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**Innovative Payment E-Commerce Solutions and their Potential Impact on Customer
Experience and Revenues**

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Abstract: Innovative Payment E-Commerce Solutions and their Potential Impact on Customer Experience and Revenues

Digitisation, globalisation, and new disruptive technologies are consistently changing the way consumers buy goods and services and forcing merchants to attract customers with more customer centric approaches. As research indicates, the checkout process and especially the offered modes of payment can have a strong influence on the overall customer experience and revenues consequently generated by customers.

This study aims to contribute to related research by collecting data from online shop customers, gaining more insight into their preferences and motivation in order to shed more light onto the interrelationship of shopping experience, customer satisfaction and shop revenues, especially with regard to innovative payment solutions.

Keywords: E-commerce, customer experience, customer satisfaction, innovative payments

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1 Introduction

While the financial crisis in 2009 resulted predominantly in a loss of trust into the traditional banking system, it also had a significant impact on any financial service banks usually offer, including available payment methods in e-commerce (cp. Ghadami, Aghaie, and Mohammadkhan 2010; Thalassinos and Thalassinos 2018). Despite of related challenges, the evolution of consumer payment methods continues to unfold, reshaping methods of payment diversely around the globe (cp. Grüşchow, Kemper, and Brettel 2016). Payment landscapes emerge from innovations, technology, culture and habits that are related to unique local factors. This results in geographically diverse payment preferences of consumers in retail and e-commerce (cp. Capgemini Research Institut 2020). Therefore, the study at hand considers only the European e-commerce market.

The payment and e-commerce market in Europe changed significantly during the past years mainly driven by consumer trends and new, competitive financial products with innovative technologies (cp. Rokicki 2018). As a result, this means a strong increase in e-commerce combined with alternative payment methods in the online segment and the proliferation of contactless and digital wallets. This will be supported by a greater social acceptance of the shift from cash to digital payments as well as by changing payment habits and consumer behaviour (cp. Capgemini Research Institut 2020). According to Capgemini's World Payments Report (2020), the number of non-cash transactions will rise from 229.1 billion in 2020 to 307.5 billion in 2023 only in Europe. As a side effect, this could result in a change of customers' attitude towards such payment methods and a dynamic growth in e-commerce and cashless payments, as merchants automatically attract more customers and gain more traffic on their online shops.

While such growing numbers would indicate a clear trend of use and acceptance of innovative payment methods, success appears to be driven by an overall positive customer

experience throughout the whole shopping process, in order to create and maintain a loyal customer base and increase revenues from a merchant's perspective.

Customer Experience (CX) is highly valuable in such a competitive market like the e-commerce segment (cp. Bilgihan, Kandampully, and Zhang 2016). For merchants, the payoff for great customer experience is tangible, with price premiums of up to 16 percent on goods and services as well as higher customer loyalty (Clarke and Kinghorn 2018, 3). According to a management study about what customers value most during their customer experience, efficiency, convenience and easy payment are under the top five (Clarke and Kinghorn 2018, 6). This shows that technology is not the only path to ensure superb customer experience; but it enables it. CX needs to be seamless, convenient and innovative throughout the whole shopping experience. Coming back to scientific research on that subject matter, Bilgihan, Kandampully and Zhang (2016, 102 ff.) summarise a number of factors, such as locating the actual website, ease of use, perceived usefulness, hedonic and utilitarian features, perceived enjoyment, personalisation, social interactions and multi-device compatibility, as key to the overall customer experience and link a positive one to increased revenues.

At the same time, they emphasise the need for future research “to empirically test the antecedents and outcomes of unified customer experience. Future research is also advised to focus on the social aspect of e-commerce in creating a positive experience” (Bilgihan, Kandampully, and Zhang 2016, 117). With regard to revenue and profit, Bilgihan et al. (2014, 65) refer to Georgiadis and Chau (2013 185 f.) when claiming that, so far, “there has been little consideration on examining and evaluating user experience in the e-business context. The customer's experience is a very important factor for the success of any e-commerce practice because it influences the customer's perceptions of value and product/service quality, and therefore is affecting customer loyalty and retention”.

1.1 Research Problem and Approach

This master thesis aims to particularly respond to the above stated field of study and calls for further research into customer experiences in e-commerce and impact on revenues by focusing on innovative payment e-commerce solutions and therein specifically on the checkout and payment processes as well as the experiences customers discover within this journey. It will be also relevant, as indicated above, how such experiences impact on the merchants' revenues and profits. The focus on the actual payment methods results from a number of concerns that literature implies. Hu, Lee and Kou (2005, 3 ff.) highlight issues of security during the payment process as a main issue impacting on trust and conduct of the e-commerce customers. Niranjnamurthy (2014) responds to such concerns with a discussion of PayPal as a possible solution in terms of security but also protection of data privacy. Hsieh (2001) provides an overview of several different tools available for e-commerce payment at the time his work was published, while Grüşchow, Kemper and Brettel (2016) study what payment methods are preferred by customers under which circumstances, only indirectly linking their findings to customer experience and revenues. Therefore, the issues of the checkout and payment processes, the experiences of customers and the correlation with revenues are addressed at times, but lack any focused attention. For this reason, this research caveat needs to be addressed, as there are remaining inconveniences and trust issues with online payment methods regarding security, personal data etc.

In order to do so, a brief literature review will be conducted in chapter 2 of the thesis in order to provide an overview of the theoretical background and to create the necessary basis for the methodological approach described in detail in chapter 3, forming the input and theoretical framework for the applied multi-choice, closed-questions questionnaire to be supplied to a sample of potential respondents. The descriptive findings of this online questionnaire will be visualised and summarised in chapter 4, before a critical discussion of these findings will be

conducted in chapter 5. The thesis will conclude with a summary and recommendations for further research.

1.2 Research Questions

As detailed above, the main research question of this thesis is, how innovative payment e-commerce solutions potentially impact customer experience during payment and checkout and how this might, in turn, affect merchants' revenues.

This general research question might be subdivided into three more precise research questions:

1. What innovative payment solutions exist and find application in practice?
2. How are innovative payment solutions affecting customer experience (positively/negatively)?
3. What is the relationship between customer experience and revenues of an online shop?

2 Theoretical Background

The following chapter will address the overall online shopping process, as described in the literature, as well as the main factors involved in a satisfying customer experience during the same process, their potential improvement and, eventually, an overview of existing innovative payment solutions. All terms explained in the next sections are connected to an online shopping process with a special focus on the checkout journey. The data and sources used are mainly focused on Europe, as there are great differences between the different regions in terms of economic, political, regulatory, infrastructural, linguistic and cultural aspects of payment solutions and customer experience.

2.1 The Online Shopping Process

Since the beginning of e-commerce in the late 1990s and early 2000s, the online shopping processes, and steps included in such a process, have developed significantly. Apart from

technical requirements and a step-by-step understanding, an online shopping process today is supposed to be strongly connected to the customers' behaviour, also according to a number of factors related but not limited to physical, ideological, pragmatic and social dimensions (cp. Michaud Trevinal and Stenger 2014). More concrete and with the intention to suggest a contingency theory based model, Khalifa and Liu (2007) state that habits in online shopping and the related experience have effects on the intention to revisit an online shop by providing satisfaction and online repurchasing intention. Even more scientifically, Mosteller, Donthu and Eroglu (2014, 2486) summarise their findings stating "that (1) perceptual fluency affects both cognitive effort and positive affect experienced during online shopping and (2) cognitive effort and positive affect influence judgments about the perceived decision quality of the choice made."

From a practical perspective, one could imagine that potential customers recognise needs for products and services in two ways: Some plan to buy a product and search on the internet to get information concerning the most suitable product and online shop that fulfil their criteria. Other consumers are more impulsive buyers and just go online and purchase products directly without any planning or comparison. It can be assumed that those buyers are not emotionally connected to a merchant or purchase products only from a specific merchant due to former good experience. They want to satisfy their need quickly and in the most convenient way. In both ways, a consumer gets through every step of an online shopping process; but, for the merchant, it is complex to create more value to both customer groups.

To potentially substantiate similar assumptions, Li and Zhang (2002, 508) provide important meta-study of past research, allowing an extensive overview and evaluation. According to these authors, as they refer specifically to Liang and Lai (2000), online shopping behaviour can be defined as the process of purchasing products or services via the Internet and consists of five

main steps: the search for need-related information, evaluation, choosing, transaction and post-sales services.

To follow the focus of this paper, only the steps checkout portal, payment and confirmation were analysed in depth. Moreover, Li and Zhang (2002, 509 f.) provide a taxonomy of consumer online shopping attitudes and behaviour and hypothesise about the relationships of the presented factors (see Figure 1). As can be seen in this model, the authors distinguish between inherent antecedents, such as the overall external environment, demographics, personal and vendor and/or product characteristics and the website's quality; but also the customers' attitude towards online shopping, their intentions, the decision-making process and the actual purchasing or checkout, i.e. the actual purchase and payment. Therefore, as indicated above, this part of the overall process is relevant for the overall customer experience.

Data from the Global Consumer Survey 2020 conducted by Statista shows that 57 percent of UK respondents and 65 percent of respondents from Germany do online research before a major purchase (cp. Kunst 2020a; 2020b). Furthermore, the study also states that 54 percent and 50 percent, respectively, perceive customer reviews are helpful for doing research. When considering the actual payment preferences, 54% customers preferred cashless payment on online payment sites when shopping online (cp. Sabanoglu 2020). In European Nordic countries, “[the] most popular payment method for online purchases [...] in 2020 was by debit or credit card. The number of card payments per capita increased over the years in all the Nordic countries. As of 2017, 434 card payment occasions were reported in Norway. Denmark had 367 card payments per capita that year. While 38 percent of the Nordic respondents preferred card payment, 22 percent chose invoice payment. PayPal or similar systems were preferred by 21 percent of the respondents to the survey and direct bank payment – by 14 percent” (Sabanoglu 2021). Regarding the actual shopping experience, data from Statista regards the ease of the

checkout process, delivery prices and payment options as very important in general (cp. Richter 2018; Niinimäki 2020).

