

The Silent Invasion of the Matrix : Q(uee)R-coding Public Visual Spaces

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Abstract

In an increasingly hybrid world, the digital grows more pervasive. 2D barcodes called “QR codes” epitomize the tendency as they flourish in everyday environments. One of their practical applications is to take users directly to a webpage upon “scanning” them with a compatible mobile device. We analyze uses of QR codes in visual communication ranging from shop signs to advertising campaigns. Serving as interfaces between the physical and the digital, matrix codes are signs aimed at two distinct types of interpreters. For a non-human interpreter, the signified is univocal: it points to precise information and may operate technically as a “switch.” For a human interpreter, the signified is equivocal: visually indecipherable without the proper equipment, the code is a symbol of and a prescription to use new technology. As visual and technological artifacts, matrix codes are hybrid objects that perform a double mediation, technical and semiotic, intertwining the functional and aesthetic. Their use in public communication at an early, trial-and-error stage requires that producers and viewers negotiate the double mediation and integrate it into their visual communication strategies and experiences. The hybridization with machine code also queers public spaces in a Harawayan sense.

Keywords

2D barcodes ; QR codes ; computer-mediated communication ; visual communication ; machine communication ; queering.

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1. Introduction

By the turn of the decade, with little ceremony or explanation and without the usual techno-buzz around ICT innovations, strange symbols had begun blossoming in North American and European public settings, on posters, on signs, on flyers, in magazines, in the streets, and even on bananas. They became ubiquitous before the public knew what to call or how to use them. A product of the Japanese automobile industry, the symbols—the most common of about 50 variants on the idea of 2D product codes—are called “QR codes” for “Quick Response” (Kan, Teng, and Chen, 2011). Originally referring to supply-chain thinking, their intriguing name stresses a communicative, interactive purpose.

Not totally alien, the symbols are akin to the varied barcodes consumers see on product packages, parcel delivery labels, and boarding passes, the kind of indecipherable visual symbols the public encounters in the logistics of daily life as artifacts become mechanized and automated. The *puzzle* was that they suddenly invaded the urban landscape in the territory of human communication, the semiotic sphere (Morrison & Arnall, 2011). Their sudden prominence produced uneasiness or “malaise,” as if suddenly cartoon characters appeared in real life, crossing into another code the way “toons” did in the movie *Who Framed Roger Rabbit* (1988).

The appearance of QR codes invites theorizing about ways to engage with the proliferation of machine-readable symbols, and the apparent semiotic code crossing into venues of ordinary (human) communication with an attendant “malaise” calls for examining the irruption of machine communication in the semiosphere.

2. Presentation of the object of study

2.1. Barcodes

Machine-readable symbols called *barcodes* were invented in the middle of the 20th century, named originally to draw an analogy to Morse code. Instead of dots and dashes, barcodes have stripes or *bars* of different thicknesses. One sub-class of barcodes is one-dimensional: the familiar barcodes at the supermarket checkout line. They are 1D because the information encodes across just one dimension, typically the width of the bars. A second sub-class specific here is two-dimensional, a version with information coded across width and height. The 2D codes typically look like a grid, or a matrix in mathematical terms. The main difference

between 1D and 2D codes is the *density* of information they encapsulate in a surface. A 1D barcode can typically contain a reference number but a 2D code of a similar size can hold all the alphanumeric information appearing on an ID card, for instance, or even—in the popular explanation—a whole political speech.¹ In the most common use in public communication, a QR code contains just one URL, generally shortened and directed through a tracking process.

2.2. Symbologies

Barcodes come in various “types” or “formats,” following what specialists call *symbology*, a set of rules that specify how information encodes in a graphic format. Some have become standards, and popular 2D symbologies include PDF417, QR code, Datamatrix (known as Flashcode in France), Microsoft Tag (High Capacity Color Barcode), and MaxiCode developed at UPS.

Denso, a Toyota subsidiary, created QR code symbology in 1994 for tracking car parts, then released it into the public domain in 1999. One of its characteristics is a high tolerance for alteration. A key requirement for barcodes is accuracy. Because they serve logistical purposes, wrongly decoding their information can have financial consequences. The codes must also be decodable at high speed, sometimes in poor lighting conditions and with distortions in reproduction, viewing angle, and other sources of information noise. All barcodes build in redundancy and keys for error correction. QR codes with up to 30% of their information altered are still readable², meaning that like holograms they can be “chipped” and still render the whole picture or message. For instance, an altered QR code found on a bulletin board in Université Laval was perfectly decoded when scanned (see Fig. 1).

