

# SHOPPING ON THE GO – AN ANALYSIS OF CONSUMERS' INTENTION TO USE M-COMMERCE IN GERMANY AND PERU

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## Abstract

*M-Commerce is steadily on the rise – mainly driven by increasing smartphone usage. This so-called “Mobile Revolution” is even considered to be of similar impact as the “Internet Revolution” in the 1990s. This study aims to analyse the level of consumers’ intention to use M-Commerce – and the factors which influence their intentions. Since the level of M-Commerce varies country by country, a comparison of two countries, a developed market (Germany) and a developing country (Peru), has been conducted. The following influencing factors have been analysed: (1) **sense of comfort** (including perceived ease of use, social influence, convenience, appreciation of consultative services and cash preferences), (2) **involvement into E-Business** (including intention to purchase online, trust in online shops and intention to use social commerce) and (3) **perception of safety** (attitude towards data protection, attitudes towards transaction security and safety precautions).*

*The study could identify the most important influencing factors (i.e. perceived ease of use, social influence, convenience, trust in online stores, intention to use social commerce and the general perception of safety). In addition, it showed the major differences between Peru and Germany: Peruvians tend to be influenced by others to a larger extent than Germans, they value consultative selling higher, they have a lower intention to purchase online (but a higher social commerce usage) and data protection/transaction security plays a more important role.*

*These findings should help corporations to better understand the still existing boundaries for M-Commerce and to be able to implement measures to remove them. It should also enable German firms to get a better understanding of the M-Commerce behaviour in Peru – and vice versa.*

**Keywords:** E-Business, E-Commerce, M-Commerce, Mobile Commerce, influencing factors, Germany, Peru

Jel Classification: D11, N3, L81

## 1 INTRODUCTION

The so-called “Internet Revolution” occurred in the late 90s when the web, which was since then only an instrument to be used in research institutions, became accessible for a broad user group.<sup>1</sup> Today, more than 20 years later, the term “Mobile Revolution” is frequently stressed and some authors claim that it is expected to be even more impacting than the Internet Revolution<sup>2</sup>. Around 17% of all Internet traffic comes from smartphones.<sup>3</sup> Smartphone users can watch advertising (Mobile Marketing) or shop online (M-Commerce) while on the go, and even use mobile payment techniques. Both phenomena, mobile cellular subscription and smartphone usage, drive the potential of Mobile Marketing (which includes Mobile Advertising and M-Commerce).

This study aims to analyse the level of consumers’ intention to use M-Commerce and the factors which influence their intentions. Since we assume that this varies country by country, a comparison of two countries, a developed market and a developing country, seems to be most suitable. Germany was selected

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<sup>1</sup> cf. Ryan and Jones (2012), pp. 7 et seq.

<sup>2</sup> cf. Eckstein and Halbach (2012), p. 52

<sup>3</sup> cf. Zolezzi (2013), p. 5

as an example of a developed country, and Peru as an example of a developing country. Both vary in mobile-cellular subscription (Peru has 98 of mobile-cellular subscriptions per 100 inhabitants, versus Germany with 112)<sup>4</sup> and in smartphone/tablet share (Germany has 45% of smartphone/tablet users, i.e. 27.3 million people, versus 17% in Peru, i.e. 3.1. million people)<sup>5</sup>. However, the consumption-based influencing factors will be most likely to influence M-Commerce usage and therefore are the focus of this analysis.

## 2 CONCEPTUAL FRAMEWORK AND HYPOTHESES

### 2.1 MOBILE COMMERCE

In the broadest sense, M-Commerce can be considered as an extension to E-Commerce which *“is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organizations, conducted over computer-mediated networks.”*<sup>6</sup> M-Commerce in contrast to E-commerce refers to transactions that only take place through *mobile devices*, starting from the information search up to the monetary exchange: *“M-Commerce is the buying and selling of goods and services through wireless hand-held devices such as cellular telephones, personal digital assistants (PDAs) and wireless computers.”*<sup>7</sup> While the products and services are ordered online, the payment and the delivery might be online or off-line. In this study the mobile devices analysed will be smartphones and tablets. Due to their size, both are hand-held and portable devices that furthermore contain the same features as PCs and the ability to connect to the internet, enabling mobile transactions.

### 2.2 INFLUENCING FACTORS ON CONSUMERS' INTENTION TO USE M-COMMERCE

When comparing the mobile usage in Germany and Peru, three main dimensions can be used to describe the influence on the use of M-commerce:

<sup>4</sup> cf. ITU (URL)

<sup>5</sup> Cf. Eckstein and Halbach (2012), p. 12 and Ipsos Peru (2013a and b)

<sup>6</sup> OECD (URL)

<sup>7</sup> Michael and Salter (2006), p. 79

Consumers' *sense of comfort*, their *involvement into E-business* and their *perception of safety*. These influencing factors will be explained in the following chapters:

### 2.2.1 SENSE OF COMFORT

The consumers' sense of comfort consists of the

- Perceived ease of use
- Social influence
- Convenience
- Appreciation of consultative service
- Cash preference

#### 2.2.1.1 PERCEIVED EASE OF USE

Perceived ease of use is affected by application features and by "physical features of mobile devices such as its small display screen"<sup>8</sup>. If the usage of M-Commerce is perceived as easy, consumers' acceptance of using the service increases. Considering the wider distribution of advanced mobile devices in Germany and the resulting higher familiarity with M-Commerce applications than in Peru<sup>9</sup>, it is expected that the ease of use is considered to be higher in Germany. We therefore assume:

**H1a:** Perceived ease of use relates positive to consumer intention to use M-Commerce.

**H1b:** Perceived ease of use is estimated to be greater in Germany than in Peru.

#### 2.2.1.2 SOCIAL INFLUENCE

Social influences affect consumer acceptance of mobile technologies and services. Kelman distinguished three categories of social influence: Compliance, identification, and internalization.<sup>10</sup> In all three cases though, an individual strives to gain approval by a third party, independent on whether he is denying himself or strengthening his own position. The third party may involve family members, friends, social networks, public organizations and