2.2 Customer Experience and Possible Improvement

The previous section underlined the importance and relevance of the payment and checkout step of the overall online shopping experience for both the customer and the vendor. In many sources, there are also indications for the potential impact on spending behaviour and/or vendors revenues. Mangiaracina, Brugnoli and Perego (2009) offer a rather general study but mirror the before mentioned core elements of the overall customer experience; but differentiating between the impression of the actual webpage, the product discovery, presentation and evaluation, the cart management and, of course, the checkout procedure, including the payment options. Based on that input, they offer what they call an experience curve, permitting the evaluation of customer experiences during online shopping, also allowing the comparison between vendors but also the identification of potential weaknesses that need to be improved. Bilgihan, Kandampully and Zhang (2016, 106 ff.) add to this idea by focusing on the actual website/app design, the ease of use of these, the perceived usefulness, hedonic and utilitarian features the website/app is offering, the perceived enjoyment, personalisation and social interactions that are permitted to the user; as well as any multi-device compatibility as important prerequisites for a fulfilling customer experience, potentially resulting brand engagement and positive word of mouth. Moreover, they support a direct link between a positive customer experience—defined in such a model—and the positive impact of vendor revenues (Bilgihan, Kandampully, and Zhang 2016, 102).

When it comes to the metrics behind the customer experience, Grewal, Levy, and Kumar (2009) highlight, from a general retailing perspective, that it is paramount to manage the overall process and point of contacts. They define the customer's experience as "every point of contact at which the customer interacts with the business, product, or service" (Grewal, Levy, and

Kumar 2009, 1) and they focus on macro factors in order to shape such an experience, e.g. promotion, price, merchandise, supply chain and location; but they apparently leave out the specific e-commerce perspective, not dissimilar to the general contributions of, for example, Morgan and Rego (2006) or Verhoef et al. (2009), in which the importance of the related dynamics between customer and vendor are emphasised.

More constructive is the work of Peppers and Rogers (2016), highlighting the role of customer data and respective data analytics when it comes to evaluating, controlling and steering customer experience; but, even more so, Liuqu, Fan and Fu (2015), presenting the net promoter score (NPS), continuous purchase intention (CPI) or the China Customer Satisfaction Index Model (C-CSI) as potentially useful metrics to develop customer satisfaction toward a mutually beneficial customer experience.

According to their work, NPS expresses the likeliness of customers to recommend a product or service to others on a scale from 0 to 10. Eventually, NPS distinguishes between detractors, passives, and promoters. The net promoter score is the difference between detractors and promoters (Liuqu, Fan, and Fu 2015, 81). Regarding continuous purchase intention, the authors state that this concept refers to “the subjective probability that a customer will continue to purchase a product from the same online seller [...]. Prior research has indicated a set of determinants of CPI, including but not limited to perceived usefulness, trust, satisfaction, switching cost, and perceived value” (Liuqu, Fan, and Fu 2015, 83).

Finally, for the “China Customer Satisfaction Index Model (C-CSI) [21], three metrics are considered, including total satisfaction (TS), factor satisfaction (FS), and continuous purchase intention (CPI). TS and CPI are both measured on a 5-point Likert scale, and calculate the percentage of the top 2 answers, very satisfied and satisfied, and willing to buy very much and willing to buy, respectively. FS considers both the satisfaction and importance of a set of sub-attributes of products, service, or images. Each satisfaction attribute is weighted accordingly.

C-CSI score is the sum of the three metrics, with each given a specific weight” (Liuqu, Fan, and Fu 2015, 84).

From a practical point of view, and again highlighting the role of the checkout and/or payment process, blogposts such as found on the PaymentsJournal of Currencycloud (cp. n.a. 2019; Currencycloud 2017) focus on the financial technology behind it and emphasise the need for convenience and ease of use of webpages and/or mobile apps, as well as a throughout customer follow-up process, especially at the point of checkout and payment in order to avoid frustration and loss of interest, i.e. the abortion of the purchase and thus loss of revenue. All these works assume a strong relationship between a positive customer experience and revenues of an online shop; and the above described facilitators should be monitored and continuously improved, if showing any deficits.

2.3 Innovative Payment Solutions

As has been indicated before by various research, a positive customer experience regarding the checkout and/or payment process is of great importance for customer satisfaction, successful sales and even returning customers. All of these factors have a positive impact on revenues of online businesses. So, what innovative payment solutions already exist?

As early as in 2003, Gordijn and Akkermans (2003) were critically assessing innovative e-commerce ideas, admitting a lack of knowledge about development and implementation of such at this point in time. Consequently, their suggested approach was rather explorative and not focused on specific areas of the online sales process. Hartmann (2006) goes beyond such limitations and focuses on mobile payments and online banking methods as some potential innovative methods of that time, which have become a standard today.

Nonetheless, it is surprising how little research evidence of actual innovative payment solutions, i.e. single platform approaches, choice of different payment options, integrated payment pages etc. exist. It might not come as a surprise that many people in Western countries

consider PayPal the most innovative payment service, followed by the offers of major smartphone manufactures or traditional online banking solutions (cp. Kunst 2019). In 2019 already, it was found that PayPal had a market share of 20.2% in Germany alone. In terms of convenience, data available on Statista indicated that this particular service is ranked highest, however, just marginally ahead of credit card usage; but more trusted than cash-in-advance (cp. Peters 2019; Koptug 2020).

While such level of convenience is certainly given by PayPal, security and data privacy might be another issue for innovative payment solutions. According to the Statista Research Department (2020), “European consumers rated mobile one-time passcodes such as SMS codes sent to mobile devices as the leading method that provides the most secure experience. [...] another authentication method that was found most secure by consumers was a fingerprint biometric. This method was not viewed as delivering the best user experience, however. As opposed to 43 percent of consumer who found it secure, only 26 of them thought it was conducive to best experience.”

While actual examples of innovative payment solutions are scarce in scientific literature, there at least appears to be a strong indication for an impact of such on customer experience. Vakulenko et al. (2019, 465), for example, make a strong plea to e-retailers to customize related offers according to customers’ needs, in order to improve shopping experience and create consumer loyalty. Similarly, Korella and Li (2018), in their comparison of retail payment behaviour between China and Germany, support that mobile payment methods, such as Alipay or WeChat, are in a 55% to 65% span during the point of sale in China already, emphasising the rising importance of similar offers also for European countries in the future.

3 Methodology

In order to respond to the above indicated research gap and to attempt to provide answers to the above stated research questions, this thesis applies a quantitative survey, using the gratuitous

available online tool Qualtrics (<https://www.qualtrics.com>). To fulfil all requirements in order to get suitable data that matches the standard question types, single and multiple choice questions were used for general questions and first clustering questions. To evaluate specific questions, more advanced question types were applied, e.g. the Net Promotor Score (NPS) and the Matrix Table.

3.1 Data Sample

In total, 100 responses were gathered throughout the study. Potential respondents were selected based on availability and identified by the author's and university's network. Once selected, they were approached via email and/or social networks. The survey was distributed with the snowball method (cp. Emerson 2015) through social media networks, via the university and private network as well as email. Every participant conducted the survey voluntarily and the responses were anonymised. In general, the data sampling corresponds with the standards and recommendations of Hibberts, Burke Johnson and Hudson (2012).

Once the survey was closed, in order to ensure the quality of the gathered data, a number of adjustments had to be made to the overall sample. Due to age restrictions, three respondents were excluded. Only 73 were considered valid for evaluation, as they finished the complete questionnaire. Responses only by valid IP addresses reduced the sample by another three people, while one more had to be excluded as the person had no experience with shopping online according to their own response. This was necessary in order to ensure a certain level of knowhow about online shopping experiences, processes and payments. These adjustments were based on the assumption that it would not be adequate to survey participants without experience with those related topics. Hence, as a total, these quality ensuring measures resulted in an overall sample size of 69 respondents, permitting adequate input for this study. Table 1 to Table 4 summarise the demographic data of the final data sample.

As can be deduced from that, the majority of the sample participants that are included in the final overall sample, are relatively young, i.e. under the age of 34 (more than 91%), are equally distributed between male or female, originate from Germany, followed second by Portugal, and have a significant monthly spending power for shopping.

3.2 Survey Design and Data Collection

As described above, this research focuses on data collected through a quantitative questionnaire. The actual survey was conducted with Qualtrics and it was created to collect the empirical data necessary to answer the research questions, as based on the theory described above. The structure of the survey is divided into seven sections. The first section contains a brief introduction into the survey and the confirmation question that the participant conducts the survey voluntarily and is older than 18 years. The second section contains single choice questions about demographics such as age, gender, country of birth and monthly income. In the third section, questions regarding online shopping, devices and payment methods used for online shopping, average basket size and the usage of new payment methods at the point-of-sale are asked. The first question of the third section is a conditional question about the usage of online shopping and needs to be answered with yes to continue with the survey. Otherwise, the survey will end automatically. The fourth section contains multiple choice questions about personal perceptions, advantages and disadvantages related to existing state-of-the-art payment technologies and solutions. In the following fifth section, the participants were asked single choice questions regarding their readiness in terms of online shopping and usage of options to design checkout processes more seamlessly and convenient. In addition, the participants had to self-estimate the duration and number of clicks a checkout process would take. The penultimate section contains a scenario with nine steps. The participants were asked to select between the scenario and a conventional well-known payment solution. Preferences were collected with the NPS framework ranging from (0) “not at all likely” to (10) “extremely likely”. Additionally, to

support and analyse the scenario, a matrix table with a 7-point Likert scale ranging from (1) “strongly agree” to (7) “strongly disagree” is used to collect sentiments of eight adjectives related to a payment process during online shopping, such as “convenient”, “seamless” and “frictionless”, to only name three examples. The final section also contains a scenario connected to the one in the previous section. Three scenario-related questions were asked with the NPS framework, each of them ranges from (0) “not at all likely” to (10) “extremely likely”. In general, such a survey design corresponds to seminal guidelines in quantitative research, as eg. described by Nardi (2018) or Namboodiri (2013). Appendices 8.1 provides an overview of the applied survey in total.