¹ Abraham Lincoln’s *Gettysburg Address* (1863) is one example of how much text an average-sized 2D barcode can contain.

² For further details, see Denso Wave Inc., « QR code features », <http://www.qrcode.com/en/grfeature.html>



Figure 1 — QR code sticker on a bulletin board.³

The accuracy despite alterations opened up opportunities for graphic designers to insert graphics *within* QR symbols, *stylizing* the code to make it less machine-like and more human in appearance. They reach the maximum human intervention by trial-and-error, continuing to alter the image as long as the code keeps scanned properly. In a good example, the QR code a marketing agency created for Louis Vuitton naturalized the dry, cold matrix into something warm and organic that looks like a playful, Pac-Man labyrinth (see Fig. 2).



Figure 2 — A creative QR code designed by SET QR⁴.

³ All photographs are the work of the first author or students at Université Laval.

⁴ For more examples, see : <http://pinterest.com/setqr/>

3. Conceptual framework

QR codes pertain to computer-mediated communication (CMC) because communication between the author of the poster—a term we use generically for all visual media where authors “post” QR codes—and the intended public requires the mediation of a computer or a software-enabled device. But QR codes as a form of CMC complicate the classic view of the computer as a channel (medium) through which communication occurs (Herring, 1996), so that one can understand the algorithmic machine as a partner (actor) in the interaction. The unit of analysis is not a dyad (human-human, human-computer) but a triad (humans, computers, humans). CMC becomes a communication process involving humans and digital devices tied together in evolving networks.

Matrix codes seem to target a machine to read them, in principle only to reveal the encrypted message to the user-viewer, or in other words to serve as a connector to a digital document such as a web page. In practice, scanning the code also sends information to a third party in the interaction: those monitoring the impact of the campaign that has presented the code. Depending of the application used, the QR code can send extensive information about the viewer, location, and time.

Like other barcodes and machine-readable symbols, QR codes also pertain to “machine communication,” a process of symbolic interaction taking place among machines. Although the human hand can reproduce a code (see Fig. 3), a machine necessarily generates it and a machine reads it. One user calls the experience of viewing the codes “like looking inside a machine.”⁵ Matrix codes serve as a boundary object (Star & Griesemer, 1989), an interface between human and machine worlds.

⁵ Richard Doherty, Academic Technology Resource Coordinator, University of Illinois at Chicago, personal communication, 3/04/2011.



Figure 3 — Hand-drawn QR-code, temporary installation in the MediaLab lobby, Massachusetts Institute of Technology, May 2011.

QR codes are an extension in the long history of visual forms (Barnhurst, 2002). Form in communication studies examines visual artifacts as elements that convey larger metaphors for how society works by alluding to the network of relationships within the image and surrounding its production and display (Barnhurst & Nerone, 2002). Formal theory from visual communication also considers how visual designs operate as signs that hail to a public, and matrix codes are signs that hail two distinct types of interpreters.

For a non-human interpreter, the signified is univocal: it points to precise information and may operate technically as a *connector*. For a human interpreter, the signified is equivocal and multiple. At a denotative level, the matrix calls attention, as in “Hey!” and implies something the viewer can do to connect and interact, suggesting the imperative, “Scan me!” The display affords the viewer the option of scanning, its main trait is its being “scannable.” But matrices remain indecipherable without the proper equipment, and so the visual code is like an esoteric symbol requiring a translator. Even without a key to the latent code, the display invites viewers to find manifest meanings at the connotative level. In the barcode imaginary, matrix codes add other layers of meaning. The square dots evoke pixels, pixels denote the digital, and the digital connotes technology. QR codes are iconic symbols of

technological modernity or, in other terms, geekiness. The “tag” (as it is sometimes called) then acts as a tribal identifier. It can also be normative, prescribing the adoption of mobile media technology, and performative, engaging the viewer in the use of technology as futuristic action.