<sup>8</sup> Chong et al. (2012), p. 37

<sup>9</sup> cf. Zolezzi (2013), p. 6

<sup>10</sup> cf. Kelman (1958), p. 53

media, or the validation from trusted institutions. The level of individualism influences consumers' perceptions. Individualism according to Hofstede is "the degree of interdependence a society maintains among its members"<sup>11</sup> According to his empirical research, Germany scores a 67 on individualism (versus 16 for Peru) and thus follows an approach of self-actualization. The opinion of a third party will not have the strong influence on an individualistic person as on a group-oriented or collectivistic person. Contrarily, in a collectivistic society as Peru, the opinion will strongly influence an individual's usage behaviour: "In order for consumers to fully embrace M-Commerce services, education and validation from independent and trusted parties are key factors."<sup>12</sup> Therefore, it seems reasonable to assume:

**H2a:** Social influence relates positive to consumer intention to use M-Commerce.

**H2b:** Social influence tends to be lower in Germany than in Peru.

#### 2.2.1.3 CONVENIENCE

Talking about the consumer adaption to new technology trends, including M-Commerce, the perceived convenience is considered a key element.<sup>13</sup> Primarily, convenience is "closely related to time-place flexibility"<sup>14</sup> and the possibility to make best use of one's time when on the go. Besides that, the net reliability contributes to consumer convenience in using M-Commerce. According to ECC<sup>15</sup> a fast loading time of the single pages are important to mobile device users. That is because the data transfer rate for mobile devices is slower than for laptops or PCs. The fear that "M-Commerce transactions can be interrupted or disturbed by an unreliable Internet connection"<sup>16</sup> prevents users from using M-Commerce applications. Due to the fact that the German culture values reliability, achievement and efficiency highly, it is expected that time-consuming inconvenience is considered to be more negative than in Peru. Therefore we assume:

<sup>11</sup> Hofstede (URL1)

<sup>12</sup> Ericsson (2013), p. 3

<sup>13</sup> cf. Kim et al. (2010), pp. 310 et seq.

<sup>14</sup> Okazaki and Mendez (2013), p. 1234

<sup>15</sup> cf. Eckstein and Halbach (2012), p. 42

<sup>16</sup> Ericsson (2013), p. 3

**H3a:** Convenience relates positive to consumer intention to use M-Commerce.

**H3b:** Convenience is estimated to be higher in Germany than in Peru.

#### 2.2.1.4 APPRECIATION OF CONSULTATIVE SERVICE

The attitude towards sales advice is indispensable with a view to the channel decision. The mobile channel has the lowest media richness compared to an in-store channel or even an E-commerce channel<sup>17</sup> and does not allow a direct interaction with the product or service. It is apparent that the intention to use M-Commerce contradicts the intention to consult a sales advisor in person.

In Latin America, the consumer apparently appreciates a high degree of control, also with regard to his expenses<sup>18</sup>. Especially Peru scores high in the dimension of “uncertainty avoidance” (87 versus 65 for Germany) according to Hofstede’s framework.<sup>19</sup> Uncertainty avoidance is the “extent to which the members of a culture feel threatened by ambiguous or unknown situations”<sup>20</sup>. M-Commerce as an arising technology is faced with these doubts, as it does not rebuild the consumers’ control. Following the line of arguments, the following is expected:

**H4a:** Appreciation of consultative selling relates negative to consumer intention to use M-Commerce

**H4b:** Appreciation of consultative selling is estimated to be lower in Germany than in Peru.

#### 2.2.1.5 CASH PREFERENCE

Cash preference describes the usage of cash as the main payment method, alternative to transaction via a bank account, online transactions, including credit card use or PayPal, or even transaction via mobile device, for example per SMS, QR Code or App. In a *cashonomy*, people usually prefer cash payments, no matter their socioeconomic status.<sup>21</sup> Cash is “a fast, convenient and transpar-

<sup>17</sup> cf. Maity and Dass (2014), p. 35

<sup>18</sup> cf. Ericsson (2013), p. 5

<sup>19</sup> Cf. Hofstede (URL1)

<sup>20</sup> Hofstede (URL1)

<sup>21</sup> cf. Ericsson (2013), p. 3

ent means of payment”<sup>22</sup>. In Peru, it is promoted by a high amount of informal sales in the streets or in small shops and hence, the acceptance of cash only. Contrarily, in Germany most jobs are formal, accordingly the payment. Taking these findings into consideration, it is presumed:

**H5a:** Cash preference relates negative to consumer intention to use M-Commerce

**H5b:** Cash preference is estimated to be lower in Germany than in Peru.

### 2.2.2 INVOLVEMENT INTO E-BUSINESS

The involvement into E-Business was determined as relevant for M-Commerce, because it is assumed that both the intention to purchase online as well as the intention to use social commerce have potential to lead digital users towards the use of M-Commerce. Further, the trust in online shops is defined as an additional element, as it influences highly the choice of the purchasing channel. The consumers' involvement into E-Business is therefore determined by the

- Intention to purchase online
- Trust in online shops
- Intention to use social commerce

#### 2.2.2.1 INTENTION TO PURCHASE ONLINE

E-commerce is a forerunner of M-Commerce. M-Commerce is therefore predicted to evolve in a similar way<sup>23</sup>. E-commerce sales in both countries, Germany and Peru, increased by approximately 50% from 2005 to 2011, and are expected to grow further. Peru made US\$ 611 million<sup>24</sup> and Germany € 26.1 billion<sup>25</sup> in E-commerce sales in 2011. With Germany being a more developed country than Peru, the recognition and distribution of E-commerce is higher than in Peru. Therefore, it is expected:

**H6a:** Intention to purchase on-line relates positive to consumer intention to use M-Commerce.

<sup>22</sup> Ericsson (2013), p. 3

<sup>23</sup> cf. Ericsson (2013), p. 6

<sup>24</sup> cf. Selman Carranza (2012), p. 5

<sup>25</sup> cf. Statista (URL)



**H6b:** Intention to purchase on-line is estimated to be greater in Germany than in Peru.

#### 2.2.2.2 TRUST IN ONLINE SHOPS

Consumer trust in an online shop, thus a specific website, is the basic requirement in order to engage into a purchase decision through this online shop, irrespective of whether engaging into E-commerce or M-Commerce. Trust may imply a minimum expectation of an individual, a subjective belief or probability<sup>26</sup> or the “willingness of an individual to be vulnerable, reliance on parties other than oneself, or a person’s expectation”<sup>27</sup>. With regard to M-Commerce, it means the presumption of the customer that the online shop will fulfil the transactions on the previously agreed terms without any incident. The reputation of an online site and the familiarity of an individual with this website have a positive impact on the consumer loyalty and preference over other online shops.