3.3 Data Analysis

For the analysis, this study relies on the available analytical toolset provided by Qualtrics. This includes a descriptive visualisation of the responses to each question as well as the application of cross-tables, which will form the core input for the findings chapter below. Such cross-tables or crosstabs in Qualtrics permit to perform multivariate analysis, i.e. the analysis of two or more variables at the same time (cp. Afifi et al. 2019). Hai-Jew (2017, 1 f.) defines the use of crosstabs, also referred to as contingency tables, to capture the frequency distribution of multiple variables and their interrelations. As the author states, this approach permits the “identification of patterns in survey question responses that might well remain latent otherwise” Hai-Jew (2017, 1), consequently, it is going to be utilised here, as far as relevant to this study. One limitation with regard to the crosstabs needs to be noted and taken into consideration when considering the results: Although it was attempted to narrow down the relevant data sample the same way as the descriptive results, Qualtrics did not permit to also exclude the invalid IP addresses, resulting in $n=72$ instead of $n=69$. It is assumed that this difference might not impact the core message of the respective results. Some questions, especially scenario-based ones, utilise the Qualtrics Net Promotor Score (NPS). In that case, the responses are categorised into

three groups, detractors (that are less likely to implement certain measures and require support), passive ones (that do not fall into any clear category), and the promoters that actually apply and literally promote certain measures and advantages of a certain offer.

4 Findings

In the following, the descriptive and more analytical results of the collected data gathered with Qualtrics will be visually presented and summarised. To do so, the available toolset of Qualtrics will be utilised, without specific weighing of any input factors, variables etc. but including a crosstab analysis of relevant data, approaching the main research questions as presented before. Thematically, the questions and respective findings will be structured into issues regarding shopping behaviour, issues regarding the use of checkout and payment technology, the perceived advantages and benefits of innovative payment solutions, details regarding the individual consumer experience and respective consumer behaviour, any general feedback and suggestions, including opinions regarding two-factor authentication. The crosstab analysis will attempt to address these topics more detailed with regard to variables interrelations.

4.1 Shopping Behaviour

Figure 2 to Figure 5 present the data regarding the general shopping behaviour of the respondents. As can be seen there, most online shopping (more than 65%) is conducted at least two to three times a month or even on a weekly basis, hence, it is a common means of shopping for the participants of this study, even though a significant part of them is shopping online less regularly, which should not be overlooked. The majority of online purchases take place on regular laptop or PC and/or a smartphone, with the use of a laptop or PC dominating, as Figure 3 and Table 5 indicate. The use of a tablet is marginal by comparison.

When it comes to the actual payment methods online, well-known alternatives, such as Klarna or PayPal, dominate, next to the use of credit cards, together receiving more than 65%

of the possible multiple responses. Clearly underrepresented are mobile wallets, debit cards or cash payment options on delivery. As Figure 4 shows, for offline shopping in stores, the use of conventional contactless cards dominates with nearly 35%, complemented by mobile payments accounting for almost 19%.

Summing up, the average respondent appears to shop almost on a weekly basis, preferring using their laptop and/or PC to do so, and utilising credit card and/or alternative payment methods (see Figure 5).

4.2 Checkout and Payment Technology

When it comes to the actual payment process and checkout, Figure 6 indicates a basket size between 10 and a 100 Euros for nearly 73% of the respondents; but also larger basket sizes of more than a 100 Euros for more than 26%. It is obvious that online shopping is not a matter for smaller purchases.

Asked about the readiness to use contactless payment technologies for payment wherever available, Figure 7 indicates that there is a significant interest and readiness to do so, with almost 83% responding positively to the prospect. Only a very small percentage of less than 6% of all respondents is unlikely to utilise respective methods.

When asked about possible reasons concerning what might hold one back in doing so, the majority (nearly 43%) indicated too high payment amounts as the main reason (see Figure 8). However, this is closely followed by concerns regarding security (17.6%) and/or the lack of functionality of debit and/or credit cards for contactless payments (16.5%). Although less relevant by comparison, it also needs to be mentioned that many respondents claim to know too little about the functionality and use of this particular payment method in order to use it, which also holds them back to try.

4.3 Advantages and Benefits of Innovative Payment Solutions

Of those respondents using innovative payment solutions, such as mobile wallets etc., convenience (62.3% in total) and time savings (34.6%) appear to be the dominant reasons to do so (see Figure 9). Interestingly, the issue of security comes up too, as 16.3% mention related issues upon checkout, which might be less appealing with conventional methods.

This impression is supported by the data in Figure 10, indicating the main benefits of innovative payment solutions. 48.5% highlight convenience in general, while time savings are relevant for nearly 44% of respondents. Again, further text-based information entered by the respondents include security and privacy issues, such as no need to enter PINs or other personal data and information.

However, innovative payment methods also have disadvantages, although such are mentioned and expressed less (n=84) and thus appear of less relevance compared to the possible advantages. As Figure 11 shows, problems with the actual process, due to the internet connection, authentication etc., but also a general feeling of insecurity during the application of checkout process using such a method (in total making up for nearly 73% of the responses) are perceived as main disadvantages. Additional text-based answers from the respondents also include other issues, though, such as concerns that such payment methods might actually lure the user to spend more money than planned or realised during shopping. Moreover, one response mentioned possible security issues with PayPal due to a lacking money limit and sloppy usage of password security.

4.4 Consumer Experience

Despite the before mentioned concerns expressed by some of the respondents regarding the use of personal data during the checkout process, especially when using innovative payment methods, more than 30% provide personal data to the vendor, although nearly 35% make this dependent on which online store they are shopping at (see Figure 12).

Obviously, the customers do make distinctions here who to trust with personal data, depending on in which shop the purchase takes place. It might be hypothesised that this is depending on the general size and reputation of a specific vendor. Therefore, it also appears less surprising that 58% of all respondents save their credit card credentials in the shop's database (see Figure 13) and even nearly 60% on their respective device (see Figure 14).

While, per se, these numbers are not overwhelming, they support a certain preference for this practice, despite issues and concerns regarding security and data privacy.

Convenience and time savings appear to resurface as main motivators to ignore such issues, as Figure 15, Figure 16 and Figure 17 indicate. Nearly 77% of respondents feel annoyed by entering their payment credentials during checkout, more than 75% spend between one and three minutes or even more during this part of the overall shopping experience; and more than 91% require between 5 to 25 clicks to finish the process.

This might not sound like a lot but in times of required speed and convenience during the online shopping experience, such factors can make a huge difference in actually buying and, even more importantly, becoming a returning customer.

4.5 General Improvements, Feedback and Suggestions

In general, a majority of 71% of respondents would like to apply innovative payment methods (see Figure 18) and a significant group is more than likely to do so too. Following the scenario of an innovative payment method described in question 28 of the questionnaire (see appendix 1), however, the NPS analysis indicates that only 25% would be likely to become promoters of the method, while 41% are actually detractors, which is in sharp contrast to the likelihood to adapt innovative methods as indicated before; and might refer to the indicated complexity of the approach as illustrated in that particular scenario.

Such an assessment is supported also by Figure 19, again underlining the need for a convenient, clear and seamless overall payment process that also provides the required security. Therefore,

it comes with little surprise that nearly 77% of respondents would be interested to use a two-factor authentication during payment (see Figure 20).

It is interesting again to note, however, that according to Qualtrics NPS analysis, 43% would be detractors of such a method and 36% would remain passive (see question 34 in appendix 1). Similarly, 51% would be detractors when it comes to the question whether they would store all their payment details and credentials tokenised and encrypted in an app or phone (see question 31 in appendix 1), while the alternative option of having to enter such data by hand into such an app actually produced very similar results of 48% detractors and 41% remaining passive (see question 35 in appendix 1).

4.6 Crosstabs Analysis

The crosstab function of Qualtrics permits to search for potential interrelations between variables in form of a quasi-multivariate analysis. To do so, the data sample was narrowed down to n=72 relevant responses (see chapter 3 for details).

Similar to the above suggested categorisation of collected responses, it is mainly attempted to link demographic data to more specific questions. Table 6 presents this data with regard to the question how many times the survey participants actually do shop online. As can be seen from this table, the statistical test of significance (pre-set in the software with a p-value less than .05) is only given with regard to place of birth and spending power. According to these results, people born in Germany are more regular online customers than others, as are those with more money to spend. For Table 7, Qualtrics did not calculate p-values. What can be said based on the distributions, though, indicates that younger people are more likely to also use smartphones for shopping, while, in the other categories, the numbers hardly permit any clear differences in usage.

When it comes to payment methods that are used for online shopping, age also plays an important role, as relatively young people are more prone to innovative methods, while older

age groups might be more likely to use credit cards, i.e. methods they might be already more familiar with (see Table 8). Even though the data sample at hand might only provide indications of this, it also appears as if Portuguese respondents are more conservative in their use of payment methods as well, compared to German ones, for example. In all other categories again, a deduction of any clear findings is not possible.

When it comes to checkout and payment technology, demographics in

Table 9 to Table 11 reveal that younger people, similar to the more financially affluent, are more likely to apply new and innovative methods of payment. This needs to be considered even though one finds less favourable p-values in some cases. Consequently, it is not surprising that also younger age cohorts are more positive regarding the potential benefits of innovative payment methods.

An interesting question might be whether shopping basket size or spending power has an impact on the use of a certain payment methods and/or the application of innovative payment methods (see Table 12 and Table 13). Again, as can be seen, besides the relation between spending power and the possible application of innovative payment methods (see Table 14), the p-values do not permit a significant conclusion—as far as Qualtrics provides this data—however, one might interpret the data in a way that smaller basket sizes are more attractive to the usage of more modern payment methods, while a higher spending power specifically results in such behaviour.

When it comes to the relationship between demographics and the storage of credit card data on the shop's webpage and/or own device, Table 15 and Table 16 indicate that relatively older males from Germany have less concerns about this than other respondents, especially with higher spending power.

Interestingly, the usage of a two-factor authentication system during checkout is more interesting to Portuguese females with relatively little spending (see Table 17), again also considering the p-values.

5 Discussion

The previous chapter summarised the findings deducted from a Qualtrics online survey among 100 respondents. Many of the more detailed questions were analysed based on the demographic distribution of the sample but also according to basket sizes, spending power or even the intentions and tendency to accept and use more innovative methods of online payment. In general, it was attempted to structure, organise and visualise the findings according to shopping behaviour, the checkout and payment procedures, the potential advantages and benefits of innovative payment solutions, the consumer experience as well as the possible improvements, especially regarding a two-factor-authentication.

Even though an oversimplification, it can be deducted that especially the young and affluent of the analysed sample have a tendency to use online shopping more regularly and with bigger shopping basket sizes. Including a factor such as spending power for such shopping, all of these appear to have an impact on the interest and application of more innovative payment methods during online shopping. Customers are especially interested in a fast and convenient way to checkout and pay, easily being annoyed by too many clicks or technical difficulties at the end of the shopping experience. At the same time, they are concerned about safety of their payment details and issues of data privacy, although there appears to be little to prevent them from actually storing such sensitive data on webpages and/or devices, especially the more convenience this might be providing to them.

