Mobile payment analysed from the aspects of Kano model

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Abstract
By applying the Kano Model on mobile payment, the paper aims at giving an overview on the basic, performance and excitement requirements that affect customer satisfaction. In this paper, mobile payment customer requirements are compared to former research conducted on payment methods in general. Furthermore, each requirement is divided into two parts focusing on Business-to-Customer and Business-to-Business aspects. The findings of the paper were that while there is still some overlapping between general payment method and mobile payment method requirements, some requirements such as security, fake-proof nature, reputation and reliability of the method has transformed and became more important. Furthermore, due to technological advancements new customer requirements occur.

Keywords: Kano Model, Customer Satisfaction, Mobile Payment, Customer Requirements, Product Attributes

1 Introduction
Customer satisfaction has a great impact on the profitability of a company as a high level of satisfaction that enhances customer loyalty (Hallowell, 1996). Thus, companies aim at satisfy their customer. Different attributes of a product or service may lead to a different level of satisfaction - sometimes even to dissatisfaction (Tontini, 2007). There are certain products and services that need to meet customer requirements from more than one target group such as mobile payment. Providers must satisfy both Business-to-Customer and Business-to-Business targets, that in some cases have different customer requirements (Bridges, Goldsmith & Hofacker, 2005). Furthermore, product development in the context of World Wide Web can be considered challenging as product and technology requirements can rapidly change (Iansiti & MacCormack, 1997).

Mobile payment customer requirements have a foundation upon general payment method requirements (Contius, Martignoni, 2003). However, they have transformed as modern
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technology is continuously improving thus influencing the functionality of payment methods as well as customer expectations. Nonetheless, it has to be stated that due to the complexity of the new technology and portable devices, it has to fulfil a wider range of requirements. According to Contius and Martignoni (2003), change in customer habits is generally a slow process and can require significant marketing investments to be triggered, furthermore, in case of mobile payment the identification of excitement requirements can be challenging and needs to be investigated.

The purpose of the paper is to gain a profound understanding on how customer requirements transformed in mobile payment in comparison to payment methods in general by applying the Kano model of customer satisfaction to the industry. Due to the continuously improving technological basis, the mobile payment industry shows a dynamic growth and stresses the importance of further research in this field.

2 Theory

2.1 Kano Model of customer satisfaction

The Kano Model, created by Noriaki Kano in 1984, identifies the correlation between customer satisfaction and the performance of the product or service of a company (Tontini, 2007). Tontini, Solberg Søilen and Silveira (2013) state that satisfaction is related to what extend customers’ direct and indirect needs are answered by the totality of attributes of a product or a service. Companies that are able to accomplish high customer satisfaction also generate superior economic returns (Anderson, Fornell & Lehmann, 1994, Hallowell, 1996). Therefore, it is crucial to identify which attributes a product has to have in order to meet customer needs, thus generate customer satisfaction.

The Kano model provides a good understanding of customer satisfaction as it analyses customer requirements using a multiple-factor-structure (Pinner, 2014). The model distinguishes between three categories namely basic requirements, performance requirements and excitement requirements.

Basic requirements are considered as essential by the customer as they fulfil fundamental functions of a product or a service. Customers will not appreciate the existence of factors that meet this requirement, however, if basic requirements are not fulfilled customers are expected to be intensely dissatisfied (Tontini, 2007). In case of a smartphone, the functionality to call can be considered as a basic requirement. Even though, this is an obligatory function of the device and customers demand it, buyers are also considering various other factors when purchasing a device.

Performance requirements describe factors where the satisfaction is in a proportional relationship to the performance level. Which means if one of these two variables (satisfaction/performance) increase or decrease, so does the other one. Most cases customers openly demand these attributes (Tontini, 2007). Tontini (2007) states that excitement requirements are crucial and have a significant effect on customer satisfaction. With the presence of these requirements, the product or service will satisfy the customer in a superior way. However, the absence of meeting these requirements or their insufficient performance will not bring dissatisfaction to the customer, as they are not required by the customer (Tontini, 2007).