In Germany, a large number of recognized online shops exist: Amazon.de, Ebay.de, and Otto.de are among the most popular ones, all of them have optimized mobile websites and apps. In Peru, the online marketplace Mercadolibre is “the largest e-commerce ecosystem in Latin America”<sup>28</sup>. Seven percent of its sales already come from the mobile channel.<sup>29</sup> The most popular are the online shops which offer coupons, such as Groupon, Ofertop.pe and Descuentosperu.com. However, the optimized mobile website versions are still very few in Peru.<sup>30</sup> Therefore, we assume:

**H7a:** Trust in online shops relates positive to consumer intention to use M-Commerce

**H7b:** Trust in online shops is estimated to be greater in Germany than in Peru.

#### 2.2.2.3 INTENTION TO USE SOCIAL COMMERCE

<sup>26</sup> cf. Kim *et al.* (2008), p. 545

<sup>27</sup> Kim *et al.* (2008), pp. 545 et. seq.

<sup>28</sup> Ericsson (2013), p. 6

<sup>29</sup> cf. Ericsson (2013), p. 6

<sup>30</sup> cf. Zolezzi (2013), p. 11



Social commerce are all activities that involve social networks to assist on-line buying and selling of products and services. Thus, all companies linked to Facebook that either enable a direct purchase from a Facebook store or promote their online stores on a Facebook app or fan page are regarded as social commerce sites.<sup>31</sup> The usage of social commerce reinforces user-generated content, for example user reviews and customer interaction and communication via social network sites. A large number of social network sites are nowadays consumed additionally on a mobile device and generate even more users. The incremental audience generated via mobile devices of Facebook is 23%<sup>32</sup> for example.

When looking at Germany versus Peru, although in Peru a lot less people have access to the internet (34%), 80% of them are Facebook subscribers.<sup>33</sup> In Germany, 83% of the population has access to the internet, but only 31% use Facebook.<sup>34</sup> As the awareness of social media is a lot higher in Peru, it is assumed that the awareness for social commerce is also higher. Hence, the following is proposed:

**H8a:** Intention to use social commerce relates positive to consumer intention to use M-Commerce.

**H8b:** Intention to use social commerce is estimated to be lower in Germany than in Peru.

### 2.2.3. PERCEPTION OF SAFETY

The category perception of safety is based on the perceived risk from the consumers' point of view that negatively affects their acceptance of M-Commerce. The perception of safety is driven by

- Attitudes towards data protection
- Attitudes towards transaction security
- Safety precautions

<sup>31</sup> cf. Ng (2013), p. 610

<sup>32</sup> cf. ComScore (URL2)

<sup>33</sup> cf. Worldbank (URL)

<sup>34</sup> Internet World Stats (URL)

### 2.2.3.1 ATTITUDES TOWARDS DATA PROTECTION

Mistrust about their privacy protection is rated one of the largest obstacle of customers' adaption to M-Commerce.<sup>35</sup> In order to protect the customers' sensitive personal information, a safe data transmission must be guaranteed. Customer might fear identity theft or fraudulent credit card charges when being asked to disclose personal information such as name, email, and credit card number.<sup>36</sup> In general, the attitude towards privacy protection is different in Germany and Peru. Whereas Peruvians are less concerned in giving away private information, German subscribers are more concerned and rather reluctant. When purchasing a product or service through a mobile device, a safe encoding of data is crucially important to German smartphone users.<sup>37</sup> Hence, the following hypotheses are proposed:

**H9a:** Data protection relates positive to consumer intention to use M-Commerce.

**H9b:** Data protection is considered to be more important in Germany than in Peru.

### 2.2.3.2 ATTITUDES TOWARDS TRANSACTION SECURITY

Transaction security refers to the conviction that the "Internet vendor will fulfill security requirements such as authentication, integrity, encryption, and non-repudiation"<sup>38</sup> in order to generate a secure payment via a mobile device.

With respect to online and mobile payment methods, usage preferences differ between countries. In Germany, internet-specific payment methods such as PayPal and "Sofortüberweisung.de" are most popular for mobile purchases, followed by invoice payment, direct debit order, and credit card use.<sup>39</sup>

On the other hand, Peruvians seem to have a lack of trust in online transactions<sup>40</sup>, which includes transactions through mobile devices. Still not all Peruvian credit cards carry a security chip, which makes frauds even easier.

<sup>35</sup> cf. Eckstein and Halbach (2012), p. 48

<sup>36</sup> cf. Kim *et al.* (2008), p. 550

<sup>37</sup> cf. Eckstein and Halbach (2012), p. 43

<sup>38</sup> Kim *et al.* (2008), p. 550

<sup>39</sup> cf. Eckstein and Halbach (2012), p. 45

<sup>40</sup> cf. Euromonitor International (URL)

Therefore it is assumed:

**H10a:** Transaction security relates positive to consumer intention to use M-Commerce.

**H10b:** Transaction security is estimated to be greater in Germany than in Peru.

#### 2.2.3.1 SAFETY PRECAUTIONS

In this context, safety precautions are referred to as measurements to avoid the robbery of mobile devices. Safety precautions also include restricting the usage of a device to avoid robbery. In Germany, this is hardly the case whereas in Peru, the theft of mobile phones is part of everyday's life: According to an OSIPTTEL study, the denounced thefts from January to March 2014 in Peru were 1.1 millions.<sup>41</sup> As the awareness of mobile thefts is high, it is assumed that this fact restricts Peruvians in their intention to use their mobile device for purchasing purposes.

**H11a:** Safety precautions relate negative to consumer intention to use M-Commerce

**H11b:** Safety precautions are estimated to be lower in Germany than in Peru.

### 2.3 SUMMARY

Based on the theory concerning the usage behaviour with respect to M-Commerce in Germany and Peru, eleven factors were distinguished that are determining for the consumer intention to use M-Commerce.

The factors perceived ease of use, social influence, convenience, appreciation of consultative service and cash preference form part of the perceived sense of comfort concerning their contents. It is assumed, that their extent of difference is strongly influenced by cultural aspects, having either a positive or a negative influence on the intention to use M-Commerce.