Summing up, it appears rather obvious that for the users of online shopping the final step of the overall shopping experience indeed is very relevant, especially with regards to speed and convenience. They are willing to try new, innovative payment methods, as long as such allow

them to take advantage of an advanced and convenient shopping experience, even at the cost of perceived data security and privacy. As a matter of fact, one could theorise about a potential conflict of ease and convenience on the one hand; and data security and privacy on the other, as especially the above NPS scenario has shown that even more safe two-factor authentication might be too complex to be applied by all, as long as it seems that such methods compromise speed and ease of checking out and pay. Considering the concerns about data and privacy, this appears as a potential contradiction and would provoke the need for further research in the actual motivations and concerns of customers in the future. Nonetheless, it could be hypothesised that easy and convenient shopping, permitting a number of conventional and/or innovative payment methods that are easy to conduct, improves the overall shopping experience and might thus result in returning customers willing to spend more, thus increasing revenues of online vendors.

Despite such findings, there are a number of limitations in this study that need to be mentioned and considered. Although it was attempted to include demographic data in this analysis, the author wants to refrain from drawing a far too simplistic picture about which demographic group behaves in a certain way. The results were rarely strong and clear enough to justify conclusions about, for example, gender and/or place of birth and the relationship between the size of the shopping basket or interest in using innovative payment methods. Moreover, the quantity and quality of the response do not permit to do so in the first place. Consequently, the author focused on relationships that were of immediate interest to the study and appeared to produce some indications as to the main research questions of this thesis. Last but not least, Qualtrics does not permit an in-depth statistical analysis and some of the responses did not even permit to calculate p-values. Thus, it is paramount for the reader of this study to keep such limitations in mind and refer to this research as a potential input for further research

rather than statistical results that would allow the acceptance or rejection of concrete hypotheses.

What does this mean for the research questions stated in the first chapter of this thesis as well as the discussed theory? Regarding the first question, which innovative payment solutions exist and find application in practice, the before mentioned theory and the results of the online questionnaire provide some answers, as indicated above. The question how innovative payment solutions affect the customer experience is mainly addressed by the findings from the questionnaire, although the above mentioned limitations apply. What does remain, as stated as a potential hypothesis above, is the question in what way the customer experience can have an impact on the revenues of an online shop. The following discussion of respective literature, in the context of the already described findings, might help to shed some light on this issue.

5.1 Non-Financial Improvements

As indicated by the findings of this thesis, improving the overall shopping experience might include the use of innovative payment solutions as well as an extensive choice of variety of payment methods in order to anticipate different customer's preferences. Parise, Guinan, and Kafka (2016, 411) called such a requirement a 'crisis of immediacy', i.e. the challenge of how to meet very personalised requirements in online shopping in order to improve the overall experience. Although aimed toward omni-channel retailing channels in general, Shi et al. (2020) underline the role a variety of means to conduct business, including payment and checkout procedures, can have on the shopping experience and thus revenues.

Such an approach has the potential to shift choice and risk management towards the customer, mediating any concerns regarding payment methods and thus resulting in a more likely and convenient checkout and general shopping experience. The general need by vendors to be ahead of the customer needs by offering new methods during the shopping process responding to their needs is also emphasised by authors such as Gellweiler and Krishnamurthi

(2020) or Hoyer et al. (2020, 4), who state that the “customer journey is iterative and dynamic, and includes multiple touchpoints and multiple channels or environments [...]. Key dimensions of an effective customer journey design are the thematic cohesion, consistency, and context sensitivity of touchpoints”, which also include the checkout and payment procedures.

Moreover, the customer data collected especially during successful checkout and actual—repeated—purchases might be extremely valuable for further marketing activities and target marketing (cp. Boyd and Bilegan 2003). The potential relevance of customer data and improving the overall shopping experience, and even revenues, is highlighted by Netessine, Savin, and Xiao (2006), when they consider the challenge of cross-selling in e-commerce. Basically, they focus on two main issues, “(1) how to select packaging complements, and (2) how to price product packages to maximize profits”, thus assuming a direct relationship between collecting and using customer data and improving shopping experience (Netessine, Savin, and Xiao 2006, 893).

5.2 Financial Improvements

Netessine, Savin, and Xiao (2006) also assume a direct link between shopping experience and shop revenues. The above discussed data has also implicated that a positive customer experience facilitated by an easy, fast, reliable and convenient checkout and payment process might indeed have an impact on online shop revenues due to returning business and willingness to spend more in general. In general, the notion of an interrelation between these factors is supported, also by literature discussed before (e.g. Bilgihan et al. 2014; Bilgihan, Kandampully, and Zhang 2016; Mangiaracina, Brugnoli, and Perego 2009). From a more general perspective, not necessarily in e-commerce, Grewal, Levy, and Kumar (2009) are amongst the authors that make it clear that vendors in general need to consider all points of contact with the customer when attempting to improve the overall shopping experience, including the payment process, as this will have an immediate impact on customer satisfaction, the frequency and quantity of

shopping, basket size and thus revenues. Bhattacharya, Srivastava, and Verma (2018, 6) even propose a detailed conceptual model of important interrelations of this phenomenon (Figure 21). While explaining each variable and their interrelations is beyond this chapter, it becomes clear that they also hypothesise a clear interrelation between online customer satisfaction and repurchase intentions, not dissimilar to the work of Pappas et al. (2014).

Last but not least, the issues of adopting new innovative ways of payment and related concerns about risk are also addressed in the works of Wu and Chang (2007), Oliveira et al. (2016) and Kim et al. (2010). While Kim et al. (2010) propose a conceptual model, Oliveira et al. (2016, 404) state that compatibility, performance, social influence and innovativeness influence the adoption of mobile payment technology, while Wu and Chang (2007, 453) prove a positive relation of risk attitude and the online shopping experience, customer satisfaction and the intention to buy again.

Summing up, this literature supports the indications gained from the survey and above detailed findings, although it appears that more concrete research would be necessary to substantiate all claims made and especially to detail the exact interrelationships between relevant variables as well as the exact impact on online shop revenues.

6 Conclusion

As indicated in the discussion chapter of this thesis, the study comes with some limitations regarding data quantity and quality. However, instead of analysing some concrete hypotheses, it is instead the intention to provide the reader with specific indications about the status quo of research in theory and practice in order to develop future research. Consequently, literature as well as own empirical data was applied in order to focus on the relationship of shopping experience and the potential impact of revenues. It was addressed what customers of online shops might be focusing on in terms of shopping behaviour and preferences, especially with regard to checkout and payment procedures and modes; and how these factors might contribute

to financial and non-financial effects. To do so, the empirical data was reflected in context with more theoretical research and critically discussed. Both this study and seminal studies confirm and/or at least support a potential interrelationship of these variables, although the exact extent and quality of such relationships appears to be still undefined.

As a result, this master thesis makes a plea for further research, extending existing conceptual models as well as the existing available database and conducting more statistical analyses on actual hypotheses that might be deducted from this work.

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8 Appendices

8.1 Overview of the applied Qualtrics survey

Innovative Payment Solutions

Start of Block: Default Question Block

Q1 Dear participant,

My name is Caspar Conradt and the purpose of this research study is to understand if innovative payment solutions and processes in online shops are affecting the overall customer experience. Developed as a part of my Management master's thesis at NOVA School of Business and Economics, it aims to gather information about consumers of all age groups and from any part of the world.

Confidentiality and Privacy of Research Data: Your information and responses are anonymous and confidential. It will only be used for academic purposes. Further, no one will have access to your answers except for the Principal Investigators (PI). As such, your supervisor will not know your responses! Therefore, please answer all questions as honestly and accurately as possible.

PLEASE NOTE:

It will really help us if you conduct the survey by giving it your full attention, carefully read all instructions and statements, and then refer to all points accordingly.

To participate in the study, you must be over 18 years old. This survey takes approximately 8 minutes and your participation is voluntary.

In case you have any questions related to the survey, please do not hesitate to contact me

(40636@novasbe.pt)

Thanks in advance for your time and participation! Stay safe and healthy.

Q2 Click to write the question text

- I confirm that I am 18+ years old and participate voluntarily. (1)
 - I do not want to participate or I am not eligible. (2)
-

Page Break

Q5 What is your age?

- 18 - 24 years old (1)
 - 25 - 34 years old (2)
 - 35 - 44 years old (3)
 - 45 - 54 years old (4)
 - Over 55 years old (5)
-

Q6 What is your gender?

- Male (1)
 - Female (2)
 - Other (3)
-

Q7 In which country were you born?

Portugal (1)

Germany (2)

Italy (3)

Spain (4)

Other country: (5) _____

Q8 What is your monthly income to spend? (including alimony, salary, scholarship, etc.)

Below 500€ (1)

500€ - 750€ (2)

750€ - 1000€ (3)

1000€ - 1500€ (4)

1500€ - 2500€ (5)

Above 2500€ (6)

Page Break

Q9 Do you shop online? Or have you ever bought something online?

Yes (1)

No (2)

Skip To: End of Survey If Do you shop online? Or have you ever bought something online? = No

Q10 How often do you shop online?

Every Week (1)

2-3 times a month (2)

Every 2 Months (3)

Quarterly (4)

2-3 times a year (5)

Q11 On which devices do you shop online?

Laptop / PC (1)

Tablet (2)

Smartphone (3)



Q12 If you shop online on more than one device, which percentage would you guess for each of them? Choose percentages that add up to 100%

Laptop / PC : _____ (1)

Tablet : _____ (2)

Smartphone : _____ (3)

Total : _____

Q13 What type of payment do you use for online shopping?

- Credit Card (1)
 - Debit Card (2)
 - Alternative Payment Methods (APMs) (e.g. Klarna, PayPal) (3)
 - Mobile Wallet (e.g. Apple Pay) (4)
 - Invoice (5)
 - Cash on Delivery (6)
 - Others: (7) _____
-

Q14 What is your average basket size per order?

- (1)
- 10-50€ (2)
- 50 – 100€ (3)
- >100€ (4)

Q15 Do you use mobile payments or contactless payments in stores?