The Kano Model has been applied by various scholars, however, the literature has no consistency regarding terminology of the names of each aspect. As an example, Kano (1984)
uses the terms of must-be, one-dimensional and attractive quality. Matzler and Hinterhuber (1998) and Tontini (2007) refer to the three aspects as requirements. Zhao and Roy (2009) as attributes (See: Fig. 1). The authors of this paper decided on using “requirements” for the three main aspects in order to be consistent and enhance the reader’s understanding.

![Fig. 1](image_url)

**Fig. 1.** The different types of impacts of attribute-level performance on satisfaction (Zhao & Roy Dholakia, 2009, p. 289)

Beside the three previously described factors, two further attributes can be mentioned: neutral and reverse. Neutral attributes are indifferent regarding satisfaction: neither their presence nor their absence brings satisfaction or dissatisfaction. In contrast, the “reverse” attributes generate more satisfaction when absent than present (Tontini, Solberg Søilen & Silveira, 2013).

Customer preferences show a continuous change that have an effect on how they perceive the attractiveness of a product or a service. As users get used to technological advancements performance requirements can turn into basic requirements, thus pushing technological developments to introduce new potentially performance requirements (Tripsas, 2008).

### 2.2 Mobile Payment

Mobile payment is defined as “any payment where a mobile device is used to initiate, authorize and confirm an exchange of financial value in return for goods and services.” (Au & Kauffman, 2008, p. 141). Such mobile devices can be mobile phones, smartphones and tablet-PC (Lerner, 2012). Mallat (2007) defines mobile payment as “[m]obile payments are defined as the use of a mobile device to conduct a payment transaction in which money or funds are transferred from payer to receiver via an intermediary, or directly, without an intermediary” (p. 415). Turowski and Pousttchi (2013) define mobile payment as an electronic payment procedure where at least the payer has to use mobile communication technology for initiation, authorization or realization of the payment. Furthermore, the usage of mobile payment is possible but not limited to mobile commerce (m-commerce) and electronic commerce (e-commerce) but also usable offline at the cash desk.

Thereby, the central element in mobile payment is the authorisation of the payment process by the ultimate customer using a mobile phone (Henkel, 2002). Competitive advantage might be achieved by companies if they manage to offer mobile payment solutions for their customers (Mallat, 2007). Due to the technological development of mobile phones and the need of increased efficiency in one’s everyday life, the acceptance of mobile payment increases
(Andersson, 2016). It can be concluded that in comparison to traditional payment instruments (such as cash), mobile payment adds the advantage of independency of time and place for the payment process (Mallat, 2007). Nonetheless, mobile payment is still not a standardized method and trust in smartphone technology plays still a crucial issue for customers to adapt this new payment method (Andersson, 2016).

The authors differentiate between three kinds of mobile payment. Firstly, mobile payment can be done in online shops where a third party payment method is integrated. When using such methods no additional application is needed, customers follow same steps as when paying online by using a laptop/PC. Secondly, a customer can download a mobile application of an online store to ease the shopping experience. In this case, mobile payment is integrated to the application. Steps taken by customers are same, however, it is more user-friendly, visually optimized. Thirdly, mobile payment can be done by downloading an extra software of a payment provider (application) to one’s mobile device to enable the user to pay for products or services via websites or on spot (e.g. by scanning in QR code or using telephone number).

The authors of this paper distinguish between mobile payment providers and online banking. The latter includes also organisational applications where you can organise/administer your money and transfer money as well.

Furthermore, it has to be stressed that there is a difference in requirements in mobile payment for Business-to-Business (B2B) and Business-to-Consumers (B2C). Even though, the requirements from the ultimate users (B2C) in relation to mobile payment methods are in line with B2B customers’ requirements, mobile payment providers have to meet additional requirements from the business partners.