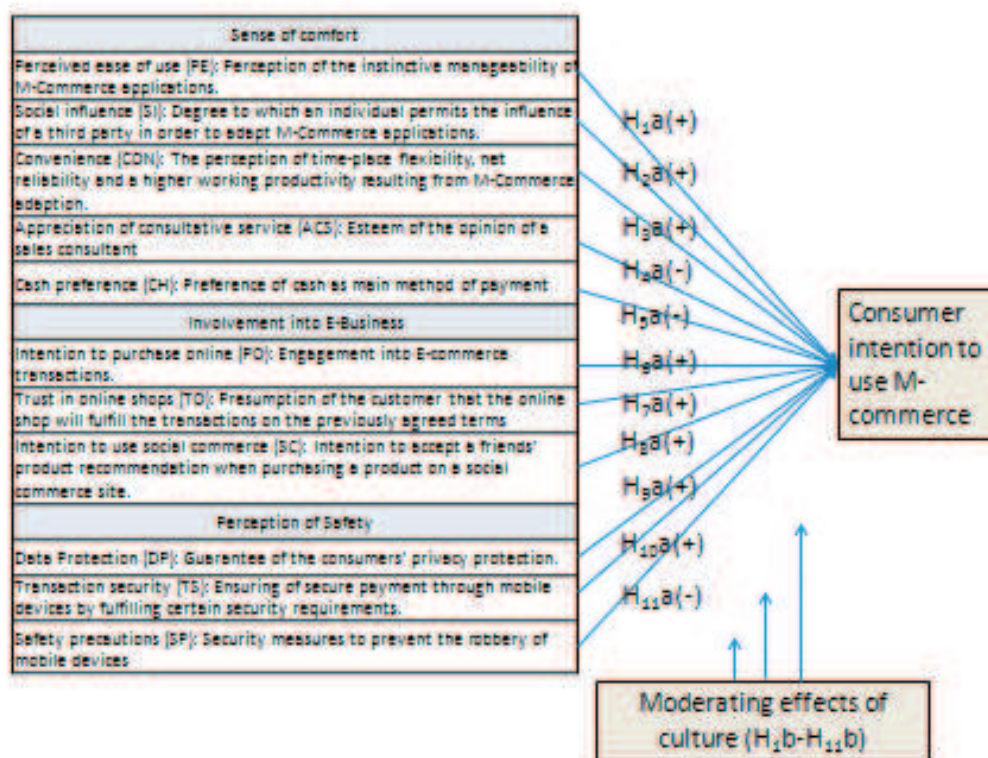
The involvement into E-business includes the factors intention to purchase online, trust in online shops and intention to use social commerce. Comprehen-

<sup>41</sup> cf. OSIPTTEL (URL)

sibly, the more pronounced these factors are, the higher the consumer intention will be to use M-Commerce.

Crucial for an analysis of M-Commerce is the perception of safety; this topic is to be equated with risk avoidance. This article amplifies the three factors data protection, transaction security and safety precautions. Figure 1 depicts the research model. The positive (+) and negative (-) associations between the independent variables on the left hand side and the dependent variable *consumer intention to use M-Commerce* are highlighted. Additionally, the factor *moderation effect of culture* is integrated that will help in the analysis of difference between the countries Germany and Peru.

**Figure 1:** Research model



Facing the rapid development of mobile services and application, as well as the expansion of advanced mobile devices, this article presumes a high potential for M-Commerce worldwide. In a developing country such as Peru, several factors were assumed to be more relevant to mobile device users than in Germany, promising success for M-Commerce: Social influence, appreciation of consultative service, cash handling, intention to use social commerce, and safety pre-

cautions. On the other hand, the factors that were estimated to be greater in Germany than in Peru include perceived ease of use, convenience, intention to purchase online, trust in online shops, data protection, and transaction security. These hypotheses are to be analysed in the empirical research.

### 3 RESEARCH DESIGN

The data report is based on respondents who went through all questions in the questionnaire. Anyhow, the absence of single responses is not ensured.

The questionnaire did not include any open questions (see Appendix). To each topic, one to five questions were asked, resulting into a total of 32. The questions were mainly designed using the Likert scale with a list of choices ranking from “totally disagree” (1) to “totally agree” (7). Only 4 out of 32 questions were nominal-scaled (“Yes”, “No”, “I don’t know”). The answer “I don’t know” was interpreted according to the specific question. This survey was performed with the software package Soscisurvey, a free online-tool that supports online questionnaires.

The survey period was from June 3<sup>rd</sup> to 16<sup>th</sup>, 2014 (two weeks) and targeted exclusively Germans and Peruvians. Therefore, an online questionnaire was sent to inhabitants in the region Baden-Wuerttemberg, Germany and in Lima, Peru. In order to ensure the comprehensibility of the questions, the survey was made available in English, German and Spanish. As the respondents included a broad audience of mobile device users, only quantitative primary data was collected in the online interviews. With Germany as a developed country and Peru representing a developing country, fundamental differences in the usage behaviour concerning M-Commerce were assumed and made an analysis reasonable. 56 respondents from Germany and 52 complete responses from Peru were obtained, which include male and female from the age of 14 to 58. No limitations based on demographic factors were made and data was randomly sampled. Age, gender and occupation of the respondents were requested due to their possible influence.

Out of 169 participants who started the survey, 111 finished it, while 21 cancelled it during the questionnaire. Three participants were excluded from the analysis, because they did not form part of the target population.

Most respondents were female. Further, the survey was distributed mainly among university students, which explains the greatest participation of respondents between the age of 18 and 30, next to the fact that most mobile phone users in Germany<sup>42</sup> and Peru<sup>43</sup> form part of this age group. The variable “age” was coded from a metric scale into an ordinal-scaled variable in order to demonstrate the concentrated distribution of age. The highest portion indicated as their current occupation was either voted as “university” or “working”.

**Table 1** - Demographic profile

Demographic profile		German		Peruvian	
		Number	Percentage	Number	Percentage
<b>Sex</b>	Male	21	37,5%	21	40,0%
	Female	35	62,5%	31	60,0%
	Total	56		52	100,0%
<b>Age</b>	Under 18	13	23,2%	10	19,2%
	18 - 30	42	75,0%	39	75,0%
	Above 30	1	1,8%	3	5,8%
<b>Occupation</b>	Highschool	2	3,6%	2	3,8%
	University	23	41,1%	24	46,2%
	Professional training	3	5,4%	1	1,9%
	Working	26	46,4%	22	42,3%
	Unemployed	2	3,6%	3	5,8%
	<b>Total</b>	56	100,0%	52	100,0%

Further, 7 out of 108 respondents indicated that they were no smartphone or tablet user, nor had access to one of these mobile devices. The overwhelming majority responded that they had access to a mobile device though. Neither sex nor age was found as relevant for MC by conducting an independent t-test or Pearson correlation. No direct correlation could be determined between nationality and MC. Nevertheless, the relations of the independent variables, together with the moderating effects of nationality, are examined in the further analysis.