- Yes, mobile payments (e.g. Apple Pay) (1)
- Yes, contactless cards (2)
- Both (3)
- Nothing (4)

Q16 Would you use contactless payment technologies (mobile wallets & contactless payments) everywhere it is available?

- Definitely will (1)
- Probably will (2)
- Might or might not (3)
- Probably will not (4)
- Definitely will not (5)

Page Break

Q17 Select the most suitable reasons why you would not use contactless payment technologies (mobile wallets & contactless payments) everywhere it is available?

- Amount too high to pay contactless (1)
 - Don't know enough about it (2)
 - Debit/credit card doesn't work for contactless payments (3)
 - Not sure which debit or credit cards work for contactless payments (4)
 - Worried about security/account being debited incorrectly (5)
 - Never been shown how to use it (6)
-

Q18 What is/are the biggest advantages for you of using APMs/Mobile Wallets?

- Saves time at the checkout (1)
 - Feels more secure at the checkout (2)
 - Makes it easier to pay by debit card/credit card (3)
 - Don't need to remember or use pin/tan (4)
 - More convenient and seamless (5)
-

Q19 What is/are the biggest benefit(s) of using innovative payment solutions?

- Makes it quicker to pay (1)
 - Enables me to buy things on to via my mobile phone (2)
 - More convenient and seamless (3)
 - More payment options (e.g. pay later, installments...) (4)
 - Other (please specify): (5)
-

Q20 What is/are the biggest disadvantages of using innovative payment solutions?

Frequent errors (internet connection, wrong data, 2-factor authentication does not work) (1)

Too complex (2)

Do not know about it and what it actually is (3)

Feeling unsecure (4)

Other (please specify): (5)

Q21 Do you register at online shops and create an account with your personal data?

Normally yes (1)

Sometimes (2)

No, never (3)

Depends which online shop (4)

Q22 Do you save your Credit Card credentials in online shop accounts?

Yes (1)

No (2)

Q23 Do you save your Credit Card credentials on your device?

Yes (1)

No (2)

Q24 Are you annoyed of typing in your payment credentials for every order?

Yes (1)

No (2)

Q25 How long does it take from the decision to buy a product until payment is completed?

Please estimate

- 30 seconds (1)
 - 1 minute (2)
 - 1-3 minutes (3)
 - More than 3 minutes (4)
-

Q26 How many clicks do you think you have to do until you finish the order?

- 5-10 (1)
 - 10-25 (2)
 - 25-40 (3)
 - >40 (4)
-

Q27 Would you be open for new ways of payment at online shops?

Yes (1)

Maybe (2)

No (3)

Page Break

Q28 Would you prefer the following process more than a normal payment with credit card?

Process of payment with 2-factor authorisation:

Scenario: You stored your credentials for payment and shipping adress tokenized on your smartphone with "SmartLogin"

Start your order process on a pc/laptop Website asks you if you want to login with "SmartLogin" You scan a QR Code with your mobile phone and receive a push notification or a sms link Note: You did not enter login credentials before You click on the notification/sms and a pop-up window will open To login you need to confirm with your Face-ID You select your preferred payment type (Apple Pay, saved credit card, pay pal ...) and select your stored shipping address on your smartphone All data will be displayed on your laptop screen to verify and check again You click on buy now and all done You receive a push-notifications and an e-mail with your order confirmation

Duration of this process is approx. 45 seconds without typing in any of your credentials

0 (0)

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (7)

8 (8)

9 (9)

10 (10)



Q29 What adjectives are you mostly connecting to a payment process in your online shopping experience?

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Convenient (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seamless (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clear (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Secure (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frictionless (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intuitive (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customized (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q30 Would you feel more secure with a 2-factor authentication during your payment?

Yes (1)

No (2)

Q33 Scenario: There is a new app which stores all your payment and shipping information on your device but the data is not visible for the merchant due to tokenisation and encryption. You can use it like the app in the 1st scenario for every online purchase. The merchants and financial institutions involved can not collect any data from you.

Q34 Would you use such an application?

0 (0)

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (7)

8 (8)

9 (9)

10 (10)



Q31 Would you store all your payment methods and credentials tokenised and encrypted in an app on your phone?

0 (0)

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (7)

8 (8)

9 (9)

10 (10)

Q35 Would you be more tempted with this app to buy the products in your shopping cart than if you had to type everything in by hand?

0 (0)

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (7)

8 (8)

9 (9)

10 (10)

End of Block: Default Question Block

8.2 Figures

In the following, all figures are by the author of this thesis, unless stated otherwise.

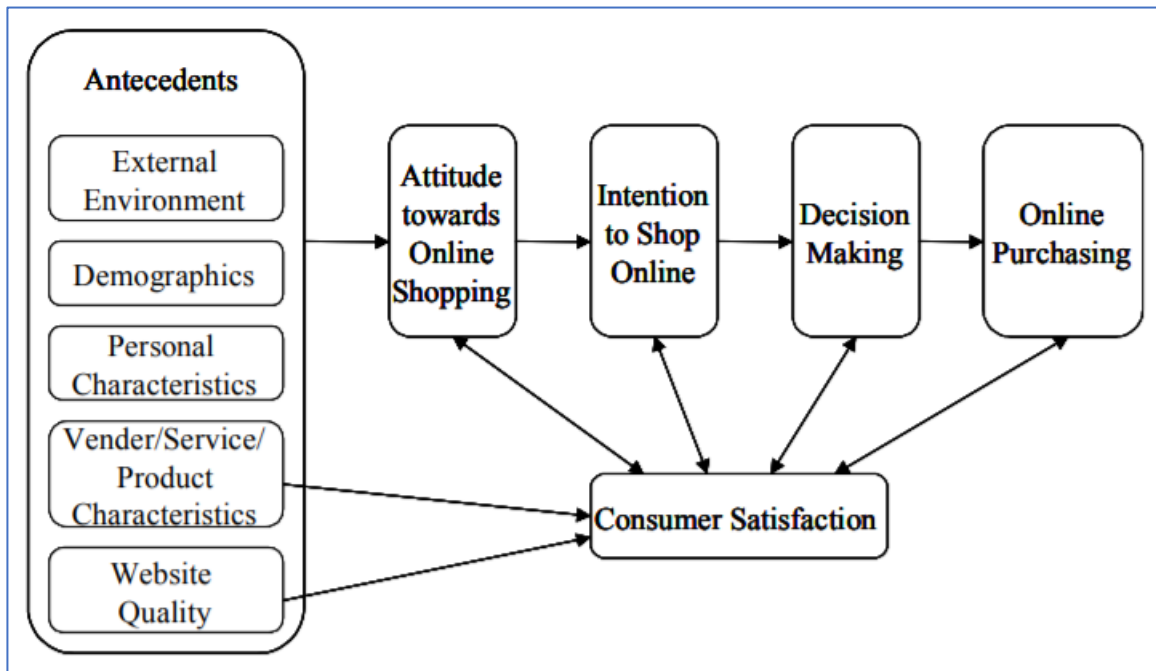


Figure 1: Research Model of Consumers' Online Shopping Attitudes and Behaviour (Li and Zhang 2002, 510).

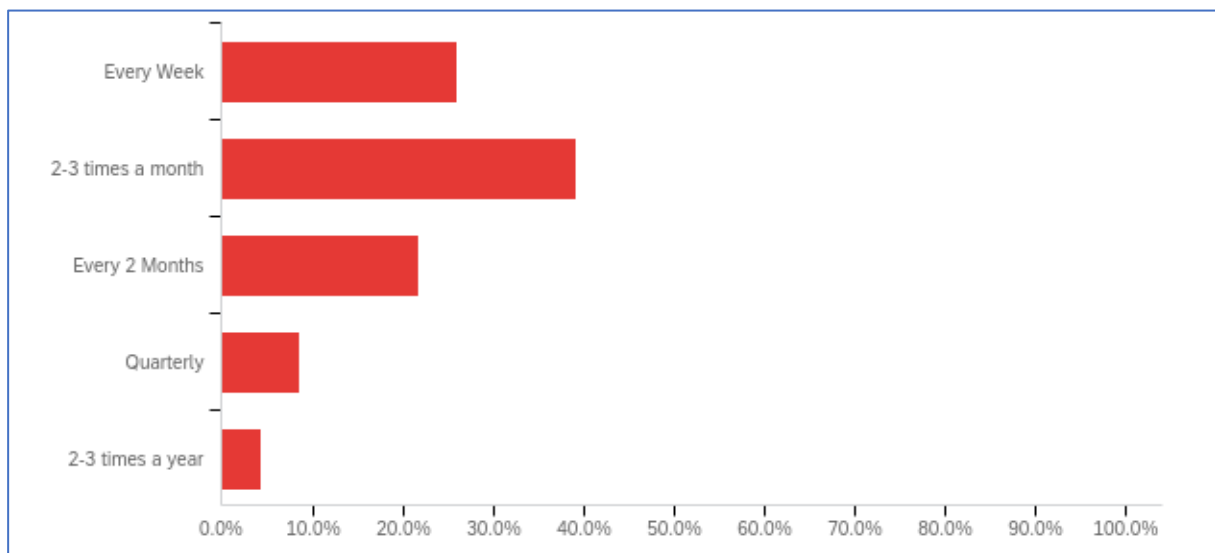


Figure 2: Quantity of Online Shopping (n=69).

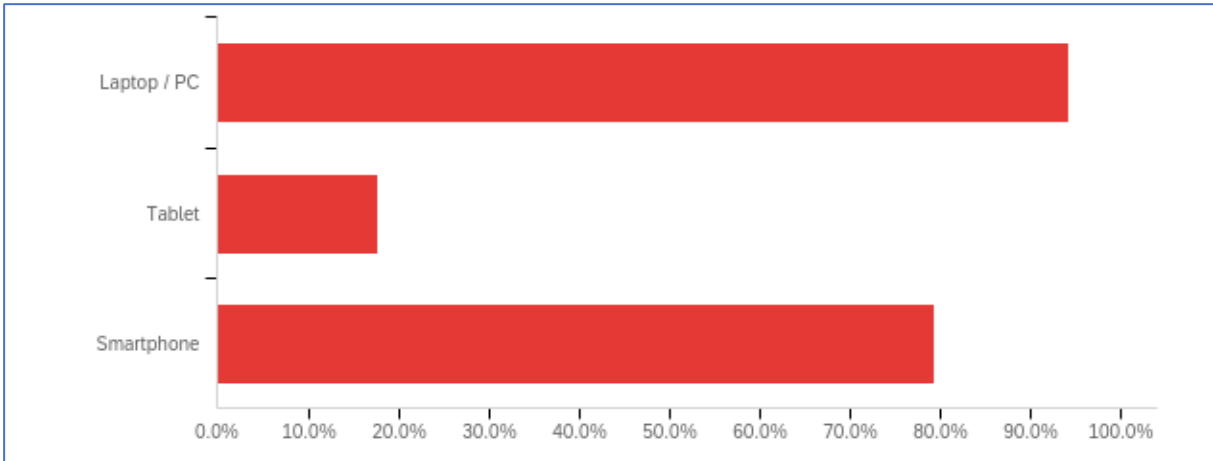


Figure 3: Devices used for online shopping (n=69).

