ORIGINAL RESEARCH ARTICLE

Cultural communication based on image processing in multimedia network environment

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ABSTRACT

In the process of uploading pictures of cultural products under the multimedia network environment, image processing technology is indispensable for page production and picture design, and image processing plays an indispensable role. **Purpose:** The use of image processing technology enriches the means of cultural communication, and also improves the visual effect and dissemination rate of cultural communication to a certain extent, and produces the effect of deepening people's hearts. **Methods:** This paper firstly focuses on the problems and development trends in cultural communication, and uses image processing technology in the multimedia network environment to analyse the effects of cultural communication, and secondly focuses on the application of multimedia network and image processing in cultural communication. Finally, the four-degree evaluation method is used to evaluate the effect of cultural communication. **Results:** The final results show that with the use of image processing techniques, the rate of cultural dissemination in various cultural fields can reach 50% to 75%. **Conclusion:** The research on cultural communication based on image processing can deepen the understanding of cultural communication in the multimedia network environment, expand the application of image processing technology in the field of cultural communication, analyse the role and influence of images in cultural communication, and promote the cross-fertilization of cultural communication and image processing, which is of great practical application and academic value.

Keywords: cultural communication; multimedia network; image processing; four-degree evaluation method

1. Introduction

In today's era of globalization, the importance of cultural communication has become more and more prominent. Cultural communication can promote exchanges and understanding among different cultures, as well as the coexistence and development of cultural pluralism. However, cultural communication also faces a series of challenges, such as language differences, cultural misunderstandings, value conflicts and so on. Image processing technology plays an important role in cultural communication as a powerful tool. Firstly, images are intuitive and distinctive, and can break through language barriers to directly convey cultural information and improve the receiver's understanding and acceptance. Secondly, image processing technology can enrich the form and content of cultural communication and stimulate the aesthetic emotion and creativity of the receivers by enhancing the expressive power and artistic infectivity of images. In addition, image processing technology can help receivers deeply understand and experience culture and promote cross-cultural communication by analyzing

cultural symbols and elements in images. We aim to explore the methods and effects of cultural communication based on image processing, and propose practical methods and strategies to promote cross-cultural communication and understanding through in-depth analyses of the application of image processing technology in cultural communication.

Culture develops and advances due to constant investigation of newly suggested cultural concepts. Lehrner and Yehuda discussed how communication is impacted by cultural trauma, emphasizing the importance of cultural stories and the opportunity for adaptation and resilience[1]. Theoretical and empirical research on cultural intelligence published in psychology, education, management, and international business journals between 1973 and 2002 were thoroughly evaluated by Ott and Michailova in 2015[2]. According to Beugelsdijk and Welzel, who believed that cross-border research on cultural variances across time and location transcends several disciplines[3], the significance of their concepts varies throughout different academic fields. Curtis et al. proposed a definition of cultural security and believed it is more suitable for achieving the goal of health equity. He discussed the unintended consequences of a narrow or limited understanding of cultural competence and suggested the importance of a broader conceptualization of these terms[4]. Nieborg and Poell explored how the political economy of the cultural industry changes through platformization[5]. Bekele et al. investigated the latest technologies in augmented reality, virtual reality, and hybrid reality systems from a cultural heritage perspective. In addition, he also identified specific application areas in digital cultural heritage and provided recommendations on which technology is most suitable in each case[6]. Culture involves various aspects of society and has been applied in many fields, but there is little research on cultural dissemination.

Image processing technology has been applied in industries, medicine, and other fields, as well as interactive tools and imaging measurements. Mohan and Poobal used image processing technology to detect cracks[7]. Berg et al. introduced an easy-to-use interactive tool to bring machine learning-based (biological) image analysis to end users without extensive computational expertise[8]. Li et al. utilize large memory beams for analog signal and image processing[9]. Rizzo et al. analyzed the facts and challenges of image analysis[10]. Radha et al.[11] and Zwanenburg et al.[12] proposed the standardization initiative for image biomarkers and applied it to the standardized quantitative imaging omics of high-throughput image phenotypes. Among the many applications of image processing technology, no research has been found to apply it to cultural dissemination.

