



# TRENDS FOR PERSONALIZED CUSTOMER SERVICE IN KIOSKS AND DIGITAL SIGNAGE

A Honeywell White Paper by Rob Hussey



# Abstract

Fig. 1 Self-service kiosk.



As companies strive to connect with their customers on a more personal level, they are making technology investments to help them to know their customers and to provide services and transactions that are tailored to the individual.

Customers expect easy access to information nearly everywhere they go. They talk to digital assistants in their homes to get answers to questions, to automate many of life's tasks, and to transact shopping. Similarly, this raises the bar for companies to more easily connect customers with the information that they are seeking when they are outside of the home. Self-service kiosks (fig. 1) and interactive digital signage solutions are being deployed at an increasing rate, giving consumers a personalized experience even when a company employee is not available to assist.

The trend is also visible in the public sector, as governments have a vision for smart cities that connect citizens to public service announcements and emergency services through digital portals. While many of the current ideas are typically targeted to the public, it would be useful if governments could provide tailored information to individual citizens.

Kiosks and digital signage devices can provide a more personal experience if they can identify the customer. This is commonly done by reading

a mobile coupon that is presented on the display of a mobile phone. In other cases, barcodes that appear on paper statements are often used to link to a customer's account. For more secure transactions, a kiosk can verify a user's identity by imaging a driver's license or a government-issued identification (ID) card.

Manufacturers of kiosks will be pressed to design-in more capabilities, to customize their offerings, and to deliver kiosk products more quickly to their customers. Fortunately, the latest two-dimensional (2D) imaging modules are built with kiosk designers' needs in mind: equipment is more modular, is easier to integrate, and can capture the identity of a user with higher accuracy. Customers can "opt in" to being identified when they present their driver's license or ID card.

This white paper explores the technology that is used to identify customers as the basis for providing them a more personalized and valued experience.

# Customer Engagement Starts with Customer Identification

As a guest of a five-star hotel, you often expect to be greeted by name when you encounter a member of the hotel staff. Modern technology is making this level of personal service possible for many companies, even when the customer is interacting with a machine rather than a person.

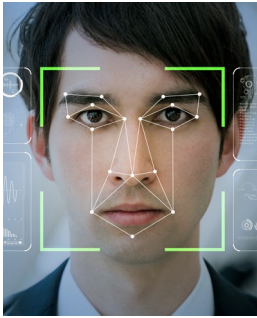


Fig. 2. Facial recognition technology may be used to identify a person via a machine.

## Facial Recognition Technology

Personal engagement starts by identifying the person. Facial recognition by machines has been used in many applications. A camera captures an image of the person and compares features of the face to a database to find the closest match (fig. 2). However, this technology has several drawbacks. The first limitation is social acceptance. Some people in other cultures may consider it a violation of their privacy to be watched, identified, or tracked by cameras. They often prefer to be in control and to present their ID when they want to be identified. Another limitation is that facial recognition cannot achieve the same accuracy as many competing technologies, which we will discuss in this white paper.

## Two-Dimensional Image Reading Technology

2D image readers are ubiquitous in access control applications where it is essential to identifying the people who want to gain admittance. Those who travel on a commercial aircraft have probably witnessed this technology as passengers present their boarding pass at various areas of the airport for security purposes (fig. 3). The boarding pass equipment scans the 2D barcode on the traveler's boarding pass and then relays to the airport personnel the pertinent passenger information.

The International Air Transport Association (IATA) set the global standard for Bar Coded Boarding Passes (BCBP) in 2004. By choosing 2D barcodes that are in the public domain, they adopted an ecosystem of printing and reading solutions that are designed to work interchangeably.

Several types of 2D machine-readable barcode technology were invented in the 1980s and 1990s. Examples include:

- Aztec Code, which is commonly found on European train tickets and airline boarding passes worldwide (fig. 4),
- PDF417 (Portable Data File) barcode, which is a stacked linear barcode symbol commonly found on the back of government-issued ID cards in North America (fig. 5), and
- QR (Quick Response) Code, which is also found on boarding passes around the world and is commonly used in consumer marketing (fig. 6).