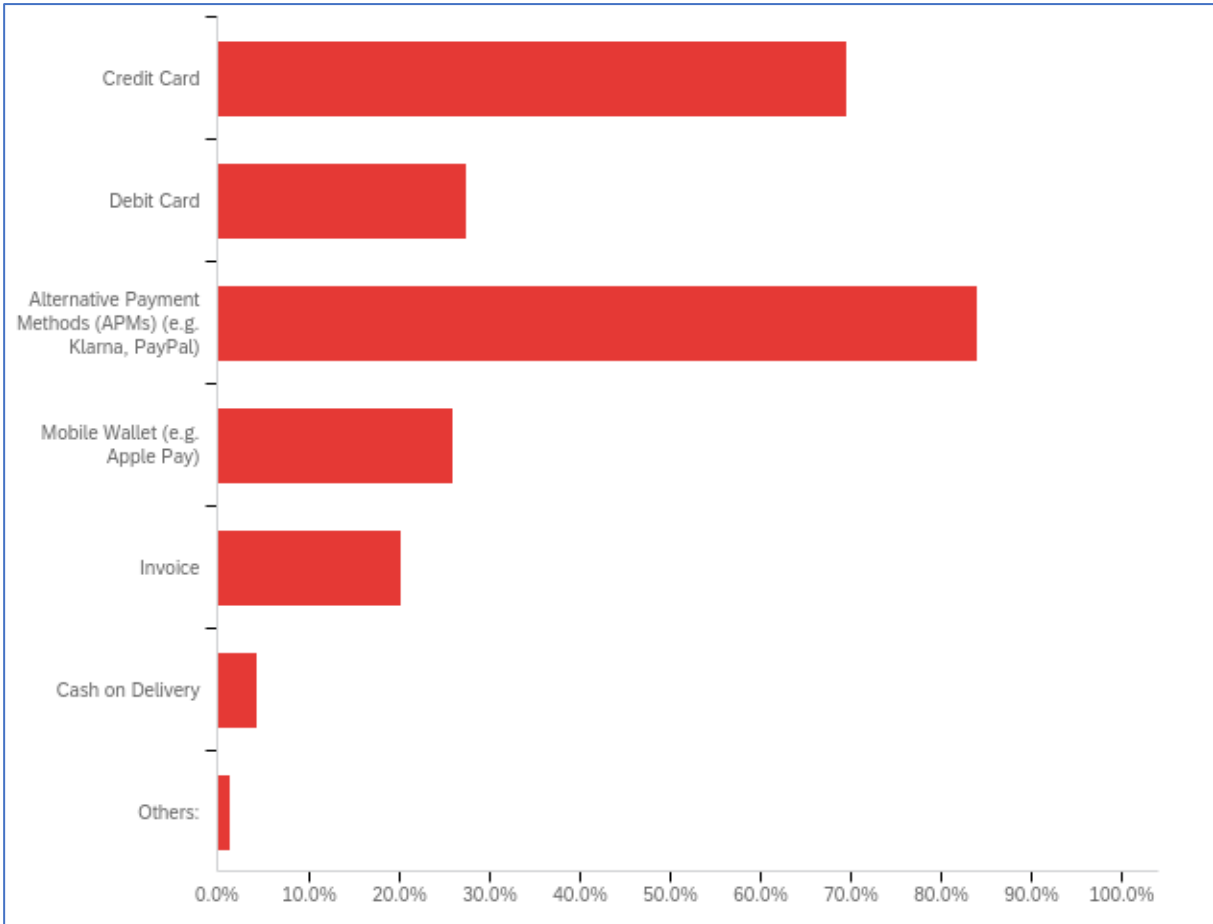


Figure 4: Payment method used for online shopping (n=69).

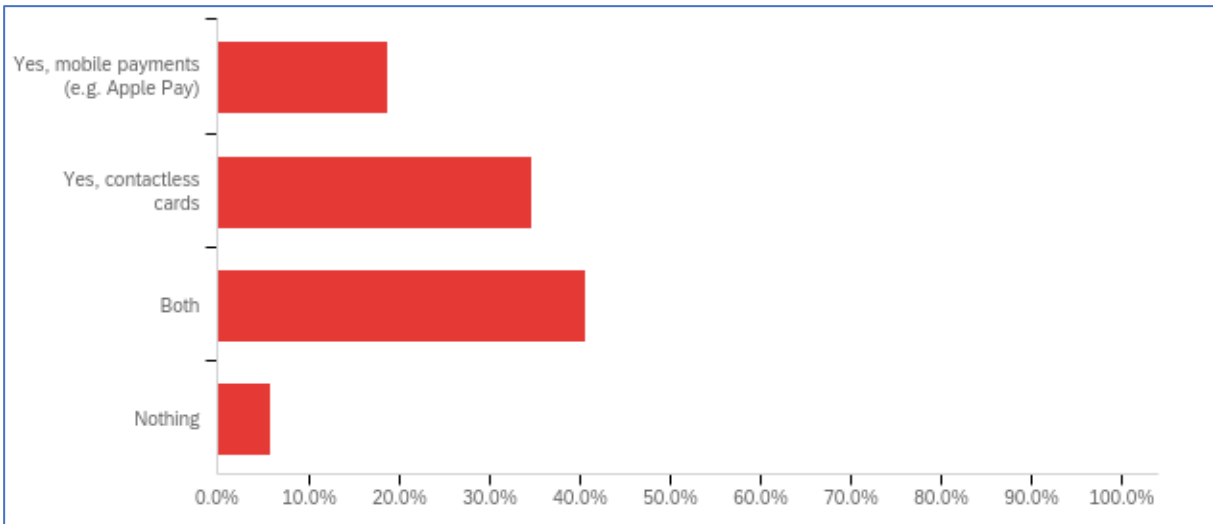


Figure 5: Use of mobile payments or contactless payments in stores (n=69).

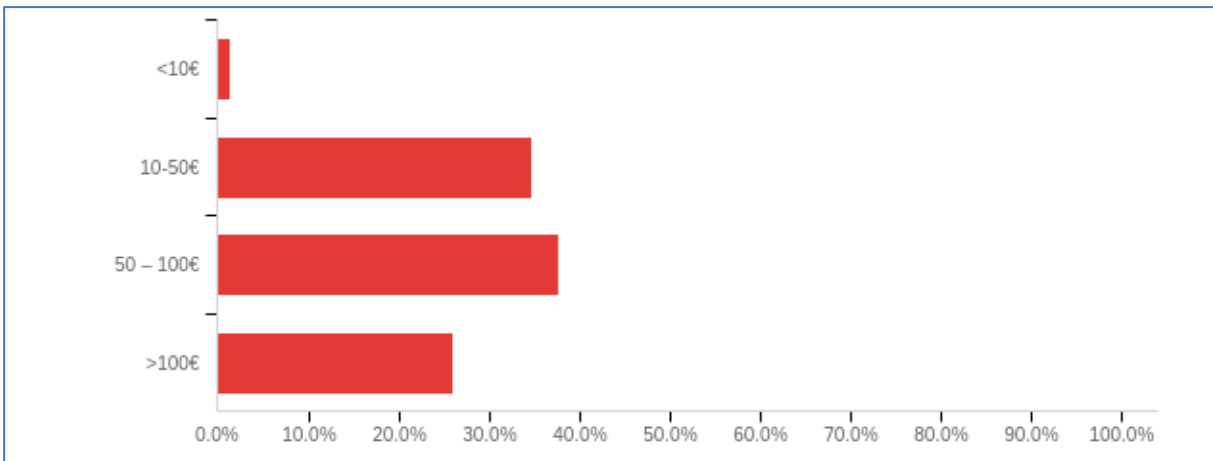


Figure 6: Average basket size per order (n=69).

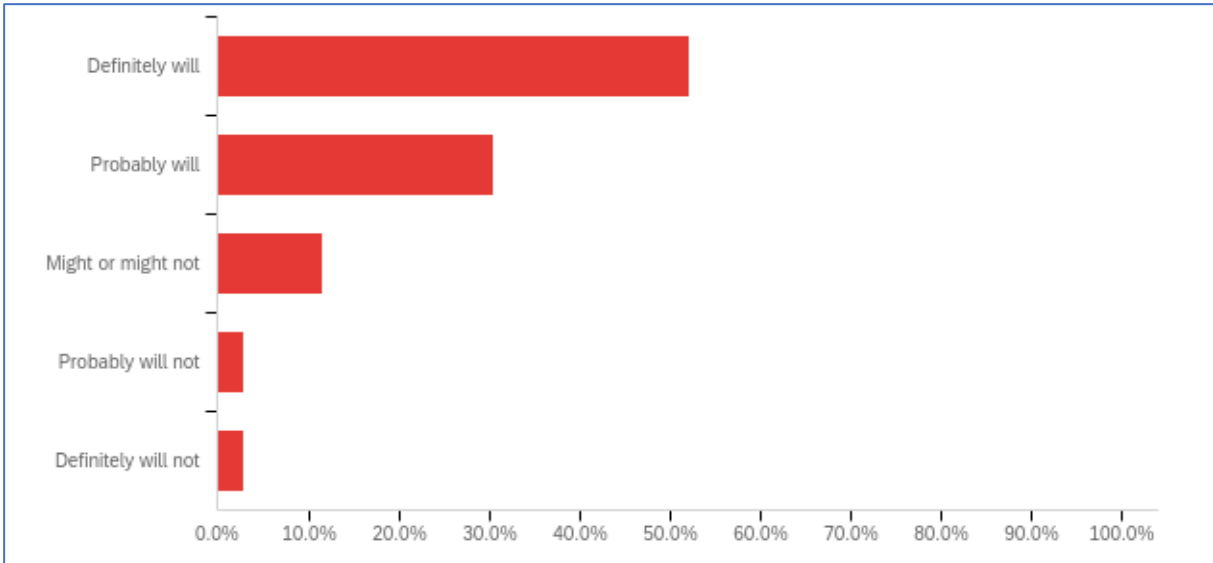


Figure 7: Use contactless payment technologies where available (n=69).