This study examined cultural dissemination using image processing technology and evaluated it using the four-degree evaluation approach of dissemination effectiveness to increase its effectiveness. The project looked at how the employment of image-processing technology affected the cultural distribution of works in writing, calendar, music, philosophy, food, and craftsmanship that were of interest to the general public. The study concluded that text, calendar, music, medicine, ideology, food, and craft culture have all increased to varied degrees in terms of their dissemination, influence, friendliness, and interaction. This article used image processing technologies to simulate the process of cultural spread, in contrast to prior experiments.

2. Problems, development trends, and roles of cultural dissemination

2.1. Problems in cultural communication

Multimedia development is a double-edged sword for the inheritance and development of excellent culture. It provides opportunities but also brings some potential challenges. At the same time, the development of cultural dissemination is also going through twists and turns.

2.1.1. Low enthusiasm and insufficient participation

In the multimedia era, social development is changing rapidly, and the internet has reached a stage of ubiquitous development. People's living standards have greatly improved, and the channels and forms of

cultural interaction are becoming increasingly diverse[13,14]. In this context, nearly half of the respondents are still unfamiliar with disseminating excellent culture and related activities. It is easy to see that most people have a sense of cultural identity, responsibility, and a desire to learn about culture. Still, due to certain restrictions, the degree of participation in cultural communication is generally not high[15].

2.1.2. Lack of communication channels and poor communication effectiveness

The media plays a direct role in the way people understand and think about things. With the rapid development of digital media, new trends have emerged in people's organizational, thinking, and behavioral styles. For society and culture, media can accelerate their evolutionary process and change existing forms of communication. Culture has thousands of years of embedded history. In the old forms of communication that mainly relied on language, writing, and oral communication, interpersonal communication was the main form, primarily determined by time and space, and could not reach people.

2.1.3. Inhibition of excessive entertainment on cultural development

At present, the level of the internet and the entry threshold are not high, so more and more people are eager to join the flood of the information age. Cultural mediators focus more on the amusement of cultural exchange than the important questions of cultural history in order to further their interests. In such a setting, films made by cultural intermediaries disregard historical truths and only place an emphasis on fun, which is similar to some people's defamation and cultural distortion. This poses a serious threat to the public's ability to propagate good ideals, particularly among young people. This puts a lot of pressure on individuals who support positive energy at the same time.

2.2. Development trends of cultural communication

After years of development, people's material lives have been greatly improved, and higher requirements have been put forward for spiritual and cultural needs. The country is paying more and more attention to cultural construction.

However, realizing that not all traditional cultures can flourish is equally important. Some are dormant due to their complex and unique heritage. In contrast, others are difficult to maintain due to the influence of public policies and may only develop related cultural and creative products.

2.3. Role of cultural communication

2.3.1. Promotion of cultural dissemination to the generation of multiculturalism

With the emergence of language, humans have shifted from communicating through gestures, eyes, and body movements to communicating through language, with even more profound significance. With the development of society, humans have invented writing, shifting from verbal communication to written communication, which has played a significant role in promoting culture and laid a solid foundation for the emergence of multiculturalism. In this situation, various regional cultures have separated from their own "villages" and become ethnic cultures reminiscent of "rivers flowing into the sea".

2.3.2. Storage and inheritance of cultural achievements caused by cultural dissemination

The birth of printing communication is a revolutionary change in the history of communication. It enables cultural dissemination to play an extraordinary role in cultural accumulation, reproduction and inheritance, cultural popularization and democratization, and the gradual transformation of culture into material and spiritual products. The use and dissemination of this cultural product depend entirely on the power and mode of cultural dissemination to meet the needs of society. Whether the product, especially the invention born in a particular place, would disappear in the future depends on the degree of interaction. Printed matter is a medium that allows new cultural ideas, concepts, innovations, and information to be stored, disseminated, and

reconstructed, both as senders and selectively as receivers. This is a prerequisite and foundation for the further development of culture. Without these cultural dissemination functions, cultural development would become an empty building without this premise and foundation. To avoid this situation, every country or ethnic group attaches great importance to choosing cultural diversity, which always ensures the healthy development of the dominant culture.

