

# Graphic design in public places under digital transformation

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## Abstract

Today, in the digital transformation, graphic design in public places is facing a series of challenges and problems, and the issue of readability of graphic design has gradually become important. Graphic design in public places needs to take into account the needs of all users, including the elderly and special groups, to ensure that the graphic design is well-readable and can be convenient and practical. The research aims to explore the ease with which contemporary graphics can build a graphic language environment for accessible recognition and humanistic care in public places in order to make information and instructions easily accessible to all user experience groups in public places.

## Keywords

Digital transformation; Graphic language environment; Public places; Humanistic care; User experience.

## 1. Introduction

The origin of graphics can be traced back to the beginning of human civilization. Graphics became an important tool when humans began to record and express their thoughts and experiences. Graphics are not only an expression of art but also a means of conveying information and recording history. Graphics are ubiquitous in our lives, serving to simplify information, enhance communication, and promote understanding. In this paper, we will analyze and reflect on the ways in which graphics can help people to better understand and make use of their environment in public places, not only across language barriers but also as a means of communicating with people from different countries, races and groups.

As Krampen, M.<sup>[1]</sup> said, that how graphic symbols can influence this behavior of the perceiver to the maximum extent will always be debated. This article focuses on the humanistic issue of special groups and aging people who cannot respond in a timely manner to graphic-type guiding messages in public places.

This paper adopts the research method of literature review to systematically sort out the existing research and understand the existing research results, theoretical foundations and methods. In order to study and analyze the above, quantitative analysis will be used to analyze the feedback on audience satisfaction, and qualitative research feedback will be used to derive the importance of graphic design in public places. The research method of case study is adopted to analyze successful design cases at home and abroad to understand their design concepts, methods and effects, and to refine the design principles and strategies applicable to this study through comparative analysis.

In summary, graphic design for bringing convenience to public spaces under digital transformation is analyzed and studied.

## 2. Digital Transformation and Convenience in Public Places

(1) The impact of digital transformation on public places

Digital technologies have made the dissemination of information in public spaces more efficient. Electronic displays, smart signs, and dynamic signage have replaced traditional static signage, allowing for real-time information updates and more accurate and timely guidance. This is particularly important in places such as airports, railway stations, and hospitals, where the speed and accuracy of information delivery can be significantly improved.

This is particularly important in places such as airports, railway stations, and hospitals, where the speed and accuracy of information delivery can be significantly improved. However, for illiterate, aging, and special groups, graphic information still has the advantage of being more intuitively communicated than textual information. "Promotion of a social agenda" [2] is what designers are supposed to do, and designers must plan and implement design outcomes in one way or another to help ameliorate social problems.

Overall, digital transformation needs to balance the relationship between vulnerable groups and the ease of access to public spaces while improving convenience and safety, ensuring accessibility for all groups.

## (2) The Importance of Convenience in Public Places

Convenience in public places has a significant impact and meaning on the health and well-being of society. Convenient public infrastructure can greatly enhance people's comfort and convenience in public spaces, thereby improving people's quality of life and city satisfaction.

In addition to social civilization, economic prosperity, environmental beauty, resource availability, and public safety, convenience of living is also highlighted in the "livable city criteria" proposed by the Chinese government. All of these indicators are the basis of sustainable or livable cities research [3]. Therefore, the importance of graphics for convenience in public places cannot be ignored. Graphics can provide immediate information feedback through concise and clear visual expression, helping the public to react and make decisions quickly in complex environments, effectively reducing the redundancy of information, improving the efficiency of space utilization, and optimizing the layout and design of public places.

## (3) The Role of Graphic Design in Enhancing Convenience in Public Places

Graphics, as a universal visual language that effectively communicates information across time and space and reduces barriers to understanding, play a vital role in improving accessibility in public spaces. In environments where people of different languages and cultures converge, graphic symbols can transcend most intangible boundaries to enable fast, precise and clear communication. We recognize toilet signs outdoors, we know whether to go up or down in a lift, and we obey traffic laws while driving ..... This is all thanks to the instant feedback of graphic design. According to one of Herbert Marshall McLuhan's important arguments that the medium is an extension of the human being, he argued that the medium is an extension or expansion of the human being's ability to communicate. Different media bring about different sensory states, produce different psychological effects, affect the way people perceive and react to the outside world, and bring about social impacts of different natures. The biggest impact of any media innovation is the change in people's way of thinking and lifestyle, which is subtle.

