

# Internet-based New Media in Information Visualization

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**Abstract**—With the rapid development of mobile wireless Internet, the arrival of the information age has changed the way we think and communicate, and the pervasiveness of social media has prompted us to live in a culture of continuous learning and sharing. The influx and collection of information need to be controlled and applied, which has prompted changes and innovations in the means of information dissemination. The human visual system has amazing processing functions, and the visualization of information enables us to quickly and effectively gain insight and understanding of the communication of information. This article aims to study the application of Internet-based new media in information visualization. Based on the analysis of the shortcomings of traditional media information visualization design, the development characteristics of new media, and the superiority of information visualization design in new media, it is necessary to conduct new information on the residents of a certain city. Media information visualization questionnaire survey to understand the city's residents' understanding of new media information visualization. The survey results show that new media information visualization has a wide range of applications. What residents know best is new media charts, accounting for 24.5%; next are data news and information websites, accounting for 20% and 19.5% respectively; what residents don't know is interaction design, the number of people who understand is only 10%.

**Keywords**—Internet, New Media, Information Visualization, Information Chart

## 1. INTRODUCTION

With the rapid development of science and technology at the end of the 20th century, society has entered the era of digital media from the previous industrial era. Digital intelligent products abound in people's daily lives. The visualized communication of digital information under the new media environment has become life. The main information dissemination method for people in China to communicate and communicate, we can say without hesitation that the current era is the era of "new media". With the development of intelligence and energy interaction and the continuous digging and innovation of information technology, the time of high speed transmission of information has come, and the new media has become the main flow form of media. The proportion of mobile equipment with smart mobile phone and flat plate electronic brain as the main flow is constantly increasing, and has become a heavy force for the rapid development of media industry. The research on the visualization of ecoenvironment information in the new media will first help

to promote the development of visualization of information under the new visual Angle. At the same time, it also provides theoretical and practical reference for the research on the application of information visualization in new media. Under the influence of new media environment, the change of information transmission mode not only changes people's lifestyle, but also changes people's way of thinking and design thinking. Information visual design is one of the important ways of communication in the process of information communication, and it also contains the comprehensive cross disciplines of technology and art. It is influenced and impacted by the arrival of the new media era, but it also brings new opportunities and challenges to the development of information visual design.

Based on the analysis of the shortcomings of traditional media information visualization design, the development characteristics of new media, and the superiority of information visualization design in new media, this paper conducts a questionnaire survey on the visualization of new media information among residents of a certain city to understand the extent to which the residents of this city understand the visualization of new media information. The survey results show that new media information visualization has a wide range of applications. What residents know best is new media charts, accounting for 24.5%; next are data news and information websites, accounting for 20% and 19.5% respectively; what residents don't know is interaction design, the number of people who understand is only 10%.

## 2. RELATED WORK

The change in the way of information dissemination under the influence of the media environment has not only changed people's lifestyles, but also changed people's way of thinking and design thinking. Information visualization design is one of the important communication methods in the process of information dissemination [1-2]. It also includes a comprehensive cross-discipline of technology and art.

Bongshin presents a condensed summary of the research results of post-WIMP interaction techniques in visual systems. Includes research from the broader HCI community, as well as several industry product releases related to and affecting visual interfaces [3]. Jeritt applied the HCD process to develop a rapid medical interoperability resource (fhir) application that displays the patient's history of asthma to clinicians in the pediatric emergency department [4]. Carlos identified the cluster of academic networks through

co citation analysis. In addition, Automatic Term Extraction and co word analysis are used to sort and group terms with high semantic value [5].

While being affected and impacted by the arrival of the new media era, it also brings the development of information visualization design. There are new opportunities and challenges [6-7]. Dynamic information visualization design adopted in hannover World Expo and dynamic information design of Dutch Cultural Festival are excellent information visualization design works created by combining new media technology with traditional media [8]. Why Not Associates, a British design company, has also been studying the application of visual design of information. This design company has designed a number of excellent advertising videos using new media technology for THE BBC and a famous sports brand [9-10].