2.3.3. Accelerating the process of globalization through cultural dissemination

Human society has gone from language to electronic communication to information society. Cultural communication has also evolved from interpersonal to mass and international communication. Today, cultural dissemination is a global phenomenon and an international phenomenon. Globalization is the globalization of human social relationships and interactions. Networked technology provides people with a new cultural exchange platform in this era. It is similar to a vast "information supermarket" and becomes a "space" for the public to gather, that is, the "public domain".

2.4. Subjects and objects of cultural communication

The subject of cultural dissemination refers to the actors who express different opinions through online multimedia. In the multimedia environment, the total number of cultural communication subjects has increased, and they can be divided into several categories based on the behavioral dynamics between different cultural groups. The first category is ordinary people, composed of netizens unrelated to cultural activities. The number of ordinary people is enormous, and their influence is gradually increasing with the emergence of self-media. The second type of actor is an opinion leader or opinion maker. This type of person mainly includes journalists and columnists, who often have more significant influence within a particular group. The third type of actors are regulatory actors, including news officials and experts representing public institutions and legislation. They should guide public opinion with a true spirit and solve public crises by the law, thereby reducing the negative impact of culture. The fourth type is related actors interested in cultural activities, including participants, victims, and beneficiaries. Their situations are complex, and their opinions often play a decisive role in developing cultural activities.

The goal of cultural dissemination is to spread culture and to function as a catalyst for cultural issues and concerns. Hot subjects are found, and hot news spreads swiftly in the big data. The advancement of multimedia technology makes it possible for cultural items to arouse the audience's senses significantly, leading to the quantification of artistic creation. In the context of big data, the primary subjects of multimedia culture are news, current affairs, and social issues.

3. Image processing technology

Images are growing in popularity and becoming a vital visual necessity in people's lives in today's fast-paced society. Communication in the multimedia network environment has more varied and nonlinear forms of motion than the single and linear forms of the printing age[16,17]. In the multi-media network environment, cameras and images have evolved into crucial elements of culture and social life, and people today acquire culture more by seeing images than through reading. Semiotics theory's presentation and continuous development have played a positive role in the emergence and development of multimedia culture and provided adequate theoretical support. Symbols mediate culture. In the context of the visual age, characters carry meaning and gradually become carriers and forms of expression of intention. Over time, mature and popular cultures are increasingly intertwined, and the new forms of communication in electronic media and the online world have accelerated the process of cultural dissemination[18,19].

Printed matter is increasingly linked to images in daily life, and people's reading methods have changed from "looking at images" to "reading images". This is because in the process of reading a text, "reading" is

considered an activity. In contrast, the text is regarded as an abstract expression symbol through which readers can think and understand and ultimately make appropriate explanations for the message the communicator wants to express. Images have a more vivid imagination than traditional text. It can deepen people's impression of things and is more universal than words, so the focus of cultural aesthetics is gradually shifting from words to images.

3.1. Advantages of multimedia image processing technology

In the context of digital and intelligent development, multimedia image processing technology is also constantly improving. Multimedia image processing technology mainly has the following advantages:

In multimedia, image processing can be improved by digitizing a pair of simulated images into different two-dimensional arrays. Digital image processing technology has high processing accuracy, and image processing can be achieved by digitizing a simulated image to create various two-dimensional arrays.

Digital image processing methods have great potential in information compression. In digital images, pixels are not independent. There is a high degree of correlation between them, and there are often close pixels or identical gray shadows in the picture. In television images, two pixels in two or one row are adjacent, so information compression has excellent potential in image processing.

3.2. Image processing technology in multimedia network environment

3.2.1. Digital watermark generation technology

In the multimedia industry, image processing technology is one of the most critical factors, so improving digital image processing technology is necessary. Digital watermarking technology is a unique image-processing technology in the multimedia industry. It is a specially designed invisible logo that uses digital embedding to hide information unrelated to multimedia processing in digital images and other digital content. This digital watermarking technology turns multimedia images into video watermarks, which are the most fruitful in digital watermarking research.

3.2.2. Embedding technology

One of the essential technologies in digital image processing is embedding technology. In this technology, firstly, to avoid deletion errors, video and audio image data should form a marker in the two aspects it covers. Secondly, to improve control over the embedding procedure during digital image processing operations, technicians can strictly follow their guidelines during image processing to guarantee the quality of the embedded data, such as analyzing the embedded image pixel array, extracting the watermark data, transferring the extracted data and obtaining the final watermark data before processing the data. In addition, to improve the immersion technology level, the adopted immersion technology process requires strict specifications and procedural requirements to ensure digital image processing technology.