## 3. Graphic design principles and techniques

As Russell Bestley<sup>[4]</sup> states in his book, graphic design has been defined in its relatively short history of development as a problem-solving activity. Practical problems are posed and action is taken to find solutions to them. To follow the principle of standard, normative, effective and accurate, so that people can instantly identify without relying on language so that people feel safe, convenient and fast walking in a place, which requires that the graphic design of public places has the main functions of rapidly conveying information, clear and unambiguous guidance, and facilitating fast and accurate judgment of the actors.

Graphic design is used in a wide range of applications, including information display media. The dissemination of such information requires a high degree of visual appeal and message delivery. The tools of digital transformation make it possible to create graphic designs that are visually striking and convey a clear message. In addition, digital transformation has brought more interactivity to graphic design in public places, which is reflected in the provision of a more convenient and friendly environment for special groups of people with different needs. Interactive digital graphic design is geared towards voice assistants and Braille display devices for the visually impaired; for the hearing impaired, real-time captioning and sign language interpreting services are used, and so on.

In the context of digital transformation and graphic design of public spaces, the consideration of personalization and accessibility needs not only to enhance the user experience but also to ensure that all people, regardless of their abilities and occupations, have equal access to services. Personalization provides a tailored experience by considering the unique needs and preferences of the user. Digital tools can provide recommendations and services that are tailored to the user based on their behavior, preferences and historical data. In terms of accessibility, it ensures that digital tools and public facilities are accessible to all users. People with reduced mobility, for example, need to ensure that all digital devices and interfaces can be operated by simple touch or voice commands, avoiding complex manual operations.

#### 4. Examples of graphic design applications in public places

##### (1) Colourful patterns help demented people identify MTR exits

NMRT and Dementia Singapore are further expanding their collaborative program to help people with dementia find their way around. The first MRT station to implement the program is the Chinatown MRT station, where six exits are represented by five different colored nostalgic objects, with two of the exits sharing a single object due to their close proximity to each other. According to NMRT, the previous program at the Toa Payoh Bus Interchange was well received, and the general public also found that the design made it easier for them to find the buses they wanted to take. [5]

As soon as passengers arrive at the station before they step out of the gates, they will see huge directional signs on the ground guiding them to the six exits, with different colored arrow stickers featuring familiar objects. Starting in June 2023, NMRT is working with Dementia Singapore on the project and has invited three Dementia Advocates of varying degrees of dementia to advise on the design, size and placement of the stickers. The program will eliminate the fear of getting lost while out and about and encourage people with dementia to get out and about more, as interacting with the community can slow down the progression of the disease.

##### (2) City of Bath, England's signposting system

How do you subtly transform the streets and public spaces of a historic city like Bath, while still being contemporary? The project stems from a wider public realm and campaign strategy, 'Creating a Canvas for Public Life in Bath', which aims to transform the city's streets and public spaces, revitalize its economy and redefine its identity as a 21<sup>st</sup>-century city.

Pearson Lloyd's research drew on the city's geometric shapes, dominated by 18<sup>th</sup>-century architecture, and its status as a model city for the Age of Enlightenment. This led to the development of circular glass enamel maps, referencing compasses, lenses and sundials, which we set within rectangular bronze monoliths. This bold geometric aesthetic is shared with the bus shelters, which are made up of a series of bronze blocks. Overall, these products have a strong contemporary presence in Bath's streetscape, complementing the local stone and slate roofs of Bath through their materiality; while also being easy and cheap to maintain, and acquiring a beautiful, rich patina over time. The visual design of the information system is primarily a balance between the city's historic heritage and the civility of contemporary society.