### 2.3 General Payment Method

Contius and Martignoni (2003) categorise requirements of payment methods in general into the three different attributes of the Kano model. Basic requirements are totality, consistence, durability, reputation and reliability of the method, fake-proof nature, convertibility, ability for circulation. The authors refer widespreadness, low costs, comprehensibility, anonymity, internationality and portability as performance requirements. The third category, excitement requirements include additional / add-on benefits (See: Fig. 2).

<table>
<thead>
<tr>
<th>Basic requirements</th>
<th>Performance requirements</th>
<th>Excitement requirements</th>
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<tbody>
<tr>
<td>Totality</td>
<td>Widespreadness</td>
<td>Attractive attributes</td>
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<tr>
<td>Consistence</td>
<td>Low costs</td>
<td></td>
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<tr>
<td>Durability</td>
<td>Comprehensibility</td>
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<tr>
<td>Reputation and reliability of the method</td>
<td>Anonymity</td>
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<tr>
<td>Fake-proof nature</td>
<td>Internationality</td>
<td></td>
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<tr>
<td>Convertibility</td>
<td>Portability</td>
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<tr>
<td>Ability for circulation</td>
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<tr>
<td>Security</td>
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</tbody>
</table>

**Fig. 2. Requirements of payment methods (Contius and Martignoni, 2003, p. 66).**
3 Method

Analysis was conducted by applying the Kano Model of customer satisfaction on mobile payment. Secondary data was gathered from both scientific articles and well as online articles due to the fact that mobile payment is a current issue, showing a dynamic development.

Limitations of the paper include that there has been no differentiation whether mobile payment was conducted by using a smart phone or a tablet. Furthermore, the analysis of the paper is focusing on the B2C and B2B aspects, but neglects to investigate each in depth in relation to the kinds of mobile payment (e-commerce, m-commerce, application). Some parts of the paper are subjective to the authors' opinion as there is lack of literature for certain aspects.

4 Analysis

In the following, based on the dimensions of Contius and Martignoni (2003) - basic, performance and excitement requirements - mobile payment will be analysed to what extend it meets the requirements set to payment methods in general and how the two differs. Furthermore, it has to be stressed that there is a difference in requirements in mobile payment for Business-to-Consumers (B2C) and Business-to-Business (B2B). According to Anderson, Fornell & Lehmann (1994), the higher customer satisfaction a company can accomplish the higher economic returns it can expect. Therefore, it can be concluded that it is in the company’s interest to meet the basic requirements of its customers, the mobile payment method provider’s B2C customers. Therefore, in the parts of the analysis that focuses on B2B, only those requirements will be mentioned that are unique for B2B. In the last part of the analysis, possible neutral and reverse attributes for mobile payment are identified. This section is only focusing on B2C and B2B mobile payment attributes and does not include comparison to general payment methods.

It has to be stated, that customers, who use mobile payment, do not pay with the money itself but use a medium in the form of mobile device to transfer money. Although, the mentioned is not part of the core product but an external factor, yet is still highly affects the product requirements from the customer, such as security and anonymity. As mobile payment only functions via internet, a stable internet connection has also become of core importance. Therefore, it can be seen as a prerequisite for mobile payment method in comparison to general payment method. Operating system can also be seen as pre requirement when paying with via mobile application as the payment process is not possible if the application cannot be downloaded.

