among others, which are effective in safeguarding network security. Governments and businesses should intensify research and application of network security technologies, aiming to enhance the level of network security protection. Furthermore, network security management and monitoring need to be reinforced. Enterprises and governments should establish comprehensive network security management systems to exercise complete monitoring and management of network security. Additionally, the monitoring and prevention of cyber attacks and malicious software need to be intensified, warranting the prompt detection and response to network security threats. Moreover, employee awareness and training on network security need to be enhanced. Employees play a crucial role in network security, and they should possess fundamental knowledge and skills to recognize and address network security threats. Enterprises and

governments can improve employee awareness and skill levels through network security training and education, thereby increasing the level of network security protection. Lastly, international cooperation and information sharing need to be strengthened. Network security is a global issue that requires concerted efforts from the international community to tackle. Governments and businesses should enhance cooperation with other countries and regions to collectively address network security threats. Additionally, there is a need to enhance the sharing of network security information, ensuring the timely acquisition and dissemination of network security information and technologies, ultimately enhancing the level of network security protection (Huimin, 2022).

3.4 Data Management and Privacy Protection

The application of digital media in the environmental field requires extensive data management and processing, which includes the collection, transmission, storage, processing, and analysis of environmental data. Additionally, it is necessary to protect the privacy rights of the public and prevent the misuse or leakage of environmental data. Therefore, the application of digital media in the environmental field needs to strengthen data management and privacy protection measures to ensure the legality and confidentiality of environmental data. Firstly, it is necessary to establish a comprehensive data management system. The data management system should include specifications and processes for data collection, storage, processing, and analysis, ensuring the legality, accuracy, and integrity of environmental data. Additionally, the data management system should clearly define the scope and permissions of data usage, preventing data misuse or leakage. Secondly, data security safeguards need to be enhanced. Data security measures include data encryption, access control, backups, and more, effectively protecting the security and reliability of environmental data. Governments and businesses need to strengthen the research and application of data security safeguards, improving the level of data security protection. Additionally, it is important to enhance the protection of data privacy. In the application of digital media, the privacy rights of the public must be respected and protected. Governments and businesses should formulate relevant privacy protection policies, clearly defining the scope and permissions of data usage to safeguard the privacy rights of the public. Moreover, it is necessary to enhance the monitoring and handling of data privacy, promptly identifying and addressing issues such as data privacy breaches. Furthermore, an open and transparent data sharing mechanism needs to be established. Data sharing can facilitate a more comprehensive and accurate acquisition and analysis of environmental data, but it also requires safeguards for public privacy rights and data security. Governments and businesses need to establish an open and transparent data sharing mechanism, clearly defining the scope and permissions of data sharing to ensure public privacy rights and data security. Lastly, it is crucial to strengthen public awareness of data security and privacy. The public should understand their data rights and privacy, protecting personal data security and privacy. Additionally, there is a need for public awareness regarding data management and privacy protection

measures in the application of digital media in the environmental field, promoting public trust and support for digital media.

4. Pathways for Digital Media in the Environmental Field

4.1 Environmental Data Acquisition and Processing

The application of digital media in the environmental field involves the collection, processing, and analysis of environmental data. Environmental data primarily includes information about air quality, water quality, soil conditions, noise levels, and other related aspects. Digital media can collect environmental data through sensors, remote sensing technologies, satellite data, and other means. Subsequently, through data processing and analysis, it can derive insights about the environmental conditions and trends. In the future, the application of digital media in the environmental field will emphasize finer and more diverse environmental data. Utilizing technologies such as big data and artificial intelligence, it will enable in-depth exploration and analysis of environmental data, providing more precise data support for environmental management and decision-making. Digital media can achieve real-time, continuous, and high-resolution data collection by employing sensors, remote sensing technologies, and similar techniques. This enhances the spatiotemporal resolution and accuracy of environmental monitoring. For instance, real-time air quality data can be monitored at different locations through air quality monitoring stations, while remote sensing techniques can provide data on vegetation coverage and water bodies within a region. These data can assist environmental management departments in responding promptly to environmental issues and making informed decisions. Furthermore, through data processing and analysis, digital media can derive insights about environmental conditions and trends. For example, data analysis can reveal the changing trends in air quality in a specific area and establish correlations with factors such as population density and industrial activities. By employing algorithms such as data mining and machine learning, environmental data can be deeply analyzed and predicted, providing more accurate data support for environmental management and decision-making. Looking ahead, the application of digital media in the environmental field will focus more on the refinement and diversification of environmental data. For instance, artificial intelligence technologies can enable intelligent recognition and classification of environmental data, thereby facilitating automated processing and analysis. Digital media can also integrate different types of environmental data to form a more comprehensive and three-dimensional picture, thereby providing comprehensive data support for environmental management and decision-making.