### (3) Intelligent Guide Graphic Design for Taikoo Li on the Bund, Shanghai

The guide system of Taikoo Li on the Bund [6], unlike most other commercial bodies, is not a single 2D or 3D form but adopts the physical building sand table model, which deeply restores the scenes of the stone area, wood area and central park of Taikoo Li on the Bund, the building layout is clear at a glance, which lights up the consumers' visual senses at the first time, and at the same time, the graphic style of the intelligent guide system is in full harmony with the architectural style of Taikoo Li on the Bund. This ensures overall spatial coordination and coherence.

Under the trend of digital transformation, data interoperability is particularly important. Based on the 3D map production and output capability of the Chimage Intelligent Guiding System, Taikoo Li Foreshore can realize the interoperability and integration of data from the guiding side, mobile phone side and PC side. At the same time, it can also be docked with third-party systems to synchronize data such as membership, car parking and catering. It connects online and offline, realizes seamless connection between online and offline scenes, and continuously optimizes consumer and user experience.

## 5. User Experience and Evaluation

### (1) User Participation and Feedback Mechanism

User engagement and feedback mechanisms in public spaces are crucial in digital transformation. Users can conveniently submit feedback and suggestions through digital platforms and apps, which are instantaneous and can quickly collect user opinions, helping managers to keep abreast of user needs and experiences and make improvements accordingly. In addition, public places should regularly conduct online and offline user surveys to obtain more comprehensive and in-depth feedback data. Interactive touchscreens and self-service terminals can also be integrated with feedback functions, enabling users to submit comments and evaluations at any time during the use process. Using big data analytics, managers can collate and analyze the collected feedback data to identify common problems and trends so that data-driven decisions and adjustments can be made. This user participation and feedback mechanism not only enhances the quality and satisfaction of public services but also strengthens users' sense of participation and belonging, helping to build a more benign and interactive public environment. Overall, the construction of an effective user participation and feedback mechanism is of great significance to the realization of the linguistic environment of graphic design in public places in digital transformation.

### (2) User Experience Design Principles

User experience (UX) design is a key aspect of creating a successful digital transformation. It involves designing and improving the user's interaction and overall experience with a product, such as a website or mobile application. By focusing on user needs and behaviors, UX design creates an experience that is intuitive, convenient and satisfying to use. UX design principles such as user-centered design, usability, accessibility and consistency play an important role in ensuring that products are easy to use and efficient. The design process typically includes user research, information architecture, prototyping, user testing, and iterative refinement, with each step aiming to gain a deeper understanding of user needs and optimize the user experience. The right tools, such as wireframing tools, prototyping software, and user testing platforms, can greatly improve design efficiency and effectiveness. By applying these principles, processes and tools, UX design can significantly improve urban functionality, user satisfaction and social loyalty, thus playing a crucial role in the digital transformation to achieve ease of access for public places.

UX is critical to web-based technologies, products, and services because it plays a key role in creating an engaging, efficient, intuitive, and easy-to-access experience for any user, often

referred to as user-centered design (UCD) [7]. UCD emphasizes that every stage of the design process is guided by the needs and expectations of the user, starting with user research and needs analysis to ensure that the design solution UCD emphasizes that every stage of the design process is guided by user needs and expectations, starting with user research and requirements analysis, to ensure that the design solution effectively solves the user's problems and enhances satisfaction. UCD plays an indispensable role in digital transformation, ensuring that technologies and services can truly bring convenience and value to users.

### (3) Evaluating the Effectiveness of Digital Graphic Design in Enhancing Accessibility in Public Places

Accessibility of public places is an important aspect of urban planning and design, ensuring that all people, regardless of their physical ability, can effectively navigate and use public spaces. Traditional approaches to improving accessibility focus on physical modifications, such as ramps and tactile paving. However, digital graphic design offers a complementary strategy that can significantly improve the user experience by providing visual and informational aids.

The results of the study show that digital graphic design significantly improves the ease of access to public spaces. Quantitative analyses showed significant improvements in user satisfaction and ease of navigation, with respondents reporting clearer understanding and faster decision-making when digital graphics were available. Qualitative feedback emphasized the importance of simplicity, clarity and contrast in graphic design and the value of incorporating multi-sensory elements to cater to different groups. The case study demonstrates the successful implementation of digital graphic design in public spaces, demonstrating its direct role in enhancing the human touch of public spaces.

