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A recommendation from GBIC –  
the German Banking Industry Committee

What does a good terminal for  
contactless payment look like?



 **Fraunhofer**  
IAO

## The „human factor“ is the key – technical benefits notwithstanding

Contactless payment is apparently gathering momentum. You just need to take out your card, wave it at the terminal and the transaction is completed - convenient, intuitive, but above all quick and easy. At least that, more or less, is how the process is portrayed in the media. However, in real life it is quite rare to see someone making a contactless payment at a German point of sale. So is it wrong to treat contactless payment as a ground-breaking innovation? Is it just that no one really wants to use this payment method, or what is preventing customers and retailers from using this new technology?

To answer these questions DK/GBIC (Deutsche Kreditwirtschaft / German Banking Industry Committee) conducted an ergonomics study on contactless payments in collaboration with the Human Factors Engineering Team at Fraunhofer IAO. At this point we can pre-empt one of the findings: the stumbling block is certainly not a lack of willingness to use contactless payment methods, since only around 13 percent of test participants were undecided about contactless payments or categorically rejected this method.

But if that is the case, why are contactless payments not used more frequently? What are the real obstacles to their implementation and to what extent might this be due to the contactless terminals currently in use? To find out more, we tested four commercially available mobile and stationary payment terminals with a contactless function of the type already being used worldwide, as well as a prototype designed by Fraunhofer IAO in line with DK/GBIC recommendations.

## Controlled conditions in familiar surroundings

The study's first and most important finding: the human factor is key as regards the advantages and the trouble-free process of contactless transactions. Just holding the card in front of the terminal is still an unfamiliar action for many users, as they have learned to insert the card and have used that method for many years, so that it has become deeply ingrained in everyday behaviour. Three quarters of the test participants inserted the card in the more or less prominently located card slot without giving it any further thought. Under normal circumstances these transactions could therefore have been successfully concluded using the contact-based method. However, the slot had been deactivated on all of the terminals and it was pointed out to the test participants that they should look for a different payment method. Within the test configuration this was the only intervention in normal consumer behaviour.

From this we derived a second key aspect, i.e. the need for the ergonomic optimisation of contactless payment terminals. In many cases it is not immediately obvious where the contact point for contactless payments is located, while the slot for contact-based payments is usually clearly indicated or visible. The variable location of the contactless reader, which, depending on the model and add-on functionality, is either at the side or in the display of current generations of terminals, also increases the amount of time spent searching for the contactless interface, thereby hindering the transaction process.

The assumption that the general learning process would be enhanced if contactless payments were to be made initially by using a smartphone turned out to be wrong. Of course, none of the test participants tried to insert the mobile phone in the card slot. Searching for the contacting unit took just as long as when the card was used. In the end a contactless payment was made. However, 60 percent of test participants again used the card slot for the „second purchase using a card“ immediately afterwards. In other words, the test participants did not manage to draw the obvious conclusion that, having used their mobile for a contactless payment, they could also use their card in the same way. We were unable to confirm the „smartphone as contactless driver“, at least not in this form. 31 percent of test participants would consider using their smartphone as a medium for contactless payments in future. In their very personal preliminary choice, 58 percent of test participants opted for the card as their preferred medium for contactless payments. In this context we were also unable to discern any difference in terms of age or gender.

## What does a good terminal for contactless payments look like?

Fraunhofer IAO pointed out that the range of terminals currently available is very obviously designed with contact-based insertion in mind or clearly optimised for this function. If contactless payment is to be prioritised by operators (trade, industry, card issuers), the slot would have to be in a less prominent and less inviting position on the terminal. Otherwise cardholders will, time and time again, opt for the method that has become a habit over many years, i.e. inserting the card in the terminal.

If customers are to make contactless payments in future, the sequence of movements involved must be easier and simpler than the current method.

From the user's perspective two key requirements relating to the terminal have clearly emerged from this study: „visibility“ and „transparency“, i.e. where and how I have to hold or place the card / smart-phone to make a contactless payment.

## The following, clearly necessary improvements were proposed as a result of the study:

The theoretically optimum terminal should have the following features:

1. It should feature LEDs that highlight the operating component (e.g. the contacting unit) and light up whenever a user interaction is required, for instance tapping the card against the unit.
2. It should possess a well-defined and clearly visible „landing zone“ where the card needs to be placed or tapped - also referred to as an offset reader.
3. Using the display itself as the contacting unit / reader for the contactless card is considered illogical because the cardholder, when making a contactless payment or rather waving the card at the reader actually covers that particular unit, which means that the cardholder is then unable to read any further messages or instructions.
4. The display should be larger than the current standard and furthermore it should contain fewer combinations of writing and pictograms. It should use a clear picture language and possess a process display for visualisation of the transaction progress.
5. The slot for the card should be comparatively less accessible / less prominent.

**The complete management summary of the ergonomics study of the GBIC is available in German at:**

<http://www.girocard.eu/presse/hintergrund/studien.html>



# Addendum

## Terminals tested



Terminal A

Terminal B

Terminal C

Terminal D

Terminal E

Stationary

Mobile

Stationary

Stationary &amp; mobile

Stationary

Reader:  
in the displayReader  
in the displayReader:  
At the side  
(left or right)Reader:  
Offset,  
incl. card-rest facilityReader:  
Offset  
Large display

## Test set-up

Five different terminals were tested. Four of these terminals are already in use worldwide. One terminal (terminal D) was a new design as specified by DK/GBIC and built in the workshops of the Fraunhofer-Institute. This terminal was explicitly designed to make contactless transactions easier for the test participants, particularly on account of its special construction. Terminals intended for both mobile and stationary use were tested. They also differed in their reader positions (see above).

There were only minor differences in the screen displays. To ensure comparability, all devices had the same control software and the same text displays and pictograms. No real transactions were carried out on these devices. For test purposes the payment scenarios were initiated remotely from the test supervisor's PC.



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