4.2 Environmental Monitoring and Early Warning

The application of digital media in the environmental field can help achieve environmental monitoring and early warning. Digital media can utilize sensors and remote sensing technology to monitor and

collect data on the environment in real time. Then, through data analysis and technologies such as artificial intelligence, it can achieve environmental early warning and prediction. In the future, the application of digital media in the environmental field will focus more on intelligent and automated environmental monitoring and early warning, realizing intelligent identification, analysis, and prediction of the environment through digital technology, and improving the accuracy of environmental monitoring and early warning. Digital media can utilize means such as sensors and remote sensing technology to monitor and collect data on the environment in real time, achieving real-time and continuous data, and improving the spatial-temporal resolution and accuracy of environmental monitoring. For example, air quality monitoring stations can monitor air quality data at different locations in real time, and remote sensing technology can provide data on vegetation coverage and water coverage within an area. These data can help environmental management departments respond promptly and make decisions regarding environmental issues. Digital media can achieve environmental early warning and prediction through data analysis and technologies such as artificial intelligence. For example, trends in air quality changes in a certain area can be determined through data analysis, as well as their correlation with factors such as population density and industrial activities. By employing algorithms such as data mining and machine learning, deep analysis and prediction of environmental data can be conducted, enabling environmental early warning and prediction.

4.3 Environmental Awareness and Education

The application of digital media in the environmental field can help achieve environmental promotion and education. Digital media can utilize multimedia technology and online platforms to disseminate and educate on environmental knowledge and skills. Through various forms such as text, images, audio, and video, digital media can convey environmental knowledge to a wider audience, thereby increasing public awareness and capacity for environmental action. In the future, the application of digital media in the environmental field will focus more on diversifying and interactive environmental promotion and education. By employing innovative digital media tools and interactive environmental education models, public engagement and the effectiveness of environmental protection can be enhanced.

4.4 Environmental Governance and Decision-making

The application of digital media in the environmental field can help achieve environmental governance and decision-making. Digital media can utilize technologies such as big data and artificial intelligence to conduct in-depth analysis and mining of environmental data, providing more accurate data support for environmental governance and decision-making. Digital media can also employ virtual reality technology and simulation techniques to replicate environmental changes and governance effects, providing visual and intuitive support for environmental governance and decision-making. In the future, the application of digital media in the environmental field will focus more on the deep integration of digital technology and environmental governance, achieving intelligent and sustainable environmental

governance and decision-making through digital technology.

4.5 Environmental Public Participation

The use of digital media in the environmental field can help to realize environmental public participation. Digital media can utilize platforms such as the Internet and social media to realize an interactive mode of public participation in environmental actions and environmental governance. Digital media can allow the public to participate in the process of environmental governance and decision-making through online questionnaires, online voting, online opinion collection, etc. to improve public participation and satisfaction. The future application of digital media in the field of environment will pay more attention to the deep integration of digital technology and public participation, and realize the intelligence and sustainability of public participation through digital technology.

4.6 Challenges of Digital Media in the Environmental Field

The application of digital media in the environmental field still faces some challenges. In terms of environmental data collection and processing, digital media still needs to address issues of data accuracy and reliability. In terms of environmental monitoring and early warning, there is still a need to solve the challenges of intelligence and automation in monitoring methods and early warning models. In terms of environmental promotion and education, there is still a need to address issues of content innovation and dissemination effectiveness. In terms of environmental governance and decision-making, there is still a need to address the deep integration of digital technology and environmental governance. In terms of public participation in the environment, there is still a need to address the deep integration of digital technology and public engagement.

5. Conclusion

In the context of the Internet + environment, the integration and development of digital media in the field of environment hold significant importance. The application of digital media enables us to achieve intelligent environmental monitoring and data processing, enhancing the accuracy and efficiency of environmental governance and decision-making. Additionally, digital media can help promote environmental knowledge and increase public awareness and engagement in environmental conservation efforts. However, the application of digital media in the environmental field still faces several challenges, including data accuracy and reliability, the intelligence and automation of monitoring methods and early warning models, content innovation and dissemination effectiveness, the deep integration of digital technology and environmental governance, and the deep integration of digital technology and public participation. To address these challenges, we need to continue promoting the cross-integration of digital technology and the environmental field, as well as strengthen research, development, and innovation in their application. Collaboration among government, enterprises, and

society is essential to drive the application and development of digital media in the environmental domain. We can establish more robust data collection and processing systems to enhance data accuracy and reliability. By incorporating technologies such as artificial intelligence and machine learning, we can achieve intelligent monitoring and early warning, continuously improving models and algorithms for greater accuracy and reliability. To enhance environmental promotion and education, we should encourage innovative content and dissemination approaches, leveraging the strengths of digital media to maximize impact and appeal. In addition, we should intensify the integration of digital technology and environmental governance, utilizing tools such as virtual reality and simulation techniques to provide visual and intuitive support for the formulation of environmental governance strategies and decisions. Furthermore, a greater emphasis should be placed on public engagement, utilizing digital technology to enhance public participation and constructing digital platforms for environmental governance and decision-making to foster proactive involvement in environmental protection. In conclusion, the integration and development of digital media in the environmental field hold immense potential in the era of Internet+. Through continuous exploration and innovation, we can overcome challenges and maximize the potential of digital media in environmental protection, contributing to the building of a sustainable and beautiful planet.

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