

## TECHNOLOGY

# QR Codes for the Dead

Graveyards are becoming smart spaces, but will today's technology last for eternity?

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[FOREVER HEADSTONE](#)

The QR code's history is intrinsically tied to a quest for efficiency, thus mirroring the barcode's trajectory. Drexel graduate students Norman Joseph Woodland and Bernard Silver patented the barcode in 1952, but their invention wasn't fully realized until the 1960s, with the birth of the KarTrak system, implemented by the railroad industry to track the contents of individual railcars. Barcodes were then commercially popularized with the birth of the Unique Product Code, or UPC, in the 1970s as a way of automating cashiers' labor, ostensibly saving time while preventing the carpal tunnel-inducing repetitive motions of manually entering numbers. But barcodes can only contain roughly twenty alphanumeric characters, thus limiting their applications. In 1994, a Japanese subsidiary of Toyota called Denso Wave released the "quick response" or QR code, allowing more information to become embedded into objects. Unlike the PDF417 and other earlier 2D barcodes, the QR code decodes information using image sensors rather than by utilizing a linear scan. Their ability to be read by smartphones means that QR codes are now being used in numerous ways, sometimes tied to long-standing physical structures. Although QR codes are primarily used to facilitate short-term

commercial interactions, now they are being integrated into places associated with posterity.



A variety of QR Codes, from DENSO Wave's history of the technology (DENSO Wave)

While they were originally created for use in the Japanese auto industry, in order to track motor vehicles during the manufacturing process, QR codes are now embedded in everything from wedding invitations to subway billboards. Since 2010, smartphones have had the ability to read QR codes, making them popular in many industries. QR codes have especially caught on in advertising, where corporations use them to lure consumers to their websites, which in turn allows those companies to learn more about shoppers by grabbing their browsing histories and other digital crumbs. Rather than merely tracking objects that move through market circulation and exchange or linking individuals to websites through short-lived advertisements, QR codes can track and map networks of social relationships over time while also linking users to rich content. Their ability to trace relationships, connecting various information points about individuals and their networks, has raised privacy and security concerns, particularly as malevolent QR codes spread malware. But the possibility of QR codes' obsolescence, as well as the potential ephemerality of the digital connections they produce, have not enjoyed sufficient discussion.





QR codes sometimes appear in unlikely places, on everyday objects rather than on advertisements or billboards. So common are these weird encounters, a [Tumblr](#) dedicated to ill-conceived QR code embedded things has emerged, with photographs of QR codes in the wild—on teabags, the backs of Subway employees' T-shirts, and even on bananas. When the advertising campaign ends or a company nosedives and disappears, the QR code itself may endure on these materials. If they are placed on long-standing structures or tangible objects, the QR code becomes a part of the architecture. What does it mean to use QR codes as points of connection for the *longue durée*? What happens to digital objects after they lose their smartness?



A QR code-emblazoned pet memorial (Forever Headstone)

An example of [QR codes on headstones](#) may offer an entry point to begin thinking through these questions. Gravestone monuments, after all, are built of sturdy matter such as granite, fieldstone, and marble—materials imagined to last well into the future. Given the proliferation of memorialization websites and the use of social networking profiles as mourning spaces, it may come as no surprise that QR codes now appear on headstones, linking graveyard visitors to online tributes to the dead. The frenzy of connectivity fomented by the Web 2.0 ethos has apparently led to a market for interactive, digitally connected graveyards.

[Living Headstones](#), a subsidiary of the Seattle-based gravestone and monument company called Quiring, claims their “memorial blends the timeless tradition of

granite headstones with the newest technology available. We provide an interactive ‘living’ memorial that is a legacy for future generations.” According to Living Headstones, families now often live in geographically disparate areas, meaning that frequently visiting gravesites is not a possibility. QR codes on headstones link a particular gravesite in one geographic location to a virtual public space that can be accessed from anywhere, allowing graveyard visitors and those from afar to link to the same memorial website while inducing a sense of shared experience. While Living Headstones serve as digital spaces for photographs, comments, obituary articles, genealogical information, and links to social networking websites, they are also situated in stone. The granite headstone, explicitly linking the body of the deceased to a physical geographical space in a graveyard, belies the networked space of the memorial website. Today, multiple companies provide QR codes that attach to physical headstones and link family members and friends, but also random graveyard visitors, to memorial websites or other information about the deceased. Children can now learn all about the grandfather they never met while visiting his gravesite. In fifty or even one hundred years, so the idea goes, people will be able to scan QR codes with their devices and learn more about the people buried in a cemetery.



Shrine with QR code (Ishinokoe)

Smart graveyards have long been considered important practical and historical tools; knowing the exact coordinates of each burial plot in a vast cemetery is no easy feat. Much in the way that Geographic Information System (GIS) promised digitally accessible archaeological and historical sites (graveyards among them), so now QR codes become a means of organizing and archiving information. GIS provides spatial analysis of mortuary spaces, both ancient and contemporary, allowing users to map and analyze burial plots, genealogical information, and other

features. Now QR codes can become part of this mapping process as well. In La Paz, a Jewish cemetery in Uruguay, QR codes on every headstone link visitors to information about specific graves. Thanks to the codes, every tombstone's location is known and the curious can even view the cemetery remotely. QR codes on headstones promise access to in-depth personal details about the buried person instead of just generating metadata.

Despite the commercial origins of both the QR code and the barcode, it is difficult to imagine family members placing barcodes on gravesites, essentially marking their dead loved ones as commodities or conjuring images of barcode forehead tattoos from dystopian fantasy novels. QR codes facilitate the sharing of information, but they have managed to distance themselves from a necessary connection to commercial activities. Nevertheless, QR codes only become recognizable symbols thanks to their successful commercial implementation. For this reason, some may find their visible presence in graveyards discomfiting or disrespectful. As a result of such concerns, Arlington National Cemetery debated and ultimately decided against incorporating QR codes as means of linking gravestones to historical information about the dead.