What can we learn through the literature review, the new media has gained great attention in the field of art, in the above literature review, scholars from all walks of life for new media research is relatively comprehensive, research on information visualization design are the way forward, this paper based on the existing research, find new breakthrough, puts forward some new development thought.

### 3. RESEARCH ON INTERNET-BASED NEW MEDIA IN INFORMATION VISUALIZATION

#### 3.1 Disadvantages of Traditional Media Information Visualization Design

##### (1) The cumbersomeness of information dissemination

The information visualization design process of traditional media is generally more complicated. For information visualization design, it is its ultimate and main purpose to quickly and accurately convey information to the audience. In the traditional media environment, it is similar to traditional printing. In the process of information dissemination in the media environment, generally speaking, the first draft is drawn, and then the second rough draft design is carried out, and finally the final draft can be determined. At the same time, the rough draft cannot be printed. It is necessary to manually paste some cut icons and information on the rough draft to see the original effect. After the rough draft is determined, there will be other subsequent steps. From this we can see that the production of information visualization design works under traditional media requires a lot of tedious manual production projects, which also cost a lot of manpower and material resources, as well as time and money investment expenditures. If once if an error occurs, it is extremely troublesome for subsequent modifications.

##### (2) Mandatory information dissemination

In the surroundings of people's lives, whether it is the existence of traditional media such as newspapers, books, posters, outdoor advertisements, television, and radio, the dissemination of these information is mandatory to push the information directly into the brains of the public, in hope can leave a deep impression on the public to achieve their own purpose of information dissemination and propaganda. In the process of information dissemination, the disseminator of information is in a proactive and strong position, as the receiver of information-the public can only be in Receive information passively. At the same time, in the process of information dissemination, the publicity of advertising

content mixed with information is completely unavoidable. The public's choice of advertisements and unwanted information, this one-way communication is traditional media's information visualization. The main drawback in the design is that for the general public, this compulsory communication method that cannot be ignored can easily cause psychological resistance, and the communication effect caused by such information dissemination will only be a bad side. Information will not be effectively disseminated.

#### 3.2 New Media Development Characteristics

##### (1) Interactive propagation characteristics

The most prominent aspect of new media in the process of information dissemination lies in its interactive communication characteristics, which is completely different from the unidirectional linear dissemination method under traditional media in the past. In the process of dissemination of information, the audience occupies an active position. It is not passive and compulsory to receive information. The information disseminated in the face of different audiences is a different return of information. The interactive information dissemination method focuses on emphasizing and paying attention to what people feel from emotional cognition in the process of information dissemination.

##### (2) Comprehensive propagation characteristics

The new media has typical media characteristics that integrate various communication language symbols such as video images, sounds, text, film and television animation, etc., and it has remarkable visibility and audibility, and the single vision emphasized by the traditional media in the past. The monotonicity is quite different. The new media technology makes the expansion function of information visualization design and the processing scope of information dissemination no longer limited to a single ordinary image and text. It integrates the elements of various media with each other, showing the unique characteristics of typical new media, such as advertisements, online videos, etc., and provides wireless possibilities for creation.

##### (3) Cooperative propagation characteristics

The information under the new media is not only applied to the mutual cooperation of related media software technology and information technology in the dissemination process, but also combines artistic aesthetics, similar to the interface design and product design of general websites or information. These all need to rely on the cooperation of technical personnel and designers. Designers are generally responsible for the design content in information visualization, while technical engineers need to deal with the structure of the program and the design of coding.

