The Interpretation of QR Codes from the Perspective of Pierce's Semiotics

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Abstract: As a new favourite in the digital age, the emergence of QR codes has brought great convenience to human life. The QR codes symbols composed of geometric figures have the ability to carry meaning. Based on Peirce's semiotics, this study explores the relationship between the referents of QR codes, the derivation of signifier process and the communication process. The research finds that: (1) Icon, index and symbol are in a dynamic relationship; (2) The derivation of of signifier process of QR codes depends on the "interpretant"; (3) The communication process of QR codes is mostly culture-based. Through the interpretation of QR codes, this study aims to deepen people's understanding of QR codes and to help them better interpret the meanings implied by QR codes.

1. Introduction

With the rapid development of Internet technology, the emergence of "Quick Response Code" has become an indispensable part in people's lives. At present, with the progress of technology, the presentation of QR codes has gradually pursued the characteristics of art, and designers have gradually turned the functional benefits of QR codes patterns into decorative benefits. With the popularity of smart phones, the application prospect of QR codes will be more and more broad.

Cassirer states that "Man always lives in a physical universe full of symbols, and the universe is essentially made up of symbols." Language, myth, art and religion make up the world in which we live, and these symbols, grown out of human experience, weave a network of symbols of great complexity and meaning." In the process of designing QR codes, designers constantly revise the graphics to stabilize the effectiveness of its symbol "communication", that is, let the audience understand the meaning conveyed by QR codes through the action of "scanning code". As a symbol, QR codes is used in multiple fields depending on the purpose of consumer. Based on this, this study will use Peirce's semiotics of "Triadic Theory" to interpret the relationship between the objects referred to by the QR codes, the derivation of the symbolic process, and the communication process.

2. The Connection between QR Codes and Peirce's Semiotics

QR codes presents an intuitive form and implies the designer's thoughts and conceptual consciousness. Based on this, the presentation of QR codes has a symbolic indicative significance. In addition, the action paradigm deduced by the action process of "scanning code" has achieved the

meaning and purpose carried by the QR codes.

As the founder of contemporary semiotics, based on logic and category theory, American pragmatic philosopher Charles Sanders Peirce defined a symbol as "a sign or symbolic representation that represents something to some extent or in some capacity" [1]. According to him, "semiotic activity" includes symbolic representation, symbolic object and symbolic interpretation. Taking a car model as an example, the pattern of the model (symbolic representation) is associated with the car in reality (symbolic object), and then the meaning of the car is reflected in the mind (the interpretation of the symbol). If we look at a symbol from the relationship between the symbol and the object to which it refers, it can be divided into three categories: Icon, Index and Symbol. Icons are the most primitive symbols (such as animals painted on walls by cave men) that have the characteristics of non-verbal symbols. An index means that people look for a symbol that can represent an object from something associated with it (for example, smoke is a symbol of fire). Symbols are the result of conventions (such as traffic rules: stop on red and go on green).

Interpretive term is the core element of Peirce's semiotics, which refers to the process of perceiving, interpreting and criticizing symbols. Peirce also divided the interpretive term into three parts: direct interpretive term, dynamic interpretive term and ultimate interpretive term. A direct interpretive term is the first impression that people have of something. The dynamic interpretive term is the actual consequence of the symbol to the interpreter. The ultimate interpretive term is the interpreter's complete impression of the symbol.

Peirce's semiotics extends the field of study to non-verbal signs; in other words, Peirce's conception of semiotics involves a theory of signs in the most general sense [2]. The essence of a symbol is that "from the proposition that every thought is a sign, every thought must point to its corresponding object and determine its object"[1]. QR codes code is the symbolic carrier of science and technology. The process of decoding the QR codes symbols by the audience is the process of generating the meaning of "interpretation item".

Peirce's "Triadic Theory" of semiotics is explained in the scanning process of QR codes. The geometrical composition of the QR codes is the "symbol" proposed by Peirce. The things that appear in the process of scanning the code (payment page, video, audio, etc.) are the "objects" referred to by the symbols, and the audience (interpreter) generates a certain understanding of the QR codes, that is, the "Interpretive term". Therefore, the scanning process of QR codes is actually the meaning process of symbolic expression [3].

3. The Analysis of the Relationship between QR Codes Symbols and the Referent Objects of Peirce's Semiotics

According to the above "Triadic Theory" of symbols and its three categories of symbols, Peirce's semiotics is based on logic, and the "triadic" relation of symbols presents is presented in the Firstness, Secondness, and Thirdness of its category theory. As an independent being in itself, the Firstness does not indicate any object; the Secondness is the association of one thing with another based on brute force; and the Thirdness is a means of mediation, without which the connection between the Firstness and the Secondness would be meaningless. Based on this, the triadic relationship of categories is that the Thirdness contains the Firstness and the Secondness, and the Secondness contains the Firstness. Therefore, the Icon is a first-level symbol, the Index is a second-level symbol, and the Symbol is a third-level symbol [4]. However, these three can be converted into each other. As Peirce argues, "It is difficult to find an Index that is absolutely pure, or a Symbol that is not indicative at all[5].