4.1 Basic Requirements

B2C

According to Contius and Martignoni (2003), security, reputation and reliability of the method, fake-proof nature, convertibility, durability, ability for circulation are classified as basic requirements for payment methods in general. Out of the mentioned, ability for circulation, convertibility, consistency, durability and totality can also be considered as basic requirements for mobile payment. Security, fake-proof nature, reputation and reliability of the method can be also classified as basic requirements in mobile payment, however, their roles have changed in mobile payment in comparison to traditional payment methods. Users of mobile payment
are often afraid that their personal data gets stolen by hackers or that their mobile phone gets lost/stolen resulting in losing also their private bank information. Therefore, mobile payment platforms need a special security system, which allows them to protect their users’ sensitive data not only offline but also online. Furthermore, fake-proof nature is also becoming more important, as the fear of hackers and virtual thefts is growing, as they are finding new ways to steal sensitive data or convict fraud. Nevertheless, mobile payment services may provide extra security. Reputation and reliability of the method is a basic requirement in both general and mobile payment. However, the latter requires a different way of reliability as it includes a more complex technique, a specific portable device such as smart phone or mobile phone, in some cases a downloaded mobile payment application as well as internet connection.

Factors which may be only performance requirement in general payment methods may be categorised as a basic requirement in mobile payment methods as the following analysis will show.

Portability is classified as a performance requirement in general payment methods. However, the authors of this paper classify the mentioned as a basic requirement in the context of mobile payment as the latter involves a mobile device which enables the user to pay without being physically and timewise bounded (Mallat, 2007). One of the basic characteristics of mobile devices is their portability, therefore, it can be defined as a basic function.

Furthermore, anonymity can be classified as performance requirement for both general and mobile payment. Purchases via internet leave traces not only in one’s personal bank account, but also on the world wide web. Therefore, in mobile payment the importance of anonymity perceived by customer may differ compared to payment methods in general as some customer may require more anonymity than others, transforming it a basic requirement. Thus, it can be stated that some customer will not be grateful about the existence of this function but will be strongly dissatisfied if there is a lack of it (Tontini, 2007). It might be perceived as a problem for some customers, as they prefer to be anonim when purchasing. However, it has to be stated that the appreciation of anonymity depends both on personal feelings and attitudes as well as on the product. There are product purchases which might require more anonymity than others as they can be associated in a more sensitive way.

As mentioned above, it has to be distinguished between payment with and without mobile application. Besides that, smartphones have different operating systems such as android or iOS. Therefore, some of the mobile applications do only work with one of the operating systems, for example, ApplePay which works only with iOS (Arnfield, 2015), therefore, compatibility in an operating system can also be considered as a basic requirement.

**B2B**

Companies must be able to easily integrate mobile payments into their websites, therefore, proper scripts and codes should be provided to these partners.

**4.2 Performance Requirements**

**B2C**

Requirements such as low costs, widespreadness and internationality are classified performance requirement in general payment method by Contius and Martignoni (2003) and they can be under the same category for mobile payment methods as the existence of these requirements lead to a proportional increasing/decreasing of satisfaction (Tontini, 2007). It has to be stated that low costs are in a rather anti-proportional relationship with satisfaction, as satisfaction increases costs decrease and the other way round. Tontini (2007) stated, that
customer normally claim for such requirements. If a mobile payment method is internationally accessible, customers will be in a more convenient situation if they are traveling abroad for example, as they can use their familiar mobile payment method which they use at home. The same argument is valid for widespreadness. Furthermore, low costs lead to a higher satisfaction level as the customer will save money and will therefore claim for this requirement, as the customer will not be willing to pay a lot for the payment method itself.

The mobile payment provider has to accept at least one payment card, in order to make a payment process possible. Thus, it can be identified as basic requirement as the customer will not be satisfied if this function would not exist. Nevertheless, it can be stated that B2C customers also require a mobile payment system which accepts different kinds of cards, and that it is not limited to one single type. While the acceptance for a specific card is a basic requirement for one user, if the mobile payment provider only accepts this specific card. On the other hand, it can also be considered as a performance requirement in case the provider accept multiple cards. The ability to pay with several cards give the customer more flexibility and they may demand for this function. Thus this requirement can be identified as performance requirement.

Furthermore, customer service in order to support and help customers, in case of any issue, can be identified as performance requirement.