#### 3.3 Superiority of Information Visualization Design in New Media

Information visualization design is a communication mode composed of a variety of visual symbol elements to convey information. It has the following two characteristics: one is the production of information, and the other is the dissemination of information. Information visualization design is one The visualization of information dissemination process. In the environment of new media, the people's daily life is everywhere and shows the huge changes in the information dissemination and communication mode brought about by technology and technology, changing the

way people express information differently from the past. We are in the era of rapid development of science and technology. The combination of digital media and information technology has greatly changed the information dissemination mode and expression form under the information visualization design, and it has begun to transform from the previous two-dimensional plane communication mode to multi-dimensional spatialization. The exchange of information has also changed from one-way passive acceptance to a two-way interactive level development.

#### (1) Integration of multiple forms of communication

##### 1) Development from static to dynamic

With the popularization and expansion of computers and the Internet, and the combination of personal intelligent terminals and information visualization design, information visualization design is also completely different from traditional traditional media in design techniques and communication modes. The information visualization design under the new media environment has more advantages and development compared with traditional media. With the extensive application of new media technology in the field of information visualization design, the performance and communication of information visualization tend to create a dynamic environment for information. The current information visualization design has the same performance as the traditional media information language design in the past. Forms and design techniques, and on this basis, digital technology has been added to enrich and greater changes in the information dissemination mode. The information visualization design under traditional media and new media environment has been fundamentally different. From the perspective of the language design and dissemination of information, the dynamic information visualization design in the new media environment mainly expresses the reorganization and realism of the space. In the layout of the timeline, the language design and communication of information are all through time and The two key points of space are unfolded around. We can see that the presented information design elements are no longer dull and static. It emphasizes a sense of rhythm of movement, and in the process shows the public a colorful and beautiful enjoyment. The dynamic information visualization design and dissemination has increased a lot of information that could not be included in the past than the static information dissemination under the traditional media, so that the public does not have to worry about the sense of time and space limitations when receiving information, and provides another new vision experience and psychological feelings. The continuous development of new media technology provides the possibility for better creative expression of information design, and also creates better and better conditions for the dynamic information visualization design and communication performance.

##### 2) Mutual integration of vision and hearing

Information visualization design is mainly to carry out information dissemination through the reconstruction of different information dissemination media carriers and a variety of different design elements. Multi-angle spatial and temporal design and performance are one of the major advantages of new media dissemination. The information dissemination method in the new media environment makes the information visualization design not only use vision and

hearing to disseminate information, but also incorporates other new feelings of a variety of physical senses. New media technology can combine graphics, images, text, sound, and animation. The overall system design and processing of different media forms ensures the psychological enjoyment of the public. Scientists have shown through certain experimental studies that the storage and memory of information in the brain under multiple body senses is much better than the memory effect of a single one or two. The same information is only tested by people's visual viewing and acceptance, after a period of time, the memory display degree displayed by the storage of the brain has not yet accounted for 10% of the total. The memory display degree combined with other various senses can reach 6 times the single sensory memory.

#### (2) Integrated media communication

Under normal circumstances, changes in the media environment and the emergence of new media do not occur suddenly. The replacement of old media by new media is based on the fact that traditional media in the past cannot develop under the changes of the times and society. Although the form of media is accompanied by the emergence of new media, traditional media will not completely disappear. New media and old media will gradually merge to produce new media. Information visualization design in traditional media is applied to print media for the dissemination and communication of information. With the development of new media, the mode of information dissemination has changed from the past traditional media dissemination mode to personal smart terminals and computers. These digital technologies disseminate Carrier. The constantly updated media environment means that the communication mode of traditional media is no longer the mainstream. Most companies or enterprises have also widely used new media technologies in product advertising to promote sales to consumers. We need to be clear about this. It is the emergence of a media that does not mean the death of the previous media, it means a new media form formed by the mutual integration of two media under the changes of the times. We should realize that no matter what form of change in the media and the way in which information is communicated, information visualization design is based on information dissemination as the ultimate goal, and it will increasingly move towards the interactive and humane direction of information.

## 4. EXPERIMENT

### 4.1 Questionnaire Design

This article selects a city to do a questionnaire survey on "the degree of understanding of the application of new media in information visualization" and "the advantages of new media in graphic design", randomly selected 352 residents from two districts, and a total of two districts There are 330 valid questionnaires; 172 questionnaires in area A and 158 questionnaires in area B.

