

Apple - Pay, Towards the Acceptance of German Customers

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Abstract

This article is based on a study that aims to analyze factors influencing the acceptance of contactless payment devices by customers in Germany. Its purpose is to explain the influence of similar technologies, already in use towards the acceptance of contactless payment technology. Smartphones, especially the I-phone as one device of mobile technology, is offering a mobile payment procedure named Apple Pay. Contactless payment technologies are developing away from physically present credit card shaped plastic cards by an integration into mobile phone devices. Interviews in personal contact on petrol stations in Hamburg, Germany, have been conducted. Petrol stations are typically points of sale with a high rate of non-cash payments and customers have time to answer questions for an interview during refueling. 48 hours of interviews have been collected on two petrol stations in one of Germany's largest cities, interviewing typical business-customers on a Monday and private customers on the weekend. The technology acceptance model has been chosen to identify and explain the interaction in the customer's perception of new payment devices. The study reveals that the influence of information on the new payment process and possession of a customer loyalty card are critical variables in the customer acceptance of payment devices. Information about the new payment method proves to be the argument with strongest impact on the acceptance by customers. Besides these variables, perceived usefulness of the technology has been found as a significant factor in affecting the acceptance of contactless payment processes. Apples I-Phone with its current market penetration has the potential to provide a widespread and well known concept as basis for contactless payment technology.

Keywords: I-Phone, contactless payment, apple pay, smartphone, technology acceptance, mobile payment, customer loyalty

1. Introduction

Contactless payment is believed to be the new non-cash payment process for the upcoming decade (Turban et al., 2015; Koether, 2014; Schmiedel et al., 2012). The motivation for retailers is simple when the costs of a payment process are taken into consideration. Retailers have the motivation to reduce their ratio of cash versus non-cash payments, as handling of coins and banknotes is the most expensive payment instrument (Xiao et al., 2015; Gupta, 2013; Salmony, 2011). These costs include expenses for transfer costs, four eye principle in handling and counting, security measures during and after office hours. Transport costs and the order process bring cash in an unfavorable position (Salmony, 2011; Schmiedel et al., 2012). Debit cards had with 21.4 billion Euro in 2001 a high share in payment but more than quadrupled within the last ten years in Germany (Bankenverband, 2012). Nevertheless the pace of growth is decreasing since 2010. New impulses are required to move on from traditional cash (Bankenverband, 2012). Card based payment processes have a reputation of being complicated in handling for customers. New concepts are required to step into an era that is in correspondence with new streams like industry 4.0, big data and the effect on customers in an internet connected society (Wang et al., 2014). Another aspect is that cash is an uncontrolled payment system that moves high values quick, unremarkable and untraceable from demand to supplier side. It is therefore the preferred payment instrument of criminals and tax evaders (Wright et al., 2014). Cash payments are, from an economic position, the root of tax evading and need to be limited. One solution is a ceiling amount for cash payments in an economy to force money transfer into traceable paths like card payments (Ardizzi et al., 2014). Governmental institutions are looking for plans to get these electronic payment processes, even on small amounts, to readiness and attractiveness for the retail market (Christian, 2014).

Besides the economic perspective the opinion of customers is of importance for the business case in non-cash payments. An important aspect of cash versus card payment is the secured payment process of card payments.

Cash-money can simply be stolen whereas electronic money is always traceable. Customers focus on simple and reliable payments systems, such as cash is up to a certain extent. Cash was unchallenged the number one payment device up to the moment when virtual shopping started to become a major player in retail business. The internet required nevertheless a new payment process that is secure and simple for customer's at the same time. Platforms attract private customers on a c2c level were even more difficult to serve when the selling part was a private person and not a credit card retail partner - card payments were therefore not possible. Pay-Pal was one early and strong emerging player in the online market, backed by another global actor, e-bay (Trautman, 2014; Fleisch et al., 2015). Pay-Pal's business case focused on the c2c business and aimed higher for the b2c market. The market share was easily expanded at the expense of credit cards, as Pay-Pal guaranteed insurance and coverage for cases of online fraud. That step made the new payment system quick and the number one in online payment systems. The question that consequently evoked was: How can Pay-Pal transform its online success, so that retail stores and the mass market can be reached beyond the internet?