4. Application of multimedia networks and image processing in cultural communication

4.1. Application of multimedia networks in cultural communication

4.1.1. Multimedia provides a carrier for cultural dissemination

A communication method is readily accepted in the multimedia era, and a multi-dimensional cultural communication method has emerged. Firstly, multimedia has become an essential source of work and food for modern people, and multimedia as cultural dissemination aligns with today's needs. Secondly, multimedia has a vast user base, especially since the 1980s and 1990s. As the leading force in the use of multimedia, it is also of great significance for cultural dissemination and development. As a platform for cultural dissemination,

multimedia can better fix cultural dissemination in modern people's production and life.

4.1.2. Multimedia enriches the dissemination of culture

Culture is disseminated more through radio and television in the age of conventional media, which is ineffective and difficult to have a significant influence. With the aid of multimedia, cultural transmission can become "fingertip reading". With the use of governmental websites and other platforms, cultural distribution has substantially improved in efficiency and can now take into account the cultural preferences of different groups. As a result, expanding communication routes are crucial for cultural transmission in a diverse social environment. It boosts people's enthusiasm for engagement while enhancing the efficacy of cultural spread by utilizing a variety of communication tools.

4.1.3. Multimedia enhances the interactivity of cultural dissemination

Culture has apparent "vitality", so cultural dissemination must develop its "interactivity" to showcase the charm of culture. The rigidity of culture and the lack of public participation in cultural dissemination are not conducive to integrating culture into people's lives, making it play a positive and influential role. Firstly, cultural dissemination should highlight the connotation of culture and play an essential role in the interaction of social development. Secondly, the interactive platform of the new mass media has increased the interaction between culture and young people, enhancing their understanding of culture. Once again, it should be emphasized that the new mass media has a wide range of dissemination and high participation.

4.1.4. Cultural communication paths in the multimedia environment

Cultural dissemination has gained a new focus and carriers in the multimedia environment. Therefore, the key to the development of cultural dissemination is to construct cultural dissemination pathways, expand cultural dissemination, and develop cultural values, thereby deepening the critical role of culture in social development and creating a broad mass foundation. Therefore, in the multimedia environment, the result of cultural communication routes can be achieved from the following aspects:

Cultural dissemination can be expanded by relying on traditional media platforms. As an important tool for production and life in the new era, multimedia embodies the role of multimedia in cultural dissemination. It adds a platform to expand the space for cultural dissemination. Firstly, according to the needs of cultural development in the new environment, new cultural dissemination models should be constructed to strengthen the social halo of culture. Secondly, it is necessary to cooperate with the construction of cultural dissemination to enrich the cultural connotations of multimedia. As an important medium, multimedia must have cultural connotations and strengthen the construction of multimedia culture. Especially in the multimedia environment, cultural entertainment, and vulgarization are not conducive to disseminating and developing excellent culture.

New patterns of development can be constructed through innovative cultural dissemination methods. Firstly, innovative communication methods based on multimedia environments can provide the public with more practical and rich cultural knowledge and expand the social influence of culture. Secondly, the integration and development of multimedia and traditional media fully utilize the communication advantages of media and achieve richer cultural dissemination, thereby providing the general public with rich and colorful cultural programs to meet social development needs. Thirdly, the loss and poor protection of culture are mainly due to the inadequate dissemination of culture and the public's lack of awareness of protection. In this regard, it is necessary to rely on multimedia to strengthen education, promote cultural values, and instill a sense of respect for traditional culture in the public to create an environment conducive to cultural dissemination.

4.2. Application of image processing in cultural communication

With continuous innovation and development, the requirements for processing graphics and images in cultural communication continue to increase. It is precisely this high requirement that defines the concept and

definition of graphics and images. The use of digital storage media to process, capture, and store information and data on a computer is known as visual art. The data and information stored in vector units can be called graphic images. Graphics can describe various scenes and images, including interrelated, comprehensive, and geometric elements. Therefore, the description of the texture, style, and attributes, as well as the spatial and temporal position of objects in the graphics themselves, has a certain degree of clarity and detail. Meanwhile, graphics in cultural communication refer to using easy-to-use, simple shapes and straight-coloured lines as general descriptions.