It has to be clear how the payment methods work; therefore, both the comprehensibility for general and mobile payment can be classified as performance requirements.

**B2B**

B2B partners also require a wide range of accepted payment method as the lack of options can limited the possible numbers of customers. Whereas the customer only benefits from the offered card options which he/she has a card to, the company has an interest in offering payment via multiple cards in order to satisfy a wider range of customer. Furthermore, guides and support from mobile payment providers in from of customer service can be of value and appreciated.

### 4.3 Excitement Requirements

**B2C**

Due to the fast-changing technology, excitement requirements transform into performance requirements in a very short pace (Tripsas, 2008). New solutions to eliminate external factors that can negatively affect the functionality of mobile payment systems are soon becoming standard.

Tokenization can be considered as one of the most recent developments and the most advanced security system at the moment for online payments done on the spot. The aim of the use of tokens, “fake” virtually substituted payment card credentials, is to limit the amount of stored and transmitted sensitive data over networks. The system generates tokens to reduce the possibility of data theft (Aragona, Longo, & Sala, 2017). At the moment, mobile payment application with stored tokens can be considered as excitement requirements. While most mobile payment systems require internet access to function, some have overcome this limitation by storing tokens in the application thus allowing them to function in dead zones, without internet (Aragona, Longo, & Sala, 2017).

Another excitement requirement can be administrative functions provided by the mobile payment provider where the customer can manage his/her money. It has to be stated that this
can be considered as online banking but in order to remain within the core business, the organisational function could just be a side function.

**B2B**

One excitement requirement may be IT related services. If a company wants to use a mobile payment method, technical implementation of the system could be one example for this category. This extra service can be highly appreciated by a company thus resulting in superior satisfaction. It saves the company time and cost, as they do not have to implement themselves or in case of a lack of knowledge, do not have to hire a third party who would implement the payment method and charge additional fees.

### 4.4 Neutral Attribute

**B2C**

Changing colours in the layout of the mobile payment application can be considered as neutral attributes. As the mobile payment provider offers a very functional and sensitive service, people do not do it with "much enjoyment" or associate amusement with it, therefore, people do not appreciate the changing-colour function. Nevertheless, customers will not feel disturbed or even annoyed if the function exists unless the function is too distinctive. As customer are indifferent regarding the satisfaction of such attributes, they can be identified as neutral attributes (Tontini, Solberg Søilen & Silveira, 2013). However, if there are too many effects such as sounds, colours or animations, customers might get confused and feel disturbed. Hence, such extra features should be removed. They cannot be defined as neutral attributes any longer but as reverse ones.

**B2B**

Neutral Attributes for B2B can be any attributes that create indifference for a company (customer) such as visual non-functional features (sounds, colours or animations).

### 4.5 Reverse Attribute

**B2C**

As a customer is more satisfied if a reverse attribute is absent than if it is present (Tontini, Solberg Søilen & Silveira, 2013), security can be identified not only as a basic requirement, as stated above, but also as a reverse one - depending on the degree of security and steps involved. If a customer has to pass through too many security steps until he/she is able to finish the payment process, he/she will be probably annoyed as the process requires too much perceived time and effort. The customer will find these steps as dissatisfying and will not appreciate the presence of this attribute. Nonetheless, if there would not be any security steps at all, the customer would feel unsafe and would therefore be very dissatisfied (basic requirement). Thus, it can be concluded that not only the presence or absence of an attribute or a requirement is decisive but also the degree of it.

**B2B**

The approval of each payment might an annoying function for a company as it requires too much effort from the company, therefore, it leads in dissatisfaction.
The following figure (fig. 3.) gives an overview of the analysed requirements and attributes in both general and mobile payment contexts.