Not only do QR codes raise issues regarding propriety or sanctity, they also connect to issues of privacy. QR codes link everyday objects and services to individuals' mobile devices, and as such they raise issues of surveillance and tracking. Recently, legal scholars Lilian Edwards and Edina Harbinga have advanced the idea of postmortem digital privacy, which concerns defamation, data rights, and murky situations when a dead person's revealed secrets may inflict pain or damage upon surviving family members. QR code-connected online memorials exemplify such privacy concerns. In 2008, a Japanese memorial company called Ishinokoe started advertising QR codes for headstones. Visitors who scanned the code would be led to a dedicated website, replete with photographs and other information about the deceased. For the sake of privacy, only family members and friends with physical keys could actually access the QR code. The code remained hidden behind a locked stone chamber on the physical shrine. Digital Legacys, a Philadelphia-based company that also provides QR codes for headstones, uses a different method. Its customers can set their websites to public or private, either allowing random graveyard visitors access to the digital shrines or not. According to Digital Legacys, "sharing is caring," thus overtly endorsing a moral imperative for the immediate connection fostered by Quick Response codes. To publicly share a loved one's memorial site is in itself an act of love, emphasizing the importance of circulation even in non-commercial contexts. Companies that sell QR codes on headstones must strike a balance between providing a means of embedding and circulating

knowledge while restricting the general public's access to personal information about the dead.

While graveyards have always been potentially public spaces, now it is possible for more information about the deceased to be shared, going beyond birth and death dates or a pithy epitaph. What does it mean if QR codes or other digital headstones can provide intimate information to random visitors? Similar to the kinds of privacy protections offered by social networking websites or by the digital estate planning companies that organize people's digital assets and bequeath them to kin after they die, QR code headstone companies must promise their users that privacy will be maintained. Some customers may want strangers to scan QR code headstones to learn more about the deceased and others may want to ensure that only close friends or family members have access to the websites. The graveyard is a public space and the QR code is obviously visible, but it offers access to encoded information that might otherwise be made private by invisibility or obscurity.

Unlike privacy, the issue of obsolescence is less frequently raised in relation to the QR code. The company called Forever Headstone emphasizes the longevity of QR codes in addition to their ability to connect virtual and physical locations. If carefully affixed to the granite, the company argues that "this plaque will remain attached through all weather conditions, cemetery maintenance, and time." Rather than tracking the circulation of moving objects, as during the QR code's early days at the Toyota factory, the QR code on a gravestone is linked to an object that is supposedly immobile and eternal. The corpse itself may not be going anywhere, but the QR code links the physical gravestone to a wide network of kin members, as well as to a large number of mobile devices and various digital and physical locations.

But no one can predict how long a particular technology will last. QR codes rely on the persistent value of the object in which they are embedded. QR codes rely on many mundane but crucial pieces of infrastructure to continue operating: the computer vision software that detects and decodes the code; the maintenance of links or domain registrations of the associated websites; the ongoing operation of the websites themselves; and even the persistence of the basic infrastructure of the web. But in their gravestone incarnation, they also rely on the continued social value of a QR code-emblazoned headstone. For the system to work, both the person under the stone and the technology linking the physical space to a digital memorial must remain relevant. The value of big data as well as of more affectively produced objects, both digital and not, relies on this kind of an orientation toward the future. Value is contingent upon the sustained recognition of worth.



What happens to these gravestones if the QR code fades, links are broken, or new technology renders QR codes indecipherable? Rather than just maintaining the grass around a burial plot, family members would have to maintain their affective ties to the deceased and his or her physical burial place and digital memorials or remnants. The amount of labor and upkeep required to maintain the links between the QR code and such materials is immense and specialized.

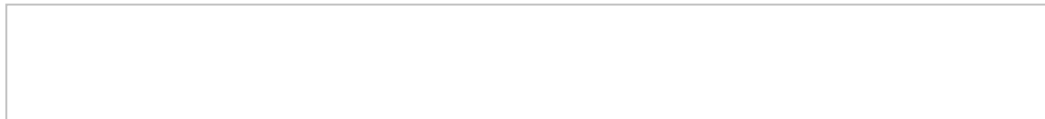
While currently ubiquitous, history offers lessons about what might happen should QR codes become obsolete. Microsoft Tag, initially released in 2010 as a more colorful alternative to the QR code, is now defunct. Most people have forgotten the earlier CueCat, the cat-shaped barcode scanner developed in the late 1990s by the defunct Digital Convergence Corporation. Similar in premise to the QR code, the technology allowed a portable scanner to connect users to websites. But it suffered a major security breach in 2000 due to its poor encryption and ultimately failed on the commercial market, even landing it on a list of PC World's 25 worst tech products of all time. Privacy and security concerns ultimately led to its demise, rendering a much-hyped technology into a specimen for media archeologists and a cautionary tale for other tech companies.



KarTrak codes on an old railway car. The technology was abandoned in the 1970s. (Flickr/[Quinn Rossi](#))

If and when the QR code disappears as a useful technology, it is likely that smart headstones will persist as material rather than digital traces. The KarTrak system, for example, lives on in the faded colorful symbols on aging railroad cars, no longer

readable by modern scanners. The Free Mason, Puritan, or Victorian symbols on early American headstones, even if they have survived for centuries, are now effectively indecipherable. Most graveyard visitors do not know what a beehive, spinning wheel, or anchor signifies. QR codes may become similarly impossible to decode, particular if the technology that renders them readable becomes obsolete. In another century, curious graveyard visitors may wonder what the patterned squares on each headstone are, who put them there, and what they were thinking when they did.



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