Compared to graphics, there are more types and complexities of images, which require richer and more complex descriptions of the structure of objects. The image focuses more on the order and pattern of the things defined on the current screen and the structural shape and appearance of the current scene environment. Image processing differs from graphic processing in some aspects, allowing for a more excellent representation of photographic scenes and providing more realistic pictures and detailed descriptions of basic phenomena. The advantage of image processing lies in delivering data with more three-dimensional and complex features while demonstrating flexibility in processing and converting data. Images and graphics have both general functions and unique advantages in cultural dissemination. Therefore, using images in cultural dissemination is very effective and essential. Taking the simplest example, using image processing technology can achieve good results in promoting artistic crafts, as shown in **Figure 1**.

Figure 1. The denoising effect of images.

Image processing techniques can beautify, optimize and enhance images to make them more attractive and infectious. By adding colour saturation, contrast and other adjustments, images can be made more vivid and distinctive, attracting the attention of the audience. In addition, by adding special effects and filters that provide artistic effects, images can be made more interesting and unique.

In cross-cultural communication, the use of images containing cultural symbols and elements can better promote cross-cultural communication and understanding. For example, an international brand uses image-processed images in its advertisements, which contain a variety of cultural elements that can resonate with and be understood by audiences of different cultures, thus enhancing the effectiveness of the brand's communication in different markets.
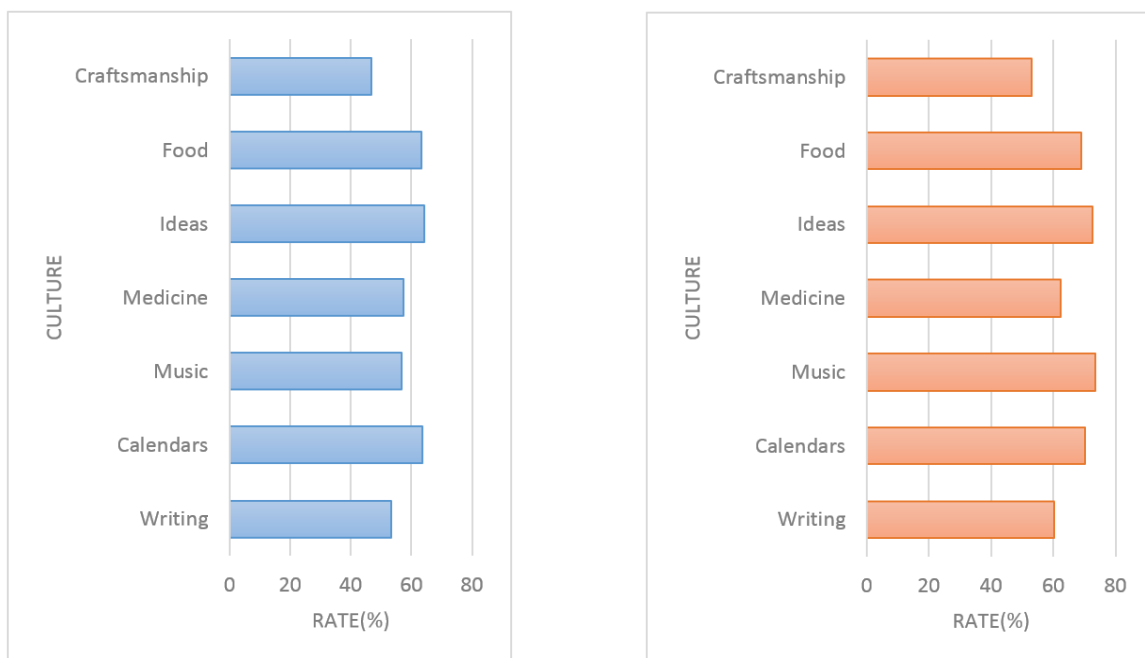
5. Cultural dissemination effect

To improve the effectiveness of cultural dissemination this article used the four-degree evaluation method to evaluate the effectiveness of cultural dissemination. At the same time, this article analyzed the cultural dissemination effects before and after using image processing technology, taking common cultural dissemination effects in the fields of text, calendar, music, medicine, ideology, diet, and craftsmanship as representatives. An analysis was conducted from the perspectives of cultural dissemination, influence, friendliness, and interaction, and the results were recorded.