## 6. Challenges and Future Prospects

As technology continues to advance, digital trends will play an increasingly important role in the future design of public spaces. The application of Augmented Reality (AR) and Virtual Reality (VR) technologies can provide users with an immersive navigation experience, enabling them to familiarise themselves with the actual space in advance in a virtual environment. Internet of Things (IoT) technology will also be widely used to improve the responsiveness and efficiency of public facilities through real-time data collection and analysis.

Although the digital trend brings many opportunities, it also brings many challenges. First, the cost of technology is a major obstacle, especially for cities and organizations with limited resources. This problem can be solved by adopting a graphic design approach similar to the colorful patterns of Singapore subway stations, and later seeking government funding and public-private partnerships. Second, the rapid upgrading of technology may lead to compatibility issues between equipment and software. A flexible technical architecture and standardized design specifications should be established, just like the Shanghai Bund Taikoo Li guide system under digital transformation, to ensure seamless integration and interconnection between different systems. In addition, digital design needs to consider data privacy and security issues, and users' information security should be guaranteed by adopting strict data protection measures and user consent mechanisms.

While promoting the trend of digitalization, sustainable development and innovative design thinking should not be neglected as well. Digital graphic design should focus on environmental impact and adopt energy-saving technologies and renewable energy to reduce carbon footprint. Innovative design thinking also includes the integration of a multi-sensory experience, which enhances the accessibility experience through the synergy of multiple senses such as vision, hearing and touch. Overall, sustainable development and innovative design will drive the application of digital graphic design in public spaces, not only enhancing the user experience, but also contributing to the building of green smart cities.



## 7. Conclusion

As space designer Frankie Fan says, the core issue of design ultimately comes down to responding to human needs [8]. Despite the advancement of digital technology such as digital media and interactive technology in design and creativity, it is important not to be overly optimistic. Instead, we need to reflect on the social and cultural impacts of the use of technology. We need to examine examples of the rapid development of technology and civilization in contemporary society that have already occurred in people's daily lives.

In the contemporary information society under globalization, facing increasingly complex problems, and even the impact of those that may cause the "paradigm shift" effect, it is more necessary to solve the problem through the "humanistic civilization" value thinking, in which there is significant room for the participation of design. Currently, the design industry is gradually shifting from the exploration of form and style to a more concerned "people-centered" problem-solving methodology, the so-called "design thinking."

Regardless of the development of media, technology, and social systems, the core issue of design is to respond to the needs of people, i.e., from the perspective of the user, and to propose practical and innovative solutions through the construction of empathy in the design process.

## References

- [1] Krampen M. Signs and symbols in graphic communication[J]. *Design Quarterly*, 1965 (62): 1-31.
- [2] Normoyle, C. (2019). A blended perspective: Social impact assessment in graphic design. *Dialectic*, 2(2).
- [3] Salzano E. Seven aims for the livable city[J]. *Making Cities Livable—Wege zur Menschlichen Stadt*, 1997: 18-20.
- [4] Bestley, R., & McNeil, P. (2022). *Visual research: An introduction to research methods in graphic design*. Bloomsbury Publishing.
- [5] Colourful graphics to help people with dementia identify underground exits. (n.d.). ZBSchools.sg. <https://www.zbschools.sg/stories-23077>
- [6] Intelligent Guide System\_Intelligent Shopping Mall Construction Solution\_Intelligent Guide System\_Chimage Information. (n.d.). Intelligent mall navigation system\_AR navigation guide\_intelligent signage system\_Chimage Information. [https://1000mu.com/news/detail/4a03e140-a9a0-4137-9f87-70aa59c9064a\\_0](https://1000mu.com/news/detail/4a03e140-a9a0-4137-9f87-70aa59c9064a_0)
- [7] Merritt, K., & Zhao, S. (2021). An innovative reflection based on critically applying ux design principles. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 129.
- [8] Design should be based on humanistic care and explore the modern spirit of Chinese cultural thinking-Frankie Fan.(2018, November 9). TDRI. <https://www.tdri.org.tw/17271>