### 4.2 Reliability of the Questionnaire

This paper uses the "half reliability" test method to test the reliability of the returned questionnaire. The reliability factor is calculated by equation (1) and the correlation factor of the questionnaire is  $r=0.883$ . The results of the tests confirmed the reliability of the questionnaire.

$$S^2 = \frac{(M-x_1)^2 + (M-x_2)^2 + (M-x_3)^2 + \dots + (M-x_n)^2}{n}$$

(1)

$$r = \frac{2r_{ban}}{1+r_{ban}}$$

(3)

$$r = 1 - \frac{S^2(1-r_1)}{S_n^2}$$

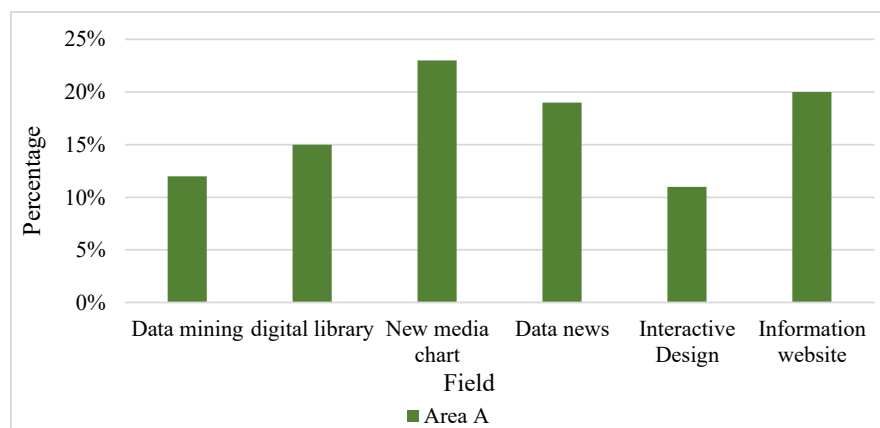
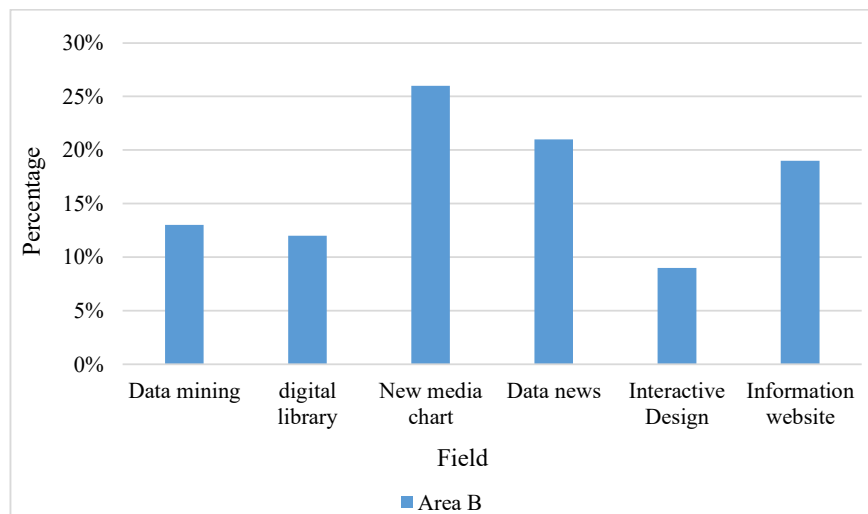
(2)

## 5. DISCUSSION

## 5.1 New Media Information Visualization Application Field

**Table 1.** New media information visualization application field

	Area A	Area B
Data mining	12%	13%
digital library	15%	12%
New media chart	23%	26%
Data news	19%	21%
Interactive Design	11%	9%
Information website	20%	19%