Finally, QR codes “queer” experience by challenging boundaries between supposedly opposite categories (Lykke, 2000): physical and digital “documents,” machine and human “reading,” and private and outwardly performed “messages.” More than just innocently connecting mobile device users to websites and databases, the codes connect together realms once considered distinct. Scanning a code is the analogue to “clicking,” a gesture belonging to hypertext culture that extends beyond the surface of the digital screen. The code bridges a gateway between the physical and the digital, in a striking example of actual/virtual hybridity (Proulx & Latzko-Toth, 2005).

Each node of the CMC triad subverts older binaries and transgresses given expectations, making concrete manifestations and operations of the “cyborg” as a process at work in post-modern societies (Haraway, 2006). QR codes may be cyborg themselves, hybrid signifiers that fuse the human with the non-human. Haraway asserts that cyborgs “are everywhere and they are invisible” (p. 120). QR codes are everywhere and increasingly *visible*, but they occult their deeper networks in a cloak of playful humanity.

4. Research question

As visual and technological artifacts, QR codes are hybrid objects that perform a double mediation, technical and semiotic, intertwining the functional and aesthetic. Their use in public communication is still at an early, trial-and-error stage. Producers and displayers negotiate that mediation and integrate it into their visual communication strategies, hailing viewers to join in cyborg experiences. To begin understanding QR codes, we examine the QR codes themselves. What traces from negotiating the double mediation do producers leave in the visual form and signification of the QR code? To find answers, we focus on the designs of QR codes as visual communication strategies.

5. Method: Cases & Patterns

Our approach combines collecting a corpus of photographic images with analyzing the visual and textual evidence within the designs and discourse implied in their surroundings. A team of students aided the

principal author in gathering 107 cases from public spaces in the USA and Canada from August 2011 to April 2012. Each case groups together the QR codes associated with a poster or series of posters that form part of the same public communication campaign.

After collecting the images, one author grouped them into cases and then categorized the cases to identify patterns, the types of uses for QR codes in the corpus of cases. The second author reviewed the images independently, and the authors then confirmed the case groupings and patterned “types” by consensus.

6. Results: A visual typology

As a rule the producers and displayers of QR codes employed just one code per poster or document. In each instance the code had one main use. We propose the following typology of QR code uses in visual public communication:

Type I. The poster includes a discrete code, simply added somewhere in the picture. A Type I code is a mere **connector**, a hypertextual interface that stands by itself. The QR code may appear in an unobtrusive position, rather than the top or center of the design, marking its role as a separate element and mode of interacting with the poster. Designers find more or less elegant ways to fit the code in the general visual economy of the poster. In most cases, the code appears as a “foreign body,” a graphical addition in the manner of, say, the 1D barcode within a white box interrupting the photo of a magazine cover.

The designer of a poster for a swimwear shop in Quebec City has positioned the code under the Internet address of the merchant’s website (see Fig. 4). The composition contains four structural areas, divided horizontally and vertically along the two axes of symmetry. On the right half, a female model exhibits a bathing suit, in a lascivious attitude that highlights the curved lines of her body. The left side of the poster is, by contrast, purely textual except for the QR code. The horizon line separating the sky from the sea acts as a sharp straight ruler that separates the upper and the lower part of the poster where the Internet address stands in literal and QR-coded forms. The text follows the edge of the body, in a “V” shape that seems to converge toward the code, making it visible but also effectively integrated in the fluid lines of the poster. It seems an extension of the text that precedes it.



Figure 4 — A sign on a shop closed for renovations in a shopping mall, Quebec City.

Type II. A Type II code is a content **container**, an integral part in or pattern-setting structure for the whole design, so that it participates directly and fully in the visual strategy or signification. The square shape of the QR code, for instance, may become itself an element in the design or a structuring aspect of the layout, as in a sign found at the entrance of a security check zone of a U.S. airport (see Fig. 5). The visual features of the QR code, including internal square patterns, serve as leitmotiv for the order of the whole: a recursive grid made of squares-within-squares. The code and its squares connote strictness, apropos of the rule-bound air transport system. To that semiotic system, the text adds an explicit prescription to “Scan the code.”



