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Ultrasonic Two-dimensional Code in the Use of Marketing

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Abstract

As smartphones have become widely adopted, they have also become a highly popular target for marketing. Quick response (QR) codes are a commonly used tool for pushing marketing campaigns targeting smartphone users. The current study tested a method of transmitting QR code-stored data through ultrasonic waves, and applied this method in three marketing scenarios. The method shifts the current model of QR-based smartphone marketing from "consumer-initiated" QR code scanning to "campaigner-initiated" information transmission. It has the potential to maximize the effectiveness of marketing campaigns because it substantially increases the ease and convenience of gaining information for consumers.

Keywords：marketing, ultrasonic, QR code, smartphone

Introduction

The wide availability of smartphones has put a personal computer in the hands of nearly every person, rendering the Internet an inextricable part of daily life. This ubiquity of mobile devices—as well as the related software that has sprouted up to assist users in every aspect of life—has brought unprecedented levels of convenience.

Of the numerous applications for which smartphones have been used, among the most widespread is marketing, particularly mobile shopping. In this arena, one of the most common means of transmitting product information is through quick response (QR) codes. Scanning these matrix bar codes leads users to further information about a product.

This is referred to as a consumer-initiated action because if a consumer does not take the initiative to scan the QR code, the intended action does not occur. Recently, an ultrasonic QR code technology has been patented. The approach utilizes an "audio barcode" rather than a matrix barcode, and transmits information through ultrasonic waves. This technology will shift QR code-based smartphone marketing from the current consumer-initiated paradigm to a campaigner-initiated one, as the ultrasonic QR code automatically transmits information to device when its user comes within a certain range (from 20 meters to 400 meters). [1] In this study, we investigated how ultrasonic barcode technology may change the current marketing model. To do so, we tested the technology in three scenarios: TV program product placement marketing, TV Commercial, and TV shopping.

Methodology

This study was conducted based on the principles of the TRIZ theory proposed by Soviet scientist GenrichAltshuller, who suggested that innovation should be traceable and possibly have a fixed procedural model. In TRIZ modelling, an S-curve is used to predict the evolution of a system. In contrast to other problem-solving approaches that posit that problems should be tackled from the perspective of existing issues, TRIZ encourages thinking from the final ideality, that is, an approach that traces the causes to the impediments that stop the evolution of a system in an inverse order from the ideal result. Ideality here refers to useful functions without harmful factors. [2]

Based on this principle, we used ultrasonic waves to actively transmit information to a smartphone to examine the approach's potential to replace the current less-convenient QR code-scanning method.

We determined the time from marketing to the actual occurrence of purchasing in existing TV program product placement, TV commercials, and TV shopping models; then, we compared these result with data obtained after implementing the ultrasonic QR code approach.

1. Marketing Scenario: TV Program Product Placement

Product placement marketing has become a ubiquitous element of TV programs in recent years. Products are placed in highly visible locations around sets or used as props in TV programs, often given close-up shots to highlight the brand name. However, such product placement is not effective for all products. For example, an actress in a drama may wear a Tiffany necklace, but the audience would be unaware of its brand unless a character were to explicitly state it. The same difficulty is encountered with clothing and shoes; unless their brands are clearly stated or otherwise displayed, the effect of this marketing method is compromised.

In such scenarios when product details are not obvious, any viewer interested in a product would have to call the production company or search online or in stores to attempt to find the product—an effort that could prove fruitless.

Ultrasonic QR codes offer a solution to this problem. When a product appears on a TV program, information about it can be transmitted through ultrasonic waves to the smartphones of viewers. Those viewers who have connected a credit card to their smartphone and the relevant shopping website or app can then purchase the product with a single tap.

For example, in an episode of popular South Korean drama *My Love from the Star*, lead character Cheon Song-yi, played by Jun Ji-hyun, opens a shoe cabinet and takes out a

pair of silver dinner shoes. At this point, if a viewer wanted to purchase this pair of shoes, the fastest way is to search them online. Our test participant was tasked with doing so and subsequently entered two keywords, "silver" and "high heels," into a search engine. The participant browsed through the search results until finding the shoes, then placed an order for them and made the accompanying payment. The entire process took approximately four minutes.

The shoes in question represented an item which is relatively easy to find online. For other products, such as knit jackets and trench coats, the time needed to search and select an item for final purchase ranged from 10 to 30 minutes. When the process extends to such long periods, the impulse to buy may fade away completely before the desired item is located.