Contactless payment cards have been rolled out in Germany since 2008 by all major credit card providers. The payment industry was at that point in need for a new product that is able to transform the new security based online processes in an offline environment. Right here started the credit card industry a new product on contactless payment technology. MasterCard's Pay-Pass technology tried to modernize the card payment industry by contactless payment processes on a card based item. In contrast to online payment providers, credit card companies had the advantage of a high number of customers already. They were not forced to search for customers, they could simply approach them.

Most retailers see the main issue for a successful diffusion of the technology in the lacking acceptance of contactless payment technology by their customers (Weinfurter et al., 2013). 43% of retailers would accept the new payment method (Weinfurter et al., 2013) as they understand the benefits from a retailer perspective, in context with high cash handling costs. It was only a question of time until other players than credit card institutes would identify the payment process, even with very small margins per transaction but high turnarounds, as new business opportunity.

Apple, one global player with a holistic approach, known for simple processes and easy utilization for customers, enters the new market segment on low price and low margin payments in 2015 (Almeida et al., 2015). The news struck the payment industry hard. This global player has the power to change the business fundamentally as his market diffusion is already high - similar to credit card diffusion and the concept of applications on smartphone devices, offers nearly unlimited possibilities to develop new services based on the technical device. Payments on small and midsized amounts until the limit of 20 Euro are in numbers a big business. Margins have to be small to get retailers on board, payments have to be fast and uncomplicated to keep the number of cashier acts as high as possible and customers have to accept the new payment technology. Apple realized small margins on low valued services or products already with its i-tunes music store. In 2011 were 160 million users worldwide customers of Apples i-tunes service and bought for small amounts music song by song (Ondrus & Lyytinen, 2011). In 2012 already half of the US population were using smartphones which made the market so attractive for the global players (Smith, 2012).

German customers are traditionally skeptical against non-cash payments and the involvement of an electronic device like their smartphone bears the risk of rejection on top. Diffusion bases on acceptance by customers and this acceptance needs an understanding of mechanism behind the acceptance of a new payment technology by customers. This study tries to explain certain mechanisms in the acceptance of the technology and variables influencing a positive approach by customers. It tries to reveal the influence of information of the new payment instrument, credit card payment for online shopping and the possession of a loyalty card on the acceptance of contactless payment technology.

2. Method

In Germany, credit card terminals are a well-known device as it combines credit and debit card payments in one terminal and the utilization is getting more and more common in Germany's retail stores. As a classical chicken-egg dilemma appeared concerning the question whether the terminal or the payment device on customer's side was first available in the diffusion of new payment technology, credit card companies started to equip standard credit cards with contactless payment feature. This extra feature is not discoverable from the outside; just one logo on the backside of the payment device gives evidence of the contactless feature inside. From an industry point of view, it was planned to rope customers into the utilization once they understand the concept of fast and easy contactless payments as they are already in possession of the contactless feature.

Moreover is it interesting to understand for more sophisticated payment devices, like Apple-Pay or other device

based payment concepts, how the customer evaluates the technology and which factors are the drivers for the acceptance. This study focuses on three hypotheses in order to clarify customer's behavioral intention to use contactless payment devices by analyzing their perceived usefulness (PU) and perceived ease of use (PEOU), according to the Technology Acceptance Model of Venkatesh and Davis.

This study is designed on the concept of technology acceptance from Venkatesh and Davis (1996). The Technology acceptance model (TAM) is consistent on external variables which influence the two endogenous elements, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These two elements affect the Behavioural Intention (BI). TAM describes the influence of variables on the voluntary use of a technology. The concept of a TAM is influenced by the 'Theory of reasoned Action' (Fishbein and Ajzen, 1975) and the 'Theory of planned Behavior' (Ajzen, 1991). Each of the endogenous elements, PU, PEOU and BI, is described by its own set of questions in the TAM. The questions on PU have been selected according to the studies of Venkatesh and Davis (1996), (2000) and Venkatesh and Morris (2000). PEOU examined by questions selected according to Chen (2008), Chen and Chen (2009) and Kim and Garrison (2009).