Figure 5 — A sign by U.S. Federal Transport Security Agency, Cleveland Hopkins International Airport

Type III: In a third type, the poster itself is the code, sufficient in itself, so that its display encompasses the entirety of the visual communication. A Type III code is a **conveyor**, the main figure in the visual display. The presentation allows the code to stand alone, doing the manifold work of design, image, and content. In prominent cases the code is bare, simply displayed on a wall, perhaps in huge dimensions as on the sidewall of a printing company in Chicago (see Fig. 6). The only other elements on the poster are the company logo and the injunction to scan the code, but both look like footnotes, reversing the role of Type I connectors.



Figure 6 — A giant ad on the Palmer Printing, Inc., building, Chicago

The matrix in another instance occupies 100% of the sign, but embeds other visual elements, leveraging the redundancy of the code for other work. In a sign appearing on the wall of a sushi restaurant in Quebec City, a “flying fish”—the logo of the restaurant chain—appears at the center of the code (see Fig. 7). The red of the fish contrasts strongly with the otherwise black-and-white matrix. Underlining the intertwining of the two graphic objects, a square dot stands in the middle of the fish, and the fish’s black shadow inserts itself between the other square dots of the matrix. No text is visible, but the iconic signifier—the fish—adds life to the machine-like code and, because it is recognizable as the restaurant’s logo inside of the restaurant, acts as caption for the cryptic code.

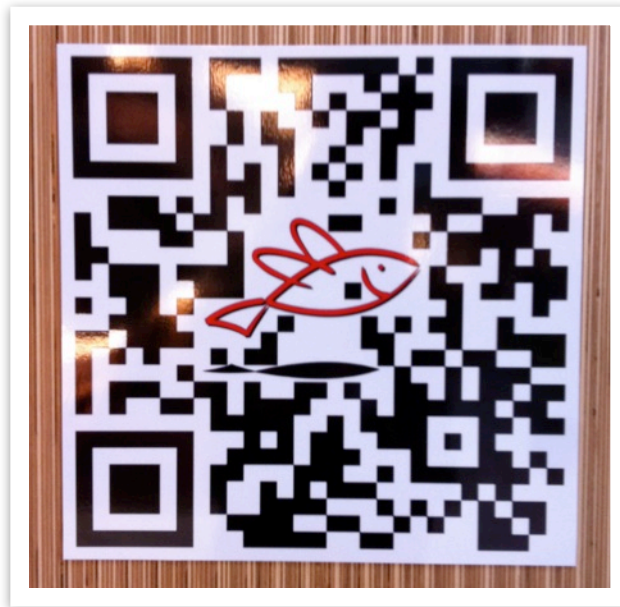


Figure 7 — A sign in a Sushy Fly restaurant, Quebec City

As with any taxonomy, the three types we identified have fuzzy boundaries. All codes play multiple roles as connectors, containers, and conveyors. Codes that incorporate imagery within the square, for example, may appear as a discrete element, as a pattern-setter, or as the poster's entirety. The typology identifies the main clusters or patterns along a continuum that ties transport with ritual signification (Carey, 1989). The continuum also bridges the use of the QR code in formal and semiotic senses.

7. Conclusion: Queering the Machine

The use of QR codes in public communication exemplifies an emerging phenomenon where “machine communication”—usually a tacit, latent process—operates in full light and runs together with human communication. The codes *need* to be visible; otherwise they would not work. And precisely because the technical artifacts invade the field of vision, they acquire a semiotic potency for viewers. Our first approach to the double mediation is by looking at how creators have dealt with the QR sign as design. Despite an apparent consensus about using a single code per poster, that code plays a variable role in the economy of the visual text. The typology of uses—connector, container, and conveyor—plays hide and seek with another continuum ranging from mechanical referent to meaning-laden signifier.

Further ethnographic research could test our taxonomy. How do viewers interact with and make sense of QR codes? Interacting with shop owners and others who display posters containing QR codes could reveal how they view and employ them, especially when interacting with the public. And fieldwork with producers could illuminate a third and originating node for relationships QR codes intermediate. Formal and semiotic analysis can only hint at some networks of relationships among signs and the persons engaged in communication—the imperative Scan Me, the invitation to playfulness or technology adoption and so forth.

The course that QR codes have followed as they proliferate is “queering” in the broadest sense. They subvert, hybridize, or cross the borders between physical and digital media, between organic and cybernetic eyes, between human and machine communication, and between visual communication unmonitored and under surveillance. QR codes are one more instance of a broader current in Western culture that protests too much about its “normality” and against all things queer, while assuming greater hybridity and blending.

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