<sup>42</sup> cf. ComScore (URL1), p. 12

<sup>43</sup> Zolezzi (2013), p. 16



## 4 RESULTS

### 4.1 PERCEIVED EASE OF USE: HIAB

A Linear Regression Analysis was used in order to determine the causality between the variables: MC and PE, all interval-scaled. Hereby, the variation of relevant independent variables (PE) was expected to explain the variation in one dependent variable “I like the idea of purchasing a product or service through my mobile device” (MC). In order to analyse if the nationality has any impact on the model, a dummy variable is created and coded as follows: 1= German, 0= Peruvian.

According to the p-value observation, only three variables have a significant influence, namely “process online banking”, “download music”, and “buy a product”. The variables “find information on products and services” and “browse a search engine” with a p-value > 0.05 are not associated with MC. They were deleted from the model for the further analysis.

According to the new model summary,  $R^2=40.4\%$  of the variation in the dependent variable might be explained by the variation in the independent variables. The variable “buy a product” has the highest standardized Beta-Coefficient. Unexpected was the negative influence of the variable “download music” on MC. It may be that the smartphone users who preferably download music perceive their mobile device as an entertainment media and therefore, are less likely to use it for other purposes or that the download of free music hampers them to engage in commercial M-Commerce. Anyway, The H1a hypothesis thus is approved.

The B-value of “nationality” is -1.365 which means that the MC score for the Germans knows a mean of 1.365 lower than for Peruvians. This leads to the rejection of the H1b hypothesis. Results are summarized in the following Table 2.

**Table 2 – Coefficient table**

Coefficients <sup>a</sup>								
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,476	,475		7,311	,000		
	Perceived Ease of Use: ... to process online banking	,207	,089	,218	2,316	,023	,692	1,445
	Perceived Ease of Use: ... to download music	-,273	,088	-,284	-3,101	,003	,733	1,365
	Perceived Ease of Use: ... to buy a product	,508	,101	,516	5,050	,000	,588	1,701
	Nationality_GE	-1,365	,318	-,343	-4,297	,000	,966	1,035

a. Dependent Variable: Intention use MC: I like the idea of purchasing a product or service through my mobile device



#### 4.2 SOCIAL INFLUENCE: H2AB

In order to determine the relationship among the interval-scaled variables MC and SI, their *bivariate correlation* was analysed. The meaningfulness of the model was approved, as all variables are significant ( $p\text{-value} < 0.05$ ). The Pearson correlation is continuously positive. The strongest positive correlation is found between MC and “SI\_Comments and Likes on FB influence my opinion about a product or service”. With 0.4 it demonstrates a medium linear association. In contrast, “SI\_Mass media will influence my decision to use MC” has the lowest linear association as the Pearson Correlation is below 0.3 (see table 3). Thanks to the above-listed arguments, the H2a hypothesis is approved.

**Table 3 - MC\*SI Correlations**

		Correlations			
		Social Influence: It is a trend to use MC	Social Influence: Mass media will influence my decision to use MC	Social Influence: Family & friends influence me on using MC	Social Influence: Comments and Likes on FB influence my opinion about a product or service
Intention use MC: Given that I had access to MC, I predict that I would use it	Pearson Correlation	,319 <sup>~</sup>	,282 <sup>~</sup>	,289 <sup>~</sup>	,445 <sup>~</sup>
	Sig. (2-tailed)	,001	,003	,003	,000
	N	107	107	105	106
Intention use MC: I like the idea of purchasing a product or service through my mobile device	Pearson Correlation	,210 <sup>~</sup>	,263 <sup>~</sup>	,302 <sup>~</sup>	,405 <sup>~</sup>
	Sig. (2-tailed)	,030	,006	,002	,000
	N	107	107	105	106

<sup>\*\*</sup>. Correlation is significant at the 0.01 level (2-tailed).

<sup>\*</sup>. Correlation is significant at the 0.05 level (2-tailed).

At this point, a nominal variable was introduced into the model: nationality. The results of the Point-Biserial Correlation are shown in table 4. The model is meaningful regarding the association between nationality and the variable “SI\_ Family members and friends influence me on using MC” has a significance level of  $0.033 < 0.05$  and a negative low linear association (Correlation = -0.209). “SI\_ Comments and Likes on FB influence my opinion about a product or service” has a significance level of  $0 < 0.05$  and a negative medium linear relationship (Correlation = -0.351). There is a positive relation between these two SI variables and the Peruvian nationality. This leads to the conclusion that neither mass media nor the awareness of M-Commerce as a trend is important

for Peruvians, but social networks and personal contacts. For all other variables results, that the H2b hypothesis is confirmed.

**Table 4** - SI\*nationality correlations

		Correlations				
		Social Influence: It is a trend to use MC	Social Influence: Mass media, such as radio or TV, will influence my decision to use MC	Social Influence: Family & friends influence me on using MC	Social Influence: Comments and Likes on FB influence my opinion about a product or service	Nationality_GE
Nationality_GE	Pearson Correlation	-,088	-,185	-,209 <sup>*</sup>	-,351 <sup>**</sup>	1
	Sig. (2-tailed)	,370	,057	,033	,000	
	N	107	107	105	106	108

<sup>\*\*</sup>. Correlation is significant at the 0.01 level (2-tailed).

<sup>\*</sup>. Correlation is significant at the 0.05 level (2-tailed).

### 4.3 CONVENIENCE: H<sub>3AB</sub>

It is assumed that there is a positive correlation between the dependent variable MC and the independent variables CON, all interval-scaled. A Pearson correlation analysis is run. Table 5 demonstrates for all independent variables a significant large and positive linear association (Pearson correlations > 0.5, p-value < 0.05), except for the variable “CON\_I am afraid that the internet connection will be interrupted” (p-value 0.661 > 0.05). Therefore, the null hypothesis is rejected and the H3a hypothesis is approved.