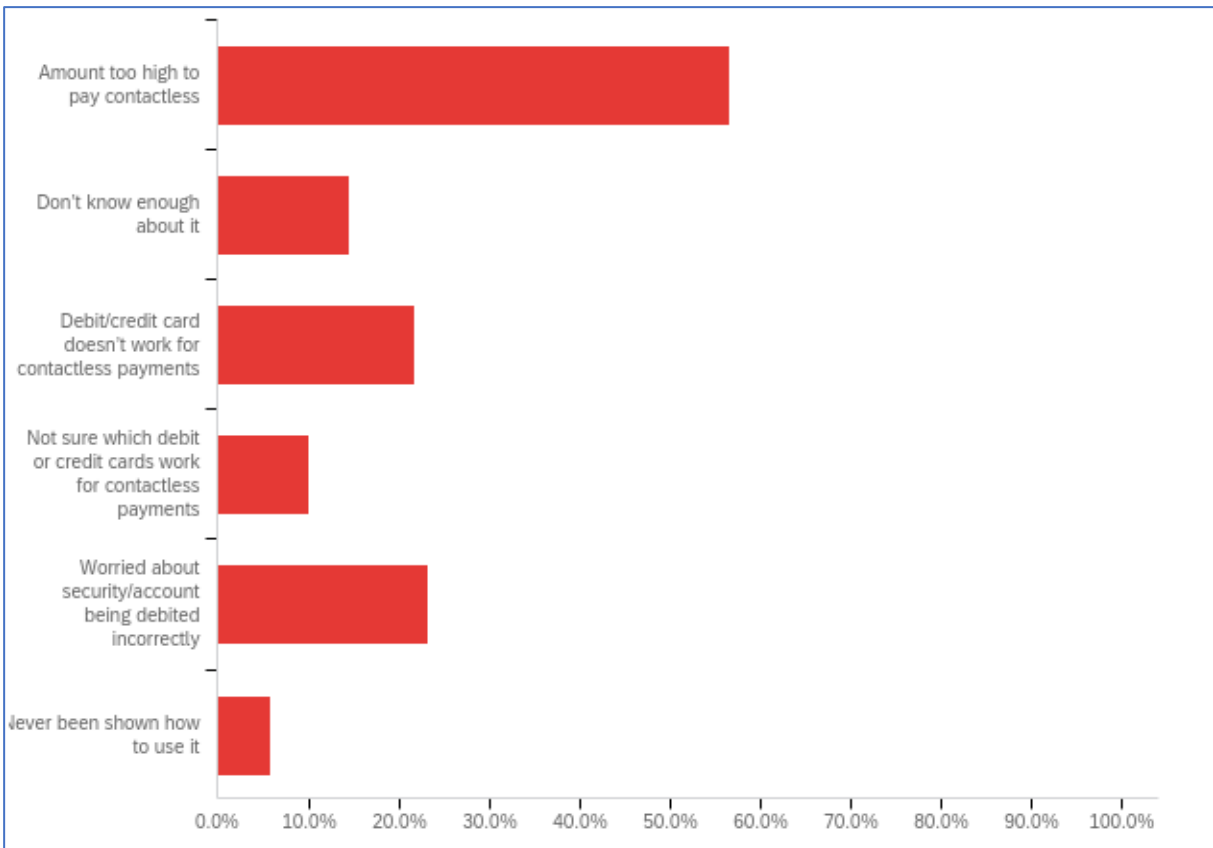


Figure 8: Most suitable reasons for why not to use contactless payment technologies where available (n=91).

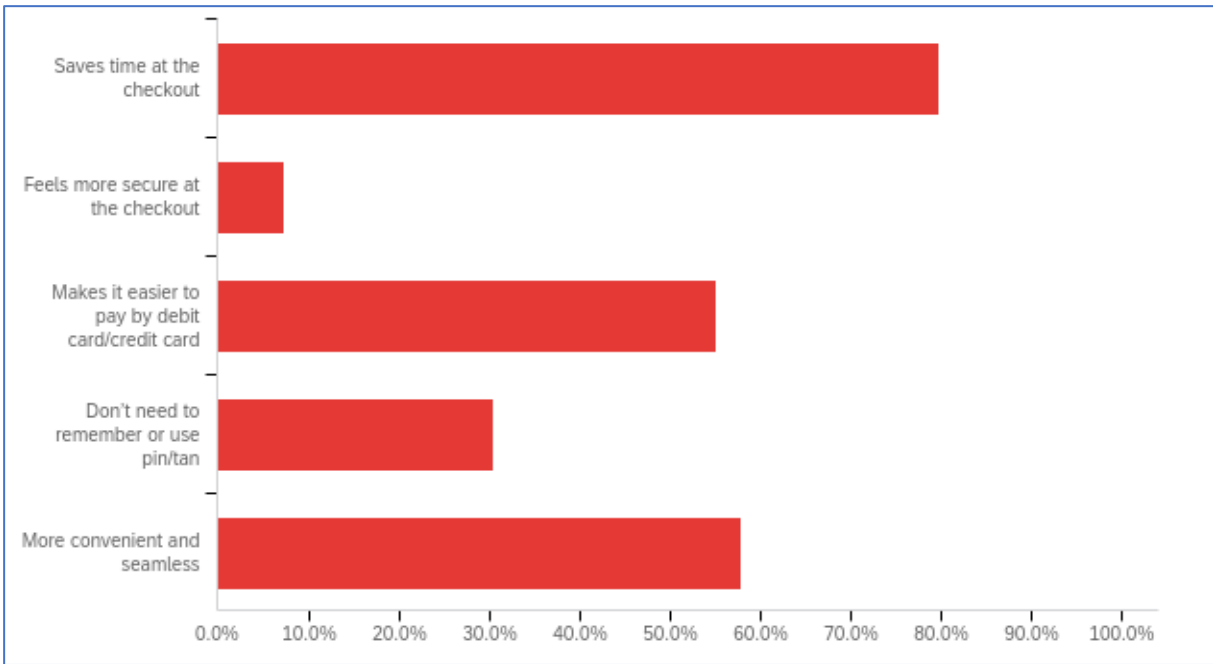


Figure 9: The biggest advantages of using APMs/Mobile Wallets (n=159).

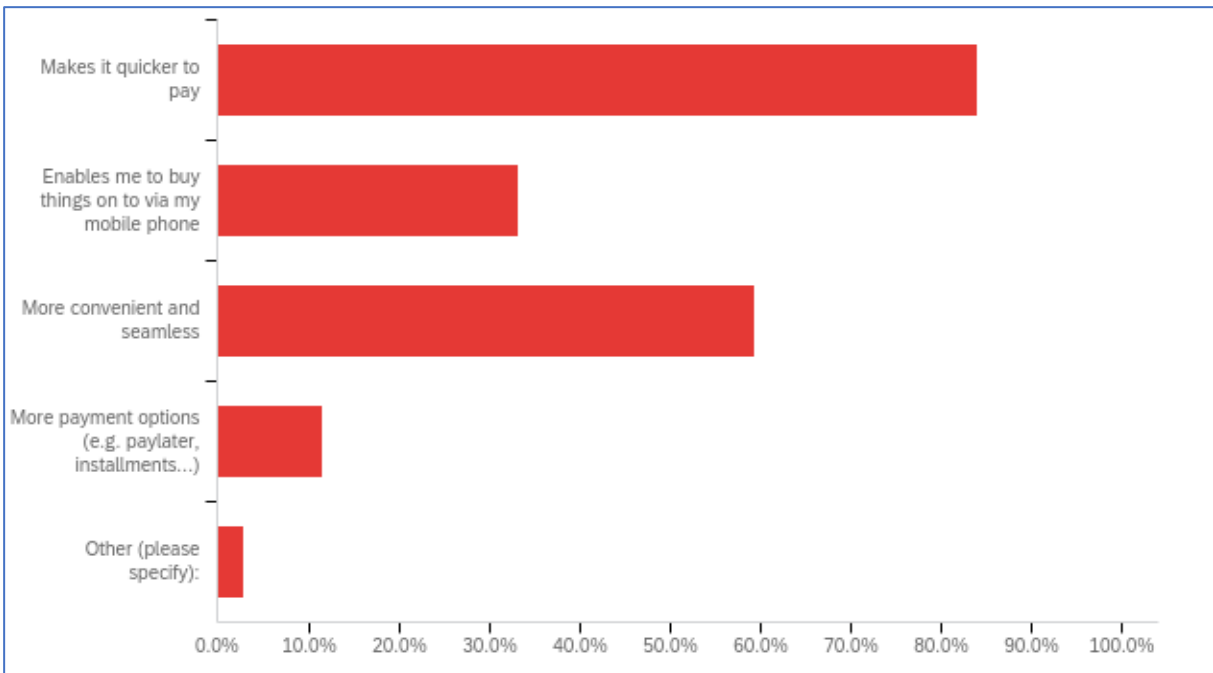


Figure 10: The biggest benefit(s) of using innovative payment solutions (n=132).