Venkatesh and Davis describe in their work the influence of PU and PEOU on the acceptance of a technology. The similarities are obvious when understanding the payment device, especially as mobile phone or smartphone, as the technology to be questioned. The following hypotheses can be drawn in accordance to the general question for a successful diffusion and introduction of mobile payment services in retail business. The following simplified version of the Technology Acceptance Model was published by Venkatesh and Davis in 1996. Interesting is in that context the integration of external variables as used in this research design to reveal the influence of external elements on the acceptance of mobile payments.

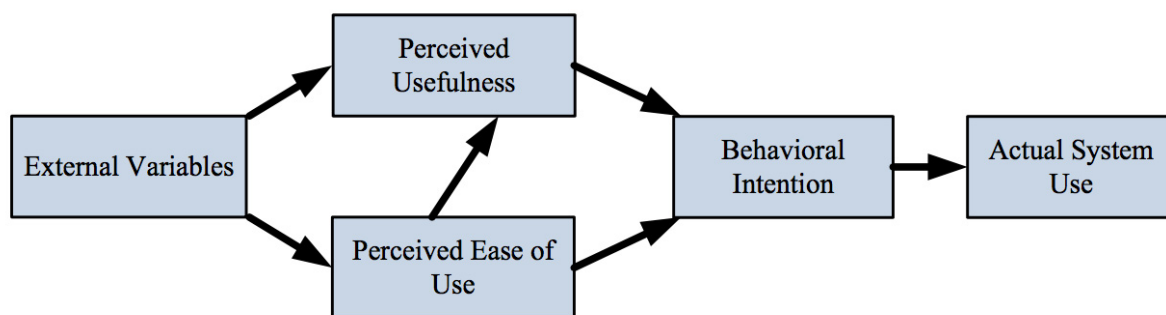


Figure 1.

Hypothesis 1: The level of information of customers about contactless payments influences the acceptance positively.

The knowledge about RFID technology is influencing the acceptance of RFID backed processes. This was proven by an empirical study in Korea, assuming that employee's knowledge about RFID technology influences the acceptance of RFID (Lee, 2009). Furthermore it is interesting to understand if the level of information will positively affect the concepts of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which again influence the Behavioural Intention (BI).

Given the use of modern smartphones in the payment process as intended by Apple Computers, the level of information about this technology is essential. Will the user understand the simplicity and the level of usefulness for a customer? The level of information might be crucial to understand the benefits and therefore be crucial for the utilization, too.

Hypothesis 2: Paying by credit card when shopping online has a positive influence on the acceptance of contactless payment technology.

As a study on electronic ID cards shows (Grote et al., 2010), value and skepticism influence the acceptance of a new contactless technology. For online shopping customers, the benefit in the payment process is possibly overriding the level of risks according to Grote's study. Credit cards are used in online shopping processes where trust and security issues have been overcome. This variable has the potential to show if customers reduce their security needs towards a payment process, affected by the simplicity and reduced complexity. Payment on delivery might be an option in online shopping, but payment by credit card is meanwhile common and popular that some larger online shopping portals waive the payment on delivery option at all. Their market power is so

strong, that users are nearly not resisting participating and using their credit cards as the only instrument of payment. Regarding contactless payments, the added value can be described as a combination of increased speed and simplicity. Contactless payment might have a similar need of security as the utilization of online shopping procedures. Security of data and safety against fraud are in both cases in the focus of customers. Therefore some parallels can be drawn and customers using credit cards online are of interest for the line of argumentation towards contactless payment devices and technologies. Their need for security and trust may influence the perception of contactless payment devices and their acceptance.

Hypothesis 3: Loyalty card possession has a positive influence on the acceptance of contactless payment technology.

Loyalty cards express the affiliation to a brand or branch. Customers holding such loyalty cards also give willingly their data on personal and shopping related elements to the loyalty card issuer. A customer figures out the risks and benefits of this behavior before applying for a loyalty membership. According to Holvast (2009), this means that they are looking for a way of remuneration for loyalty. In contrast to an ID card holder, customers apply for loyalty membership on a voluntary basis seeking for various incentives.