**Table 5** - CON\*MC Correlations

		Correlations					
		Convenience: Mobile banking is more convenient than traditional banking	Convenience: Regarding its flexibility, I find that mobile commerce is more convenient than E-commerce	Convenience: M-commerce allows me to improve my work productivity	Convenience: When processing orders via mobile devices, I am afraid that the internet connection will be interrupted	Convenience: Adapting to M-commerce applications helps to save time.	Intention use MC: Given that I had access to MC, I predict that I would use it
Intention use MC: Given that I had access to MC, I predict that I would use it	Pearson Correlation	,542 <sup>**</sup>	,504 <sup>**</sup>	,556 <sup>**</sup>	,043	,568 <sup>**</sup>	1
	Sig. (2-tailed)	,000	,000	,000	,661	,000	
	N	106	105	105	106	105	108

<sup>\*\*</sup>. Correlation is significant at the 0.01 level (2-tailed).

<sup>\*</sup>. Correlation is significant at the 0.05 level (2-tailed).

An independent samples t-test was performed to examine if Germans perceive M-Commerce as more convenient than Peruvians. The scale CON included items regarding convenience related topics: Mobile banking, flexibility,

work productivity, network reliability, and time saving. It was analysed, if the grouping variable nationality makes a difference regarding the convenience.

The first assumption of equal variances applies for all items except for “Adapting to M-Commerce applications helps to save time” (Sig 0.012 < 0.05). Further, for these items the p-values for the t-values were smaller than 0.05. It results, that a significant difference between Germans and Peruvians in their estimation of convenience is assumed.

Peruvians have a higher mean than Germans for all items. Apparently, the highest difference in the mean has “Mobile banking is more convenient than traditional banking” (Mean = 2.91 < 4.79), followed by “M-Commerce allows me to improve my work productivity” (Mean = 3.36 < 4.87). The lowest differences exists for “Regarding its flexibility, I find that M-Commerce is more convenient than E-commerce” (Mean = 4 < 4.96). Resulting from this analysis, the H3b hypothesis is rejected.

#### 4.4 APPRECIATION OF CONSULTATIVE SERVICE: H4AB

ACS was queried with just one interval-scaled variable. Thus, the association with MC is measured with the Pearson correlation, leading to the following results: A correlation exists (p-value 0.001 < 0.05), but different to the assumption, it is positive. Responding “I set a high value on the opinion of a sales consultant when buying” and MC thus have a positive linear association. Therefore, the H4a hypothesis is rejected.

In order to define the influence of nationality on ACS, an ANOVA was performed. In accordance with the Levene’s Test, the assumption of equal variances is fulfilled (Sign. 0.891 > 0.05). Further, the differences in the mean (t-value) are significant (Sign. 0 < 0.05). The group statistics has a higher mean for Peru than for Germany, meaning that Peruvians put more value on the opinion of a sales advisor. The H4b hypothesis therefore can be confirmed.

#### 4.5 CASH PREFERENCE: H5AB

In order to analyze if CH (interval-scaled independent items) has an influence on MC (interval-scaled dependent variable), a linear regression analysis was conducted. The independent variables hereby are:

1. I *prefer cash payments* in comparison to any other payment method.
2. I *trust in payment methods* such as PayPal, bank collection, and credit card use.
3. I would like to proceed with *payment via my mobile device* (e.g. per SMS, QR Code, per App).

According to the R Square, 45.1% of the variation in MC can be explained by the variation in the independent variables. Regarding the independent variables, only the variable “payments with my mobile device” has a p-value below 0.05. This variable has a moderate association with MC (B-value = 0.562). On the other hand, “I prefer cash payments” and “I trust in payment methods” are not significant; these variables are fundamental for the H5a hypothesis. Therefore, a direct indication about the negative correlation between “I prefer cash payments” and MC is not given, and the analysis is cancelled at this point. The finding about the correlation between the variable “payment via mobile device” and “MC” is taken into account later in this paper. The H5a hypothesis therefore is rejected.

The influence of nationality on the dependent variable CH was found as statistically relevant by performing an ANOVA: A significant difference exists only for the variable “CH\_proceed payments via a mobile device”. Differently than expected, this variable is quoted as higher for Peruvians (mean = 4.87) than for Germans (mean = 3.07), this leads to the rejection of the H5b hypothesis.

#### 4.6 INTENTION TO PURCHASE ONLINE: H6AB

It was assumed that a higher PO, leads to a higher MC. ANOVA was performed with a PO as independent variable (“PO\_Have you bought a product or service online before?” Answers: “Yes”, “No”) and MC as dependent interval-scaled variable. First, the Levene’s test of equal variances was checked. As the significance is 0.662 ( $> 0.05$ ), the variances are assumed to be equal. To prove an association between PO and MC statistically, the effect of the factors must be significant (p value smaller than 0.05), which is not the case ( $p=0.238$ ). Thus, the H6a hypothesis is rejected.

To examine the relation between nationality and PO, the binary scaled item “Have you bought a product or service online before?” was examined in asso-

ciation to MC. 80.8% of Peruvians and 98.2% of Germans indicated that they have purchased a product or service online before. According to the Chi-Square test, this difference is statistically significant and meaningful, anyhow with a small association (PHI = 0.288;  $p=0.003$ ). Anyway, the H6b hypothesis can be approved.

#### 4.7 TRUST IN ONLINE SHOPS: H7AB

The relation between MC, TO, and nationality was determined with OLS. According to this output, 30.5% of the variation in the dependent variable might be explained by the variation in the independent variables. All dependent variables have a significant influence on MC (Sig. < 0.05). The coefficients displayed in table 6. The unstandardized coefficient for nationality is -.772 which means that the MC score for the Germans knows a mean of 1.365 lower than for Peruvians. This analysis leads to an approval of the H7a hypothesis and to a rejection of the H7b hypothesis.

**Table 6 - Coefficient Table**

Coefficients <sup>a</sup>								
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1								
(Constant)	1,917	,686		2,797	,006			
I consider German online shops as trustworthy (e.g. otto.de, ebay, amazon.de)	,404	,120	,323	3,363	,001	,818	1,223	
I consider Peruvian online shops as trustworthy (e.g. mercadolibre, ofertop, descuentoperu)	,258	,118	,242	2,187	,031	,618	1,617	
Nationality_GE	-.772	,374	-.215	-2,061	,042	,696	1,436	

a. Dependent Variable: Intention use MC: Given that I had access to MC, I predict that I would use it

#### 4.8 INTENTION TO USE SOCIAL COMMERCE H8AB

It is assumed that there is positive correlation between SC and MC. For the variables “SC\_ I have a strong intention to purchase a product online if the product is recommended by my social network friends” and “MC\_ I like the idea of purchasing a product or service through my mobile device” the Pearson correlation is almost 0.6, indicating a moderate to strong association between the two variables. Therefore, the H8a hypothesis is confirmed.