No other machine-readable technology has the accuracy of 2D barcodes because the inventors of these codes built in powerful mathematical codes that can detect and correct reading errors. The accuracy of 2D technology is so reliable that the technology is used to detect and correct errors in communication with satellites in deep space. Mathematicians have shown that the probability of a decode error is roughly 1 in 100 million.

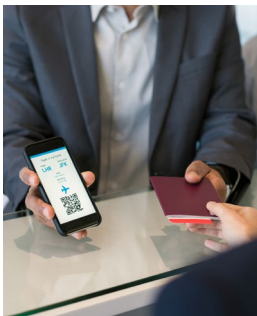


Fig. 3. Electronic boarding passes are often used for airport security purposes.



Fig. 4. Aztec Code data is encoded in concentric square rings around the bulls-eye pattern.



Fig. 5. PDF417 barcode is a stacked, linear symbol.



Fig. 6. QR Code is often used in consumer marketing.

Throughout North America, a driver's license includes a PDF417 barcode that contains much of the information that appears in human-readable form on the ID card. In other regions of the world, it is more common to find Optical Character Recognition (OCR) fonts as the machine-readable technology. Many companies are already leveraging 2D scanners to more quickly and accurately capture information such as name, address, and age. For applications like loyalty program sign-up, this means the elimination of paper forms and associated transcription errors.

Kiosks can make a personal connection simply by adding a modern 2D image reader that can scan 2D barcodes and OCR on customer driver's licenses, passports and other ID cards.

## Mobile Coupons



Fig. 7. Mobile coupons are usually tailored to the customer's preferences.

Coupons have been used for decades to entice shoppers with incentives, but only recently have they been able to pinpoint individual shoppers. Before the technology for mobile coupons was developed, it was common for retailers to print pages of coupons with various offers to serve a wide group of would-be customers. Shoppers who were looking for a bargain would have to search through dozens of paper coupons to find offers that interested them.

Mobile coupons that are delivered to a person's smartphone and tailored to their individual preferences are typically more likely to be seen and acted upon (fig. 7). In many cases, these coupons are used as a link between the digital world and the physical store. To complete the link, many retailers are installing 2D image readers in the store, whether it be in the check-out lanes or in a tablet computer that an employee carries.

Sometimes shoppers are unable to find a store employee, but they can often find a price checker device that is mounted in store aisles to answer basic questions, like price. Retailers would like to reduce their labor costs, but they risk damage to customer loyalty if it becomes too difficult for a customer to get answers to questions quickly and easily.

### Enriching the Customer's Experience



Fig. 8. Digital signage in stores is used to enhance the customer's shopping experience.

Kiosks and digital signage solutions are often being deployed in stores to provide rich information about products (fig. 8). Instead of simply displaying the price of a product, if the kiosk is also showing a promotional video about the product, it is possible that the customer's interest will be roused and they may purchase the product.

By incorporating a 2D image reader, the kiosk could scan a mobile coupon that is displayed on the customer's phone, instantly identifying the customer and the personalized offer. Once the customer is identified, the kiosk could look up the customer's preferred size and colors. It could advise the customer about inventory and store location. In a grocery store, the kiosk could be aware of the customer's dietary needs and, when the product's barcode is scanned by the customer, the kiosk could alert the customer if the item contained an unwanted or even harmful ingredient.

## Secure Transactions



Fig. 9. Security is often a concern when personal information is accessed at a kiosk.

Security is a concern whenever customer information is accessed. The need for security is especially important for healthcare applications where a kiosk may be set up to access personal health data, or where a kiosk is used for a financial transaction (fig. 9). In these cases, a person may self-identify by scanning their ID card at the kiosk, and then the system performs a secondary authentication.