The decision to use contactless payment processes might be of interest, as several add-on benefits can be connected to payment processes. The involvement of a smart phone even increases this additional offer, as services and benefits can be nearly endlessly expanded. Speaking in terms of the Technology Acceptance Model, rejection on behalf of the Perceived Usefulness (PU) is to be seen in context to a rather negative assessment of the benefits available. Rejection on behalf of the Perceived Ease of Use (PEOU) is on the other hand related to a too complex process with high personal involvement that results in a negative benefit-participation ratio.

Mobile phones as chosen device of contactless payment are the combination of several factors. Loyalty membership might be an integrated part of a payment process. Furthermore is the marketing effect of these payments not to be underestimated. The combination of payment and affiliation programs offers a direct marketing channel towards a computer device of customers. Via this channel is the direct communication nearly endlessly. Thinking of direct marketing campaigns, broadcasting of special offers and the binding process of customers, open up a new dimension in marketing. Customers can be targeted, segmented and exploited on data basis. Payment providers reach now a new data basis that has lately been provided to credit card companies only. Thinking of the app-store of smartphones, this offers new sales horizons.

A study on the utilization of credit cards reveals that petrol stations are the main location for credit card payments in Germany. 57.4% of all purchases paid by credit card were done here, followed by 55.3% in retail shops (2008). Petrol stations combine a large diffusion with a high mixture of different social and demographic groups of citizens. Therefore are petrol stations the main point of interest for a study on mobile payment devices.

Each station selected had to fulfill the following criteria:

- 24/7 service to customers, to reach the different customer segments, petrol and grocery related.
- Additional services for customers, such as car washing facility and a large shop segment to attract customers of a large variety, not only petrol and car related. Car washing facilities offer the chance to come in contact with the drivers during a possible waiting time or cue.
- The petrol stations in question shall be from one chain, to guarantee a similar environment as well as similar procedures on the point of sale. A large chain shall be avoided as this bears the risk of involvement and bias out of the perspective and marketing aspects of the chain. One small chain in the northern part of Germany has been selected after a long starting phase. This chain offered contactless payment by credit card as one of the first branches in Hamburg.
- Hamburg is the city in Germany with the longest history of the petrol chain and solid market diffusion. Therefore Hamburg was selected as city for the survey.
- Two petrol stations, out of 12 stations within the selected chain have been selected. One station is on an arterial road, linking the outskirts with the city center, and the second one close to Hamburg's airport where workers buy around the clock petrol and grocery products in the station.
- The study for payment systems has been planned on a weekend as it offers the chance to get answers from various customers groups, as Saturdays are frequented by private customers,

in the evening with younger age groups, Sundays are used by family members in the morning, buying newspapers and bakery products and Mondays are frequented by business customers filling up the cars. Therefore guarantee these three days a high mixture of various age and business groups, from grocery to classical petrol customers.

The chosen data collection form is the interview, where three interviewers approached the interviewee in the fueling or cueing for check-out phase on the point of sale. Refueling offered a timeframe around four to five minutes where the customer was highly willing to bridge this timeframe with an interview. Queuing for the cash desk offers a similar chance, although the interview had to be continued as the average queue lasted for two to three minutes.

3. Results

A sample of $n=1,294$ valid answers was achieved in three days. 496 female customers and 798 male customers were interviewed in the age group from 18 to 72 years.

Data from the questionnaires reached acceptable Cronbach's alphas on internal consistency. Each of the endogenous elements, PU (.811), PEOU (.846) and BI (.721) reaches appropriate levels, as according to Nunnally (1978) and Cohen (2003). The χ^2/df ratio is expected to be at a maximum of 3.0 (Homburg & Giering, 1996) or even 2.0 (Byrne, 1989) and with 5.378 this limit is out of range. χ^2 values increase disproportionately with an increasing sample sizes. The weakness of the χ^2 concept is that at a sufficiently large n , nearly every model is rejected according to literature (Jöreskog & Sörbom, 1982; Bagozzi, 1981). χ^2 depends directly on the sample size (Anderson & Gerbing, 1988) which is disadvantageous. Therefore, although the χ^2/df value of 5.378 for the default model rejects the model fitness, with $n=1,294$, this is not conclusive for a final rejection. Rejection might be based on a type II error. Root Mean Square Error of Approximation (RMSEA) with .058 (90% CI = [.054;.063]) delivers on the other hand reasons for the acceptance of the model. A RMSEA of $\leq .08$ indicates a sufficient model fitness according to Brown and Cudeck as well as Steiger (Browne & Cudeck, 1993; Steiger, 1990). Hu and Bentler (1999) suggest an even lower threshold of $\leq .06$, that this model is still able to comply with. The RMSEA value for the model indicates its acceptance and this is even conclusive as larger sample sizes are eliminated in this concept. Values for the Normed Fit Index (NFI) of .904, Incremental Fit Index (IFI) of .920 and Comparative Fit Index (CFI) of .920 indicate an adequate model fit with values above the critical value of .9 (Schumacker & Lomax, 1996; Marsh & Grayson, 1995). Regression values and standardized regression values have been calculated in order to highlight the influence of variables on the elements of PU and PEOU and their influences on BI.