The binary scale “I have ordered a product or service before through a social network site (e.g. Facebook)” has a statistically significant moderate correlation with nationality according to the Chi-Square test (Cramer’s V = 0.413;

$p=0.000$ ). Accordingly, 41.2% Peruvians indicated that they have purchased on a social commerce site before, whereas only 5.4% Germans indicated the same. Peruvians therefore are more likely to respond to social commerce. Thus, the H8b hypothesis is confirmed.

#### 4.9 DATA PROTECTION AND TRANSACTION SECURITY H<sub>9</sub>/I<sub>OAB</sub>

Considering DP, the general statement “I often refuse to provide my personal information such as name or email address in order to access information in which I am interested” does not show any significant correlation to MC. Anyhow, one significant relation ( $p\text{-value} < 0.05$ ) is found between MC and “DP\_I think using M-Commerce puts my privacy at risk”. In compliance with the formulation of the question, the association is negative. Anyhow, there is only a small linear association (Pearson Correlation:  $-0.235 < 0.3$ ). The significant association ( $p\text{-value} < 0.05$ ) between MC and TS is 0.526, a moderate linear association. This leads to the approval of the H9a and H10a hypotheses.

In a following ANOVA, the dependency of nationality (nominal-scaled) on DP and TS (interval-scaled) was examined. Table 9 proves that the model is meaningful for all variables except for “TS\_Online transactions are secured” ( $p=0.105$ ).

**Table 7 - DP\*TS\*nationality ANOVA**

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
DP I often refuse to provide my personal information such as name or email address in order to access ...	Between Groups	27,634	1	27,634	10,202	,002
	Within Groups	284,422	105	2,709		
	Total	312,056	106			
DP I think using M-commerce puts my privacy at risk	Between Groups	58,109	1	58,109	22,378	,000
	Within Groups	272,657	105	2,597		
	Total	330,766	106			
TS Online transactions are secured	Between Groups	6,454	1	6,454	2,669	,105
	Within Groups	251,509	104	2,418		
	Total	257,962	105			
TS Payments made through M-commerce are processed securely	Between Groups	55,132	1	55,132	23,609	,000
	Within Groups	247,534	106	2,335		
	Total	302,667	107			

For the three relevant variables, the mean plots showed clearly that the variables “DP\_ I often refuse to provide my personal information such as name or email address in order to access information in which I am interested” have



higher means for Germans than for Peruvians, while for the variable “TS\_ Payments made through M-Commerce are processed securely” the contrary applies. This leads to the confirmation of the H9b and H10b hypotheses.

#### 4.10 SAFETY PRECAUTIONS H11AB

In this analysis the interval-scaled variable MC “I like the idea of purchasing a product or service through my mobile device” is explained by taking into account the nominal-scaled variables regarding safety precaution. Therefore, a *two-way ANOVA* was performed with “SP\_ My own or one of my friend’s mobile phone has been stolen before” and “SP\_ Are you afraid to make a purchase via a mobile device due to the fact that it could be stolen?” as categorical variables. As the Levene’s test for equality of variances is  $\text{Sig } 0.162 > 0.05$ , results are considered as homoscedastic. The significance of the corrected model is  $0.010 < 0.05$ , which means that there is a significant effect of the variables on MC, but only the variable “Are you afraid to make a purchase via a mobile device due to the fact that it could be stolen?” is significant ( $p\text{-value } 0.047 < 0.05$ ). This variable explains 16.7% of the dependent variable. Therefore, the H11a hypothesis is confirmed.

84.6% of Peruvians indicated that they know somebody whose mobile device has been stolen whereas only 46.6% of German could mention the same. Further, 46.2% of Peruvians said that they were afraid to purchase via their mobile device due to safety risks, but only 27.3% of Germans. Anyway, a correlation between the item “Are you afraid to make a purchase via a mobile device due to the fact that it could be stolen?” and nationality could not be statistically proven, as the model performing a Chi-Square test was not found significant ( $p\text{-value is } 0.085 > 0.05$ ). Therefore, the null hypothesis does apply and the H11b hypothesis is rejected.

## 5 DISCUSSION AND RECOMMENDATIONS

In this last chapter the findings of each hypothesis are discussed. Fourteen hypotheses were confirmed and eight hypotheses were rejected. For Cash Preference no hypothesis was found as relevant. Five of the rejected hypotheses concerned nationality, the other three referred to MC.



### ***H1ab: Perceived ease of use***

PE has a significant influence on M-Commerce, but only regarding activities that are directly connected to M-Commerce transactions. Anyhow, activities such as browsing a search engine or searching product information are not associated with M-Commerce. This might be a sign that most people use their mobile device for browsing products and information gathering only and prefer a laptop or PC for the purchasing activity. One reason according to this study is that not a lot of knowledge exists regarding how to download music or buy a product via a smartphone, or it is experienced as too complicated. In order to optimize the buying decision process and to lead the mobile device user straight to the purchasing via a smartphone or tablet, it is essential to facilitate the process from information gathering up to integrating into a transaction via mobile. There should be only a few steps between the product's presentation and the product's ordering. The visualization must be in accordance with the smartphone's or tablet's smaller display.

Different to the assumptions made on the hypothesis, Peruvians more than Germans, appreciate perceived ease of use. Anyway, according to further analyses, this influence was not found as statistically relevant.

### ***H2ab: Social influence***

Two items were found to have an impact on the consumer intention to use M-Commerce: "Comments and Likes on Facebook influence my opinion about a product or service" and "Family members and friends influence me on using M-Commerce". The social influence for Peruvians should not be underestimated by German firms. Contrarily to Germans, Peruvians attach high value to the attitudes in their personal environment, also when it comes to the usage of M-Commerce. Comments and recommendations on social networks such as Facebook will be decisive for their openness to the new technology. Thus, it is recommended to promote on the firm's Facebook site and other social networking activities in order to be more personal to the Peruvian media user, and from there on, advertise their products. As Facebook is popular among mobile devices users, the firm's site might pass on the user directly to a mobile version of the firm's website, including its mobile online shop. Vice versa, the mobile version of the firm's website is directly connected to Facebook, Twitter, and other social network sites. The mobile online shop should give the opportunity to communicate between the users and to evaluate and comment on products.