4. The QR Codes Symbols and the Infinite Derivation of Peirce's Semiotics Process

The process of symbolic reference in QR codes is the ideographic process of its symbols, that is,

the process of generating meaning in QR codes symbols. In the symbolic process, the interpretive item is the extension of the symbol, which in turn forms a new symbol. The "Triadic Theory" of symbol illustrates a characteristic of the ideographic process, that is, symbols do not exist independently, and they must be associated with another symbol in order to have an ideographic function. The interpretability of a symbol is determined by another pre-existing symbol, which is the infinite derivation of the Peirce's semiotics [6].

In 1906, Peirce further classified interpretive term into Intentional interpretant, Effectual interpretant, and Communicational interpretant or Cominterpretant. The following takes the specific QR codes as an example to analyze. Both the merchant and the audience (consumers) are symbolic subjects, and there are interpretation items for the QR codes in their thinking. First of all, the intentional interpretant refers to the audience's cognition and understanding of the QR codes is the trading rule, that is, the truth of "spending money on shopping". The effectual interpretant refers to the fact that the recipient (such as the person who has not know the QR codes) may not understand why the merchant provides a QR codes to the consumer due to the backward economic and technological development of the country or region. Then, the cominterpretant refers to its own limitations from the perspective of QR codes design. However, QR codes are already in the stage of high frequency use in people's lives. Finally, the QR code becomes the external expression of the trading rules in each other's minds[6].

Then the intentional interpretant from the merchant and the effectual interpretant from the consumer are smoothly integrated, and the consumer understands the meaning of the QR codes, that is, the effect of the smooth transmission of a symbol is achieved, and the communication is successful. On the contrary, the absence of cominterpretant causes the thinking of the merchant and the consumer not to be at the same level, the intentional interpretant can only stay in the thinking of the merchant, unable to merge with the thinking of the effectual interpretant, the symbol transmission fails, and the communication fails, and the consumer's thinking generates different interpretation terms, which are infinitely diffused, forming the interpretation term 1, interpretation term 2, interpretation term N.

5. The Communication of QR codes Symbols under Peirce's Semiotics

Mead believes that the real way of communication in human society is through symbols [7]. French semiotician Pierre Giraud P. put forward in his *Introduction to Semiotics*: "the main function of symbols is to spread ideas by means of information" [8]. Peirce's semiotics is different from the classical communication research paradigm, which mainly starts from the perspective of interpretation and interaction of symbolic meanings, discusses various issues of communication by studying the production and interaction of symbolic meanings, and forms a unique view of communication models. Based on the "interpretive term" in Peirce semiotics, Zhao Xingzhi believes that "the dissemination of symbolic meaning is a dynamic and open process, and the extension of symbolic meaning depends on the interpreter, and if the interpreter does not take the initiative to stop interpreting, the extension of symbolic meaning will continue, based on which the development of symbolic meaning depends entirely on the interpretation of symbolic meaning made by the interpreter and the sender of symbols"[9]. Based on this, it can be seen that the initiative of the communication subject plays a decisive role in the interpretation of symbolic meaning. In Peirce's communication thought, in order to study how symbol interpretation and symbol representation are realized, we must first understand the form and process of information transmission with symbol as the carrier, and this process is dynamic.

The application of QR codes provides opportunities for the coverage of the audience and the dissemination of the effect, and the all-media communication based on QR codes technology has realized the leap from "cross-border" to "borderless" [10]. Nowadays, digital communication is the

main development trend of reading methods in the Internet era. Some publishers or writers thus print QR codes in their books in order to provide audiences (readers) with an effective means of reading in this way and enrich the way of literary knowledge dissemination. Based on Peirc's semiotics, the significance of QR codes symbols is how people use them to communicate information, share meanings, and build communities of meaning. The extensive use of QR codes in many fields provides new opportunities to realize the dissemination of culture [11].

6. Conclusion

This study starts from the semiotics of Peire to interpret QR codes. By analyzing the relationship between the objects referred to by QR codes, the derivation of the symbolic process and the dissemination process, it is found that: (1) the icon, index and symbol are in a dynamic relationship, and there is no absolute exclusion among them; (2) In the symbolic process, the "process of meaning" of QR codes is mainly achieved through the action of "scanning the code", and its derivation depends on the "interpretive term"; (3) The main subjects of the communication process of QR codes symbols are mostly the senders and receivers of symbols, and the content of the communication is mostly cultural. Through interpreting QR codes, this study hopes to encourage the audience to better understand QR codes, not only limited to its high-frequency payment and dating functions, but also to understand and analyze the extension of meaning and value behind it.

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