The disadvantages of this approach stand in stark contrast to the advantages posed by ultrasonic QR codes. With the new technology, the moment a participating product appears on the screen, information about that specific item is simultaneously transmitted from TV to smartphone through ultrasonic waves. The code opens a purchase webpage for the product on the smartphone, enabling the transaction to be completed within one second. This mechanism eliminates the time previously required for searching and thus seizes on the optimal moment to encourage and facilitate impulse buying.

2. Marketing Scenario: TV Commercial

TV commercials transmit information through audio and visual stimulation; their effect is immediate and powerful. Combined with their large and geographically dispersed viewership, this makes TV commercial an effective medium for rapidly raising brand or product awareness in a short period of time. TV commercials adopt numerous tacks in appealing to the audience, such as through heart-touching images, appealing music, and entertaining content.

However, TV commercials are limited by the temporary nature of product information and the time available for presentation. Accordingly, making a full presentation of the functions, features, and specifications of a product is typically not possible. [3] By contrast, airing a TV commercial in synchronization with the transmission of product information through an ultrasonic QR code enables related information to be retained in viewers' smartphones, supplementing the otherwise insufficient TV commercial. Thus, this mechanism adds value to the already expensive model of TV commercial marketing.

Most TV commercials are required to communicate product features and brand appeal in a running time of 30 seconds or less. In our test, when a TV commercial triggered and catalyzed the desire to purchase a food or beverage item, the viewer was able to make a nearly-immediate purchase at a nearby convenience store. However, if the product was a watch, dress, or car, generally longer travel to a specific store was necessary to make a purchase.

In the case of an alcoholic beverage, our test participant received information from a TV commercial—without an ultrasonic QR code—and walked approximately 50 meters to a nearby 7-Eleven to purchase the product. In the case of a watch, our test participant needed to drive approximately 20 minutes to a boutique shop to purchase it. Furthermore, if the commercial were to air at midnight or other time outside business hours, viewers would not be able to purchase the item until the next day. Thus, the urge to purchase could be fulfilled only after a certain period of time and through a specific shopping process.

By embedding an ultrasonic QR code, the TV transmits product information to the smartphones of viewers who are watching the commercial. Specifically, a product page is opened, enabling viewers to finalize their purchase of the advertised product within 1 second. Be it for a cleaning product, food item, car, or even house, ultrasonic QR codes can be used alongside TV commercials to provide detailed product information and effectively reduce the time viewers must spend in order to locate and potentially purchase the product.

3. Marketing Scenario: TV Shopping

In Taiwan, a considerable gap exists between the promotion of products on TV shopping channels and viewers finalizing their purchase of these products. First, a presenter demonstrates a product on TV. Subsequently, a prospective buyer dials a toll-free number and gives the corresponding product code to place an order, after which they must provide their credit card number and authorization code to make a payment and finally give a delivery address. [4]

Through the ultrasonic QR code, while a presenter demonstrates a product, related product information can be transmitted directly to the viewers' smartphones, including a button for the instant purchase of the item.

Due to the fact that the purchase can be finalized with a single tap, this method effectively seizes upon the impulse-purchase moment, which the existing marketing and sales methods cannot achieve.

The current study tested the existing advertising and sales method on a facial mask product sold through a TV shopping channel in Taiwan. The block promoting the product ran for approximately 40 minutes, during which the product was introduced and how to use it as well as its effects were introduced. The product code and toll-free hotline were shown on the screen at regular intervals, with buyers needing to dial in, give the product code, their credit card number, and its authorization code to finalize the transaction. Our test participant took 10 to 20 minutes to complete the procedure.

When an ultrasonic QR code is embedded in the program, product and pricing information is sent to the viewer at the moment the product appears on the TV shopping channel, and viewers can make and finalize a purchase by tapping a single button. This method enables the purchasing process to be completed approximately 600 times faster than the traditional phone call-based practice.

Conclusion

Ultrasonic QR codes send information to potential consumers' smartphones through inaudible audio waves and enable one-click purchases, drastically reducing the time traditionally needed to complete such a transaction. This marketing mode effectively seizes the impulse-purchase moment—something difficult, if not impossible, to achieve using existing methods.

Current scannable QR code-based marketing relies on consumer-initiated behavior; if a person does not scan a QR code, it fails completely in its intended function of disseminating information. Ultrasonic QR codes, by contrast, constitute an active campaign. With them, campaigners send

product information through ultrasonic waves and consumers receive the information without taking any action; then, if they are interested in the product, they can complete the purchase transaction within one second.

This innovative technology can be used in a wide array of marketing scenarios beyond the three investigated in this study. From ticket sales to outfits at a fashion show, the carrier is the "air," so to speak, and therefore the potential is unlimited.

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