**Figure 1.** New media information visualization application field of area A**Figure 2.** New media information visualization application field of area B

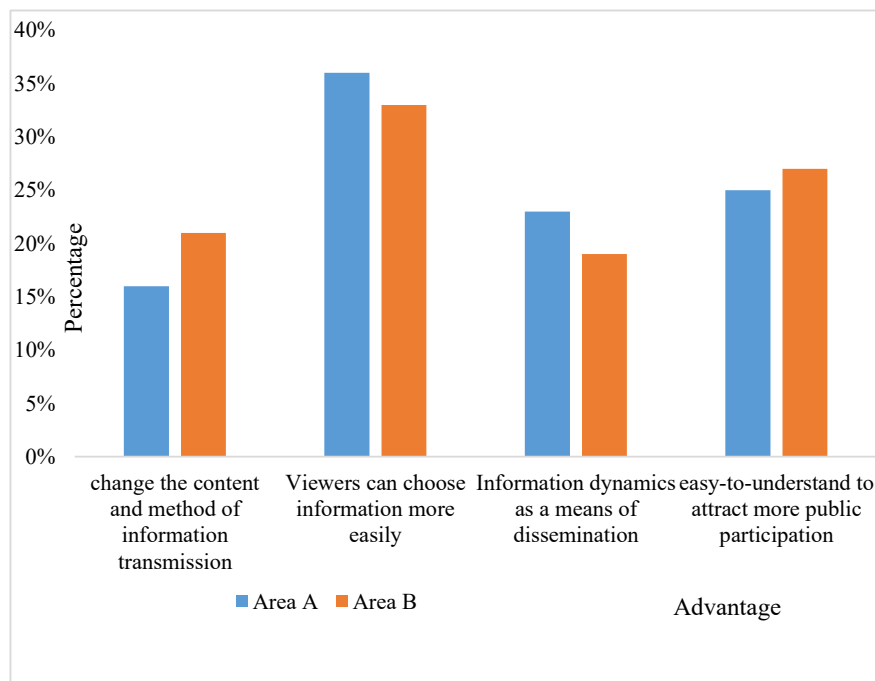
It can be seen from Table 1 and Figure 1 and Figure 2 that new media information visualization has a wide range of applications. What residents know best is new media charts, accounting for 24.5%; next are data news and information

websites, accounting for 20% and 19.5% respectively; residents are the most familiar. What I don't understand is interaction design, and only 10% of people understand.

## 5.2 Advantages of New Media to Chart Design

**Table 2.** Advantages of new media for graphic design

	Area A	Area B
change the content and method of information transmission	16%	21%
Viewers can choose information more easily	36%	33%
Information dynamics as a means of dissemination	23%	19%
easy-to-understand to attract more public participation	25%	27%

**Figure 3.** Advantages of new media for graphic design

As can be seen from Figure 3, on the question of "what advantages does new media bring to graphic design", 34.5% of residents believe that new media can allow viewers to choose information more easily and flexibly, making it difficult to read anytime and anywhere. The emergence of new media such as mobile phones, the Internet, and digital television has improved people's attitudes towards information, allowing them to browse and follow quickly and conveniently anytime and anywhere, and even closer the relationship between people and information. People have changed from passively receiving information to actively discovering, collecting and sorting out information. 26% of residents believe that for traditional media, audiences have very little feedback to the media, and there is less communication between audiences. Secondly, the new media has caused essential changes in the content and methods of information transmission, and the dynamic display of information in mainstream communication methods, accounting for 18.5% and 21%, respectively.

## 6. CONCLUSIONS

The change and development of information technology have brought us a huge impact, and at the same time it has brought unprecedented opportunities and challenges. Information visualization in the new media environment has become the mainstream information communication mode in the daily life of the public, and information visualization design is the current era. Under the important communication form in the process of information dissemination, the design techniques and expression forms of information visualization design under the new media environment have changed, and its design scope has also been infinitely expanded, no longer restricted by space and time.

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