In this regard, before analyzing the effects of cultural diffusion, a cultural exhibition on the fields of writing, calendar, music, medicine, thought, food and crafts was designed for public diffusion, and the cultural

exhibition was divided into two parts, one with the application of image processing techniques and one without any processing. This is followed by data aggregation, visualization and correlation analyses of the power of cultural communication using statistical software to study the correlation between cultural communication and other factors. Relevant data on the presence of a given cultural activity, including page views, sources of visits, social media shares and interactions, and number of followers, will also be collected, from which some indicators of cultural impact will be obtained, in terms of the cultural market, cultural resources and cultural environment. In addition, an online evaluation and feedback system will be developed to allow participants to communicate online about the effects of cultural communication in the areas of writing, calendars, music, medicine, ideas, food and crafts before and after the application of image-processing technologies, after which the system will automatically calculate the rate of interactivity and user-friendliness.

5.1. Evaluation results of the four-degree evaluation method for communication effectiveness

The degree of cultural dissemination is the most intuitive indicator of the effectiveness of cultural dissemination. The survey results of cultural dissemination before and after the adoption of image processing technology are shown in **Figure 2**.
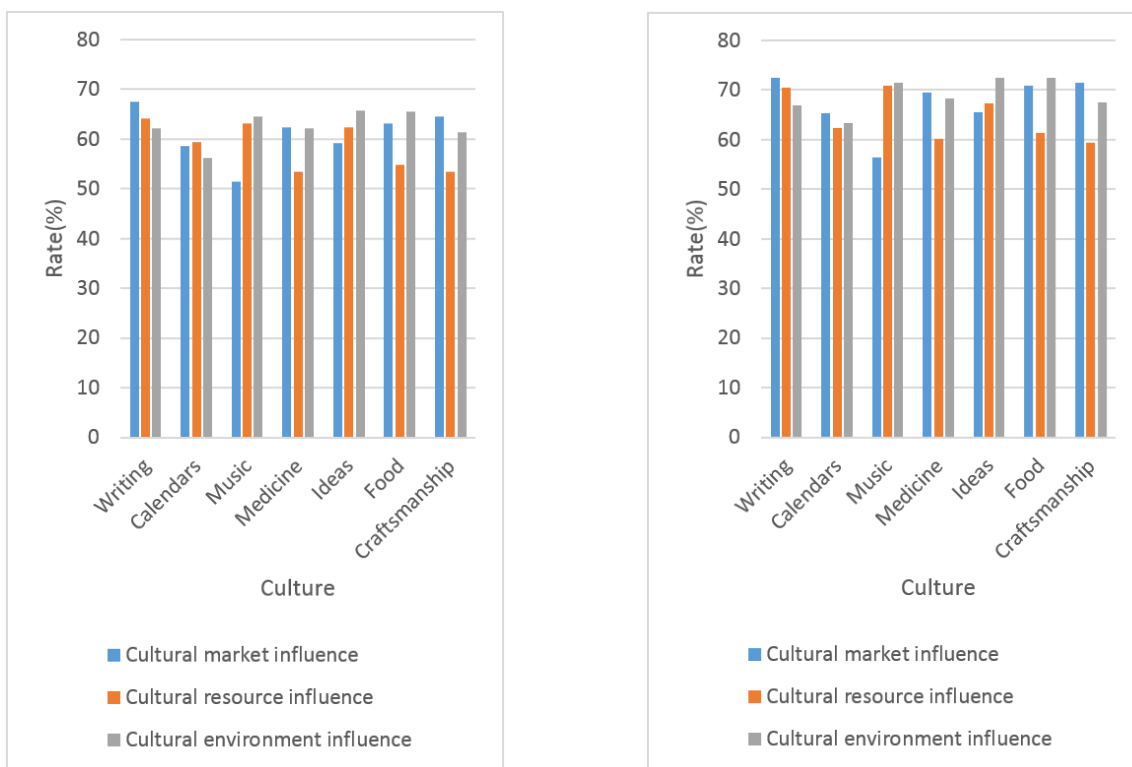

(A) Degree of cultural dissemination in each cultural field before the use of image processing technology.