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<tr>
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<tbody>
<tr>
<td><strong>Basic Requirements</strong></td>
<td>Totality&lt;br&gt;Consistency&lt;br&gt;Durability&lt;br&gt;Reputation and reliability of the method&lt;br&gt;Fake-proof nature&lt;br&gt;Convertibility&lt;br&gt;Ability for circulation&lt;br&gt;Security</td>
<td>Totality&lt;br&gt;Consistency&lt;br&gt;Durability&lt;br&gt;Reputation and reliability of the method&lt;br&gt;Fake-proof nature&lt;br&gt;Convertibility&lt;br&gt;Ability for circulation&lt;br&gt;Security&lt;br&gt;Portability (Anonymity)</td>
<td>Easy integration</td>
</tr>
<tr>
<td><strong>Performance Requirements</strong></td>
<td>Low costs&lt;br&gt;Widespreadness&lt;br&gt;Internationality&lt;br&gt;Comprehensibility&lt;br&gt;Anonymity&lt;br&gt;Portability</td>
<td>Low costs&lt;br&gt;Widespreadness&lt;br&gt;Internationality&lt;br&gt;Comprehensibility&lt;br&gt;Anonymity&lt;br&gt;Flexibility in acceptance of different cards&lt;br&gt;Customer service</td>
<td>Flexibility in acceptance of different cards*&lt;br&gt;Customer service*</td>
</tr>
<tr>
<td><strong>Excitement Requirements</strong></td>
<td>Attractive attributes</td>
<td>Tokenization&lt;br&gt;Payment organisational function</td>
<td>IT related service</td>
</tr>
<tr>
<td><strong>Neutral Attributes</strong></td>
<td>Sound, colours or animations</td>
<td>Sound, colours or animations</td>
<td>Visual non-functional features</td>
</tr>
<tr>
<td><strong>Reverse Attributes</strong></td>
<td>Security (depends on the degree, see explanation above)</td>
<td>Sound, colours or animations</td>
<td></td>
</tr>
</tbody>
</table>

* Same requirements mentioned in B2C and B2B overlap but does not cover the same requirements.

**Fig. 3.** Requirement comparison between general payment and mobile payment methods (B2B & B2C) (author’s table, 2017).

### 5 Conclusion

Based on the application of the Kano model on mobile payment, it can be concluded that customer requirements have transformed and new requirements appeared in mobile payment in comparison to payment methods in general. Whereas many requirements may remain in the same category, some requirements can be classified in mobile payment differently. While many requirements have changed roles - such as security, fake-proof nature, reputation and reliability of the method - most of them remained under the same classification. The technological advancements and the new medium, mobile phone, that accommodates this payment method resulted in new customer requirements.
The analysis conducted can also help mobile payment providers to prioritise which features to keep, improve or remove in order to reach the highest customer satisfaction thus gaining potential competitive advantage over competitors. Thereby, mobile payment provider has to understand the individual requirements from both B2B and B2C customers. In order to acquire B2B partners, B2C requirements has to be fulfilled to the highest extent as insufficient performance, inability for customers to pay, can reduce customer satisfaction, that potentially harm the revenues of the B2B partner.

Due to the sensitivity of the payment industry, soft attributes such as colour of the mobile payment application are not of importance, whereas hard factors such as security and protection and to what degree these are perceived are of great importance.

6 Further research

Former analysis, including this paper, has been focusing on analysing mobile payment as a homogeneous unit. However, future research shall investigate and separate different kinds of mobile payment methods as different customer requirements might be identified then. Another influential factor on customer requirements might be cultural differences. Furthermore, sensitive factors, such as security, may be perceived differently by people from different countries due to the uneven technological development worldwide. Besides the mentioned, the age of customer may also influence the requirements as the younger generation may be more used to the usage of mobile phones thus perceive risk and security differently than people in an older age group who are less experienced with the usage of mobile phones, or even internet.

Finally, it has to be stressed that the mobile phone industry, especially mobile payment, is a fast changing and dynamic industry, thus, new requirements and attributes may occur and are necessary in the future in order to satisfy customer needs.

7 References