A common practice today is to send a unique code to the person's smartphone. The code is displayed on the smartphone, which is scanned at the kiosk as a second level of authentication. Most people carry their smartphone with them, so while it may be possible for a thief to skim a credit card number, it is less likely that the thief will also have the victim's smartphone and the ability to unlock the phone.

Movie-goers can purchase tickets for a show at home, and have a secure 2D code sent to their smartphone. When they arrive at the theater, they can scan the code at a kiosk and it will print tickets, saving them from having to wait in line for the new blockbuster movie.

If personal information is scanned from an ID card, it is important that the data is encrypted before transmitting over the Internet. Some ID card reading solutions rely on a connection to the Cloud for data interpretation, potentially putting personally-identifiable information at risk. Other solutions exist so that the ID card information can be extracted inside the 2D image reader, offering a more secure transaction and a simpler system design.

## Conclusion

The adoption of smartphones and tablets is strong evidence that people are more comfortable using technology to access information on the Internet. A kiosk offers a similar user interface, but can provide messages that are relevant to a specific person. The brand owner crafts the kiosk messaging to the image it wants to portray, which is typically superior to a generic Internet browser where the person may be more likely to seek information from a different brand's website.

This is five-star service in the digital age, and it all starts when customers securely identify themselves using a 2D code on an ID card, a mobile coupon, or a mobile ticket. Modern 2D image readers are easily integrated into kiosks, and they capture 2D codes more quickly and accurately.

### Solution

One such 2D image reading solution is the Honeywell CM Series Compact 2D Imager Module for Kiosk Data Capture Operations, which provides a self-contained 1D and 2D barcode scanning solution, whether decoding mobile phone screens or paper (fig. 10). Compared to other competitive solutions, the CM Series is easier to integrate into the kiosk because it offers ten mounting holes (five groups of two) that allow for vertical or horizontal mounting, it accepts a standard micro-USB cable connector, and it has a built-in cable retention mechanism that minimizes the risk that the device will become unplugged when the kiosk is moved or serviced. The CM Series Compact 2D Imager Module withstands both extreme hot and cold temperatures and offers a wide-angle optics version in the same housing. It can be purchased with the EasyDL option for extracting information from a driver's license in North America, and offers enhanced security because the extraction is performed completely inside the device – there is no need to transmit personal information over the Internet.



Fig. 10. Honeywell CM Series Compact 2D Imager Module for Kiosk Data Capture Operations

Devices such as the CM Series Compact 2D Imager Module can be used to provide customer service at the kiosk that is almost on par with the most trained customer service employees.

Learn more about how our CM Series Compact 2D Imager Module can help improve your customers' shopping experience. Visit our website at <https://www.honeywellaidc.com/products/oem-scanners/2d-imagers/cm-series>, call us at 1-800-934-3163, or email Honeywell Sales [here](#).

## About the Author



Rob Hussey, Market Development Manager at Honeywell Sensing and Internet of Things, is an expert on barcode symbologies and reading technology, and on the business applications that have become more accurate and more efficient with the adoption of barcode technology.

As an inventor with 98 U.S. patents, he has been a driving force in the development of industry standards that are used in hospital patient safety, material handling, airline boarding passes, electronic and telecommunications part marking, retail operations, mobile coupons and payments. Rob and his esteemed colleague Dr. Andy Longacre pioneered 2D reading with a handheld PDF417 reader that was the first of its kind, and invented Aztec Code using advanced error correction and detection technology. He has been a key contributor to several generations of 2D area imaging readers.

Rob is the 2007 recipient of the AIM Global's Richard R. Dilling Award and a member of the AIDC 100 organization. He earned a BSEE degree from Clarkson University, an ME from the University of Virginia, and an MBA from the University of Pennsylvania's Wharton School of Business. He may be contacted at [robert.hussey@honeywell.com](mailto:robert.hussey@honeywell.com).

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