(B) Degree of cultural dissemination in each cultural field after the use of image processing technology.

Figure 2. Cultural dissemination before and after the use of image processing technology.

Figure 2A shows the degree of cultural dissemination in various artistic fields before the use of image-processing technology. In contrast, **Figure 2B** shows the degree of cultural dissemination in different cultural fields after the use of image-processing technology.

Before the development of image processing technology, the rate of cultural diffusion was generally low, falling between 40% and 65% in a variety of artistic sectors. However, the rate of cultural diffusion in diverse cultural domains might increase to 50% to 75% with the implementation of image processing technologies. This demonstrates how using image processing technology can greatly speed up the spread of culture and increase its effectiveness. The analysis was conducted because using image processing technology can make cultural works more delicate and clear, resulting in better public perception of cultural works and outstanding cultural dissemination benefits.

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The survey of cultural influence includes the influence of cultural markets, cultural resources, and cultural environment. This article analyzed the influence of culture in these three aspects and summarized the results in **Figure 3**.

(A) Degree of cultural influence in each cultural field before the use of image processing technology.

(B) Degree of the cultural influence of each cultural domain after using image processing technology.

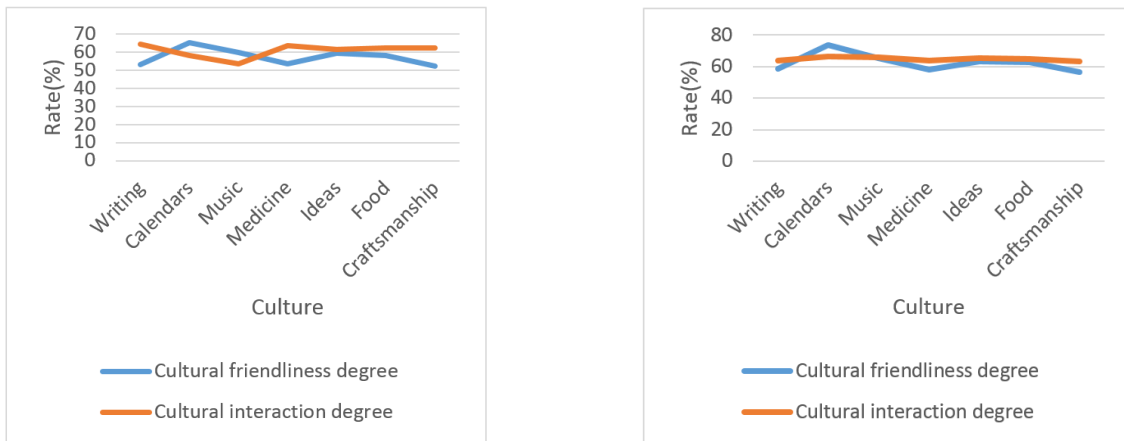**Figure 3.** Degree of cultural influence on cultural domains.

Figure 3A shows the cultural influence of each cultural field before the use of image-processing technology, while **Figure 3B** shows the cultural influence of each cultural field after the use of image-processing technology.

In terms of the influence of the cultural market, compared to before using image processing technology, the influence of the text after using image technology increased by 5.1%, and the influence of the calendar increased by 6.8%; the influence of music increased by 5%, and the influence of medicine increased by 7.1%; the influence of thought increased by 6.3%, and the influence of diet increased by 7.8%; the influence of the process increased by 7%. It can be seen that the influence of the food culture market increased fastest. The reason is that food culture makes the public directly feel the beauty and taste of food after adopting image processing technology, thus promoting the improvement of food market influence.

The influence of textual cultural resources increased from 64.2% before the adoption of image processing technology to 70.5% after the adoption of image processing technology, an increase of 6.3%; the influence of calendar cultural resources increased by 3.1%, and the influence of music cultural resources has increased by 7.6%; the influence of medical cultural resources increased by 6.6%, and the influence of ideological and cultural resources increased by 5%; the influence of food culture resources increased by 6.6%, and the influence of craft culture resources increased by 6%. The influence of music and cultural resources increased the fastest among them. Therefore, music culture is not only an auditory experience but also a visual experience. The use of image processing technology can improve visual effects and greatly enrich music resources, thereby enhancing the influence of music and cultural resources.