### ***H3ab: Convenience***

Convenience was found to have a strong linear association with the intention to use M-Commerce. Different than expected, the fear that the internet connection is interrupted when processing M-Commerce was not confirmed. As an application, mobile banking has a high potential. Further, Peruvians perceive M-Commerce as more productive than Germans. Thus, a success factor might be the presentation of the benefits of M-Commerce, with focus on the work productivity and flexibility. It must be highlighted, that the usage of M-Commerce is easy for modern mobile device users, it helps them to save time and to become more productive. By promoting applications that are connected to M-Commerce, the interest about M-Commerce applications will automatically rise.

### ***H4ab: Appreciation of consultative services***

Peruvians put a higher value on the consultation of a sales advisor. Anyway, this does not have a significant influence on M-Commerce.

### ***H5ab: Cash preference***

The high usage of cash in Peru seems not to be an obstacle for M-Commerce, since Peruvians are open for new payment methods which are closely linked to M-Commerce.

Though an influence of cash preference on M-Commerce could not be demonstrated, another finding was made: The item "I would like to proceed payments via a mobile device" has a significant influence on M-Commerce and is more relevant for Peruvians than for Germans. It is recommended, to invest into new payment methods such as payment per SMS, QR code, or App and to offer a variety of choices on the method of mobile payment.

### ***H6ab: Intention to purchase online***

It was found that the intention to purchase online influences the consumer intention to use M-Commerce. The assumption that Peruvians use less E-commerce than Germans was proven, but has no significant influence on intention to use M-Commerce.

### ***H7ab: Trust in online shops***

As expected, trust in online shops influences positively the intention to use M-Commerce. Different than expected, trust is estimated to a larger extent in Peru than in Germany. Therefore, trustful M-Commerce sites are essential. Germans generally trust Peruvian online shops less, than Peruvian trust German online shops. Foreign companies tend to have a better reputation in the Peruvian population, which means that a German company might benefit from this recognition.

#### ***H8ab: Intention to use social commerce***

Social commerce was identified as a driver for M-Commerce. Peruvians are much more likely to engage into social commerce, which should be integrated into an overall strategic digital approach. A more personal relationship to the consumers is a key element, taking place on a social media platform, such as Facebook, Twitter, Stripe, etc. The distribution of videos, advertisements and announcements of new products on social platforms can be encouraged, as well as the presentation of behind-the-scenes stories. Above all, personalized content is expected to make the consumers interact and start buying from a social platform.

#### ***H9ab: Data protection***

The influence of data protection on the intention to use M-Commerce is very small, and affects Peruvian less than German mobile device users. As a result, additional data protection methods like the ones in Germany are not believed to be necessary in Peru.

#### ***H10ab: Transaction security***

Transaction security is closely related to the intention to use M-Commerce in the factor analysis and showed a high correlation. As presumed, transaction security is even more important for Peruvians than for Germans, due to high fraud rates. Therefore, as a first step, mentioning security standards as obvious as possible will generate more trust in the specific online shop. As a second step, it is crucial to use secure payment methods.

#### ***H11ab: Security precautions***

It was found that the perception of a safe environment has an influence on the intention to use M-Commerce. However, the nationality was not found as statistically significant.

## 6 CONCLUSION

Three major areas have been identified as most influencing for the usage intention for M-Commerce in the German-Peruvian context: Sense of comfort, involvement into E-business, and perception of safety. It was found, that by implementing M-Commerce in a developing country such as Peru, other elements are meaningful to secure its success, in comparison to Germany.

First, the sense of comfort is generally more essential for Peruvians when it comes to using M-Commerce. Convenience and a perceived ease of use, but also social influences and consultative service play a more important part to them than to German mobile device users. Second, social commerce contrarily to traditional E-commerce, finds great acceptance, as personal contributes are very popular among Peruvian mobile device users. Adaption to M-Commerce in Peru will depend on the people's trust in a specific mobile app or shop, its image or recommendations by a user platform. Third, due to the insecure environment in Peru in contrast to Germany, people value highly transaction security. All these aspects need to be taken into account by German firms that want to make M-business in Peru; under these considerations, M-Commerce will be successful.

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## APPENDIX (QUESTIONNAIRE)

### *Perceived Ease of Use*

It is easy to use my mobile device to find information on products and services

It is easy to use my mobile device to process online banking

It is easy to use my mobile device to browse a search engine

It is easy to use my mobile device to download music

It is easy to use my mobile device to buy a product

### *Social Influence*

It is a trend to use M-COMMERCE (such as mobile banking, purchase through mobile devices, etc.)

Mass media, such as radio or TV, will influence my decision to use M-Commerce

Family members and friends influence me on using M-Commerce

Comments and "Likes" on facebook influence my opinion about a product or service

### *Convenience*

Mobile banking is more convenient than traditional banking

Regarding its flexibility, I find that M-Commerce is more convenient than E-commerce

M-Commerce allows me to improve my work productivity

When processing orders via mobile devices, I am afraid that the internet connection will be interrupted

Adapting to M-Commerce applications helps to save time.

### *Appreciation of Consultative Service*

I set a high value on the opinion of a sales consultant when buying

### *Cash Preference*

I prefer cash payments in comparison to any other payment method

I trust in payment methods such as PayPal, bank collection, and credit card use

I would like to proceed with payment via my mobile device (e.g. per SMS, QR Code, per App)

### *Intention to purchase online*

Have you bought a product or service online before?

I am familiar with online transactions (online baking, online shopping, online services)?

### *Trust in online shops*

I consider German online shops as trustworthy (e.g. otto.de, ebay, amazon.de)

I consider Peruvian online shops as trustworthy (e.g. mercadolibre, ofertop, descuentosperu)

*Intention to use social commerce*

I have a strong intention to purchase a product online if the product is recommended by my social network friends (e.g. facebook)

I have ordered a product or service before through a social network site (e.g. facebook)

*Data Protection*

I often refuse to provide my personal information such as name or email address in order to access information in which I am interested

I think using M-Commerce puts my privacy at risk

*Transaction Security*

Online transactions are secured

Payments made through M-Commerce are processed securely

*Safe environment*

My own or one of my friend's mobile phone has been stolen before

Are you afraid to make a purchase via a mobile device due to the fact that it could be stolen?

*Intention to use M-Commerce*

Given that I had access to M-COMMERCE, I predict that I would use it

I like the idea of purchasing a product or service through my mobile device