Hypothesis 1: As the results show, PEOU (.229) and PU (.191) are strongly influenced by the variable level of information. High regression weights indicate this with accordingly high significance (***). Therefore Hypothesis 1 is fully supported by the results of the study. The influence on PEOU is even stronger and supports the argument that customers understand the benefits of a contactless technology with their increasing knowledge. PU is finally influenced on the direct path, but even more influencing is the indirect path via PEOU. Highest values are available on the most complex path, via $V \rightarrow PEOU \rightarrow PU \rightarrow BI$. This points to a complex line of argumentation: A high level of knowledge about contactless payment processes and the technology behind it is essential in order to attract customers and reach a high level of acceptance among them. Simplicity is thereby the key element for final acceptance and has a strong impact on the understanding of the usefulness of a new payment process. It is mandatory to develop various paths of communication towards the customer the discovery of other variables influencing the acceptance seems to be a necessity.

Hypothesis 2: Shopping online and paying by credit card does not show any significant influence on PU (P-value=.298) or PEOU (P-value=.570). It can be stated that online payment with credit cards does not influence the acceptance of contactless payment processes. Online shoppers generally understand the usefulness of the new technology, as the variable of shopping online delivers significant values but only on PU (***). The significance of the regression weight is on PEOU with $p=.065$ and therefore outside the accepted range of $<.050$. It can be stated that the users could not fully understand the simplicity of the technology but on the other hand understand its usefulness. Furthermore have online shoppers no trust and security concerns towards the new technology. One immanent measure should be the explanation of the process of the new payment technology, to communicate the speed and easiness in handling contactless payment devices.

Hypothesis 3: Participation in a loyalty program offers the opposite situation according to the regression weights than the variable of online shopping does. The direct path to PU is insignificant (P-value=.377) and only the path via PEOU gives a significant (***) and exploitable regression weight (.099). PU has on the other side a conclusive involvement via its indirect path PEOU on PU. This path is significant and delivers an indirect

regression weight of .067. It can therefore be stated that the possession of a loyalty membership has an influence on the PEOU of contactless payment devices. One possible explanation might be the fact that customers draw analogies between the usability of membership cards and the contactless payment process. Furthermore this may be an explanation for the low values of usefulness in this context. Loyalty membership is based on the understanding of benefits for loyalty. Collected points can be redeemed for services or products, but at first sight, incentives for contactless payments are not identifiable. The usefulness of the technology can logically only be a derivative of the perceived ease of use. This study therefore strongly recommends the combination of loyalty membership and payment devices. Retailers are furthermore advised to make the best out of the argument of speed in the new payment process. Contactless paying customers should be integrated into the group of loyalty membership customers according to on-site benefits. This might lead to a pull strategy for both of the variables. Loyalty members might show interest in contactless payment devices as they simply observe the speed in the payment process by contactless paying customers. On the other hand have customers paying contactless the privilege of being in a separate and more exclusive check-out area. That offers them shorter queues and reduced waiting time. These customers might not necessarily apply for a loyalty membership as they receive the benefits of speed and exclusivity anyway, but a positive result for the retailer remains: Contactless paying customers will prefer this shop due to a privileged service. This strategy attracts other customers and shapes a unique selling proposition in the market.