The influence of the cultural environment in the fields of text, calendar, music, medicine, ideology, diet, and craftsmanship using image processing technology increased by 4.9%, 7.2%, 7%, 6.1%, 6.7%, 6.9%, and 6.1%, respectively. In addition to the influence of the textual cultural environment, the influence of the cultural environment in various cultural fields increased by more than 6%, indicating that image processing technology had effectively played a role in improving the influence of the cultural environment.

Cultural friendliness and interactivity are in one continuous line and complement each other. Generally speaking, the friendliness of culture is high, and its cultural influence would correspondingly increase. Therefore, this article combined the two for analysis. The survey results of cultural friendliness and interactivity are shown in **Figure 4**.

(A) Cultural friendliness and interaction of each cultural domain before the use of image processing technology.

(B) Cultural friendliness and interaction of each cultural domain after using image processing technology.

Figure 4. Cultural friendliness and interactivity of cultural domains.

Figure 4A shows the cultural friendliness and interactivity of each cultural field before the use of image processing technology, while **Figure 4B** shows the cultural friendliness and interactivity of each cultural field after the use of image processing technology. Both cultural friendliness and interactivity in many cultural sectors showed an upward trend in comparison with the use of image processing technology, although overall, the rise in interactivity was less apparent than that in friendliness. Prior to the widespread adoption of image processing technology, there was a significant gap between how amiable and engaged various cultural fields were to one another. The adoption of image-processing technologies, however, began to narrow the gap between cultural friendliness and interactivity. This implied that the use of image-processing technologies might improve the effectiveness of cultural dissemination.

5.2. Media environment

The current media environment has shown new changes and characteristics compared to traditional media environments. Based on this, this article surveyed the media environment and recorded the results in **Table 1**.

Table 1. Media environment analysis.

Features	Traditional media	New media
Immediacy	55	61
Massiveness	56	64
Globalization	54	62
Interactivity	58	62
Multimedia	62	69

From this, it can be seen that the current development trend of the media environment is towards real-time, massive, global, interactive, and multimedia. Among them, the multimedia characteristics of the current media are the most prominent, so the development of the multimedia environment is the trend. In this environment, image processing technology would also have better development prospects.

Previous applications of image processing technology in cultural communication mainly involved how to use image processing technology to enhance the effect of cultural communication. For example, image enhancement or restoration, image style conversion, cultural image data analysis, while this paper mainly applies the digital watermark generation and embedding technology in image processing for image denoising and beautification to make the image more vivid, interesting and distinctive, and to improve the attractiveness and effect of cultural communication.

By generating and embedding digital watermarks, the integrity and authenticity of information in cultural communication are ensured, and the audience's trust and acceptance of cultural products are improved. The application of digital watermark generation and embedding technology in image processing can achieve more diversified and personalized cultural communication methods. Allowing the audience to scan the digital watermark to obtain more relevant information or to interact enriches the interactive experience between the audience and the cultural products.

In conclusion, according to the results of the study, it can be seen that the research on using image processing for cultural communication is effective in improving the communication power, influence, interactivity and friendliness of cultural products. It also has practical significance in promoting cross-cultural communication and understanding, increasing the attractiveness and effectiveness of cultural education, and promoting the development of the digital culture industry. These implications have important guiding roles not only for academic researchers, but also for cultural practitioners, educators, and the digital culture industry.

6. Conclusion

Image processing technology based on multimedia network environment has an important role in cultural communication. This paper first introduces the problems, development trend and role of cultural communication, and then analyses the multimedia image processing technology specifically. Then it describes the application of multimedia network and image processing in cultural communication and analyses the effect of cultural communication. In order to improve the effect of cultural communication, in the multimedia network environment, this paper uses image processing technology to improve the cultural communication method and optimize the cultural communication path, so as to achieve a good cultural communication effect. The experimental results show that the use of image processing technology in cultural communication improves the cultural communication power, influence, affinity and interactivity in various cultural fields. The research in this paper provides theoretical and practical support for cultural communication based on image processing in a multimedia network environment. However, there are still some gaps and problems that need to be explored and solved by future research: how to further improve the application and practical effect of image processing technology in cultural communication, so as to make it more adapted to the needs of multimedia network environment.

Author contributions

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare no conflict of interest.

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