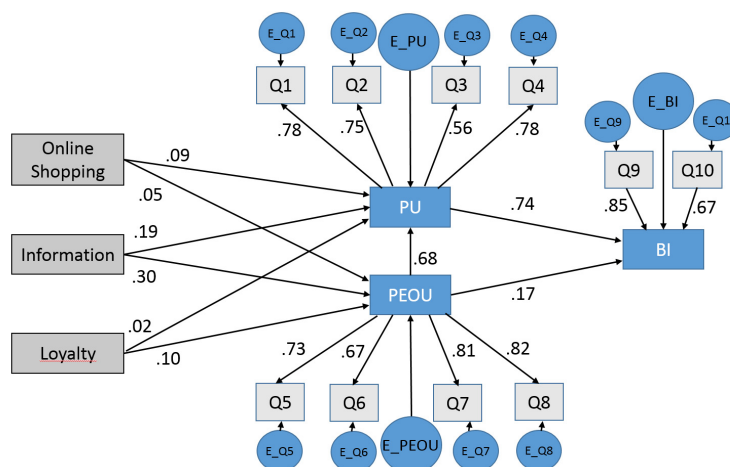


Figure 2.

According to the results of the study on the designated variables, it can be stated that the variable of information has the strongest impact on the acceptance of contactless payment devices. One important conclusion of this study is that communication towards clients should be increased and clearly benefits as well as the process need to be clarified.

One important message from customers is the strength of the influence of PEOU on PU. Regression weights of .680 with high significance (***) illustrate that the ease of use is a key influence leading to the acceptance of the new payment process or payment device. The easier the technology is to handle, the higher is the understanding of personal benefits resulting.

4. Discussion

Information of customers on the mode of operation of contactless payment instruments is the key to a successful diffusion. Contactless payment technology, and that includes mobile phone based payment processes with contactless interface such as Apple Pay, need the customer to catch the simplicity and build an understanding of the process. Knowledge about contactless payment technology is the booster for its acceptance and has to be addressed, as this variable delivers promising findings for a fast diffusion with sustainable results. This points clearly to one major target for marketing within an upcoming diffusion campaign. Proactive communication of the benefits and the background of the payment process accompanied by clear information of the stored data and the process to whom this data is being provided is essential for the success in the diffusion process. Such information is even more of importance as Apple-Pay is based on a mobile phone device and therefore having more capacity of data storage and moreover data processing equipment. Simple contactless credit cards appear to

customers as “dumb” items offering no additional service. They are not estimated as an immanent security issue, as its passiveness associates it with inactivity. Smart phones are more in need of clear communication of processed data, stored information and broadcasted elements. The perceived security, an element that needs to be researched in more detail, should be addressed. This is also one clear result of this study. The combination of payment and electronic devices needs more and detailed information that might have an influence on the perceived security by customers. Thinking about the context in which Apple-Pay has to be rated, this payment process is designed for a single type of device and even only one manufacturer. This device is surely rated as relatively secure, due to a governed application store, as Apple secured by a closed design of its software policy. One is regularly forced to install software that has been formerly approved by Apple and sold via its online store. Open systems, like Android phones will have a larger issue with the security of applications and therefore the trust of customers in the software. This additional entry threshold needs to be addressed and taken in consideration. In total it is obvious why Apple was able to enter the payment market with a proprietary system, they had the knowledge, diffusion of devices and trust by its users. The brand “Apple” has a certain weight and is promising to all contract partners in the payment industry, as each partner expects an early return on investment by a project where such global player is involved.

One major result of this study is the importance of the influence of perceived ease of use on the acceptance of contactless payment procedures. Every variable is equipollent or even stronger influencing the behavioural intention via the element of perceived ease of use (PEOU). Further it is having an impact on the perceived usefulness (PU). The simplicity in handling and the uncomplicated process determines the acceptance on a leading level. Thus, information is the key determinant to a successful diffusion and needs to be addressed in marketing messages towards the customer. As a conclusion of this study, trust and safety seem to be appropriate for further research. Any payment system, currency or card, is based on trust in all participating parties, ensuring the value of the system itself. In opposition to cash payments, the technology based payment process needs in addition the trust in data security and investment security. Contactless payment technology offers a unique chance to set primary standards towards protection of private data, in accordance with several powerful stake holders, such as retail, banks and network providers. Finally it needs to be stated that information and communication are the keys to a successful diffusion of the technology.

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