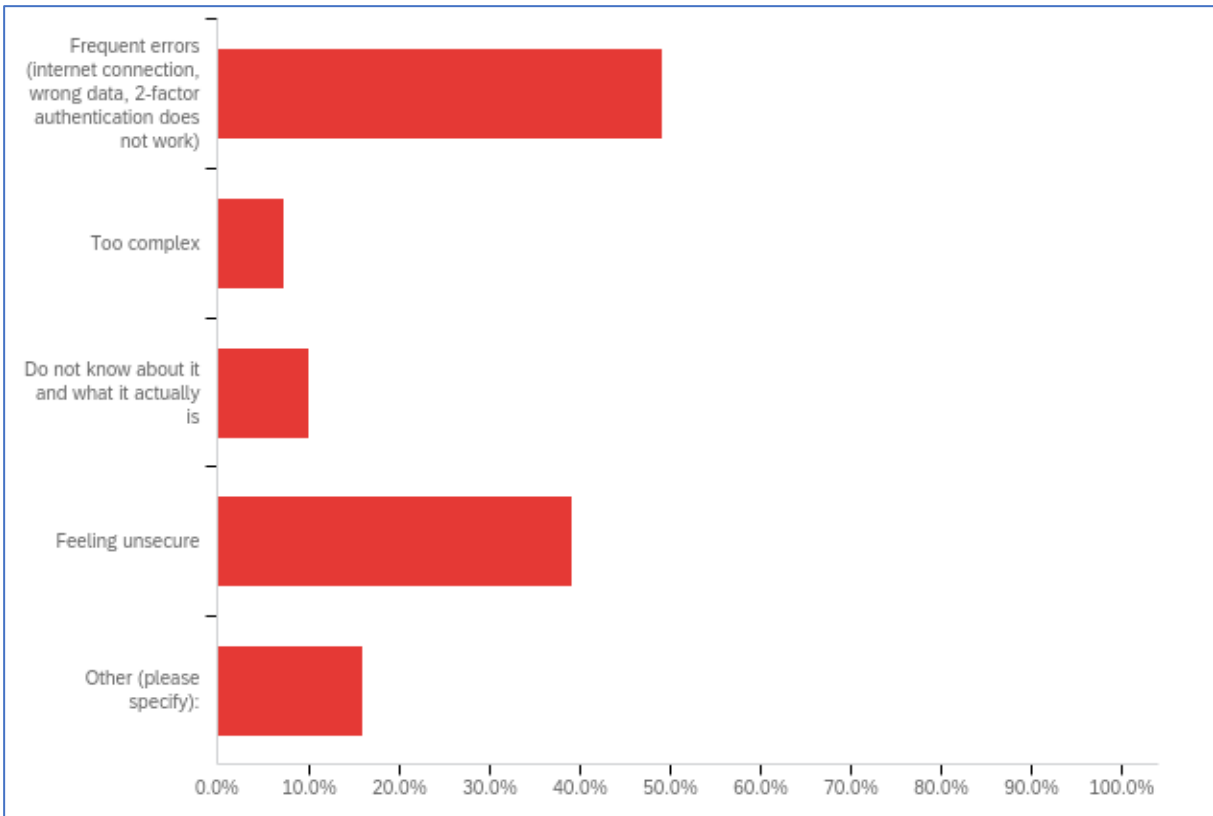


Figure 11: The biggest disadvantages of using innovative payment solutions (n=84).

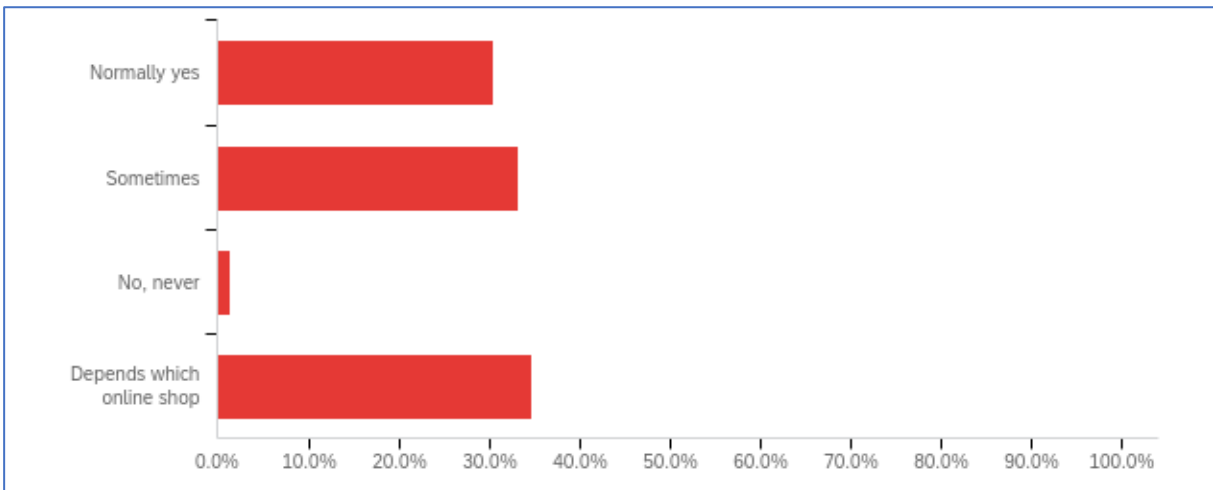


Figure 12: Registering at online shops and creating an account with your personal data (n=69).

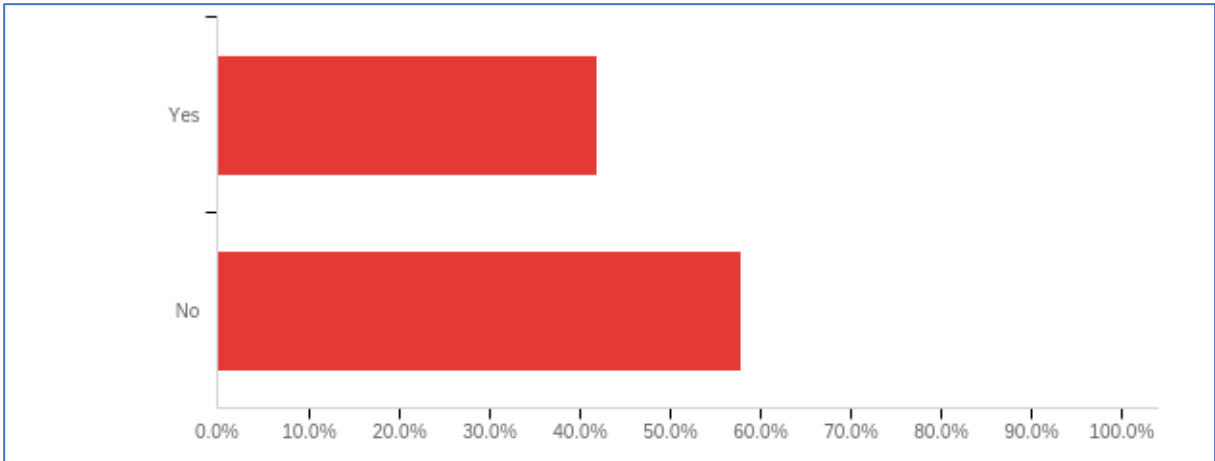


Figure 13: Saving credit card credentials in online shop accounts (n=69).

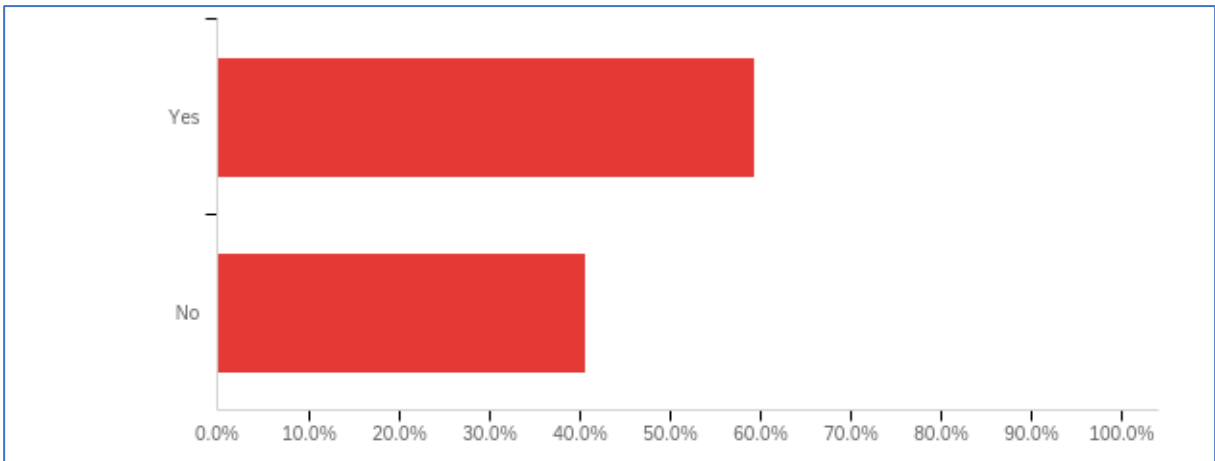


Figure 14: Saving credit card credentials on personal device (n=69).

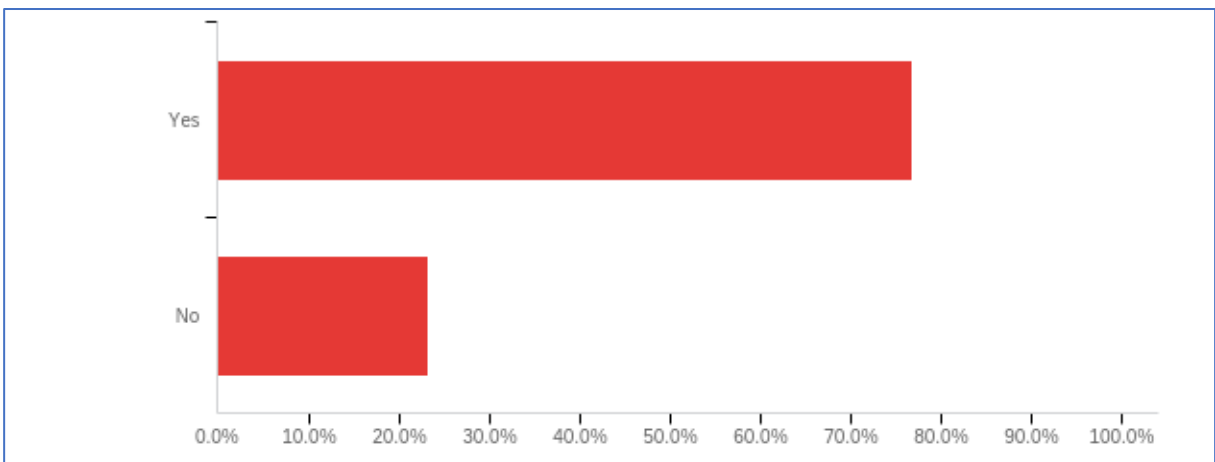


Figure 15: Annoyance of entering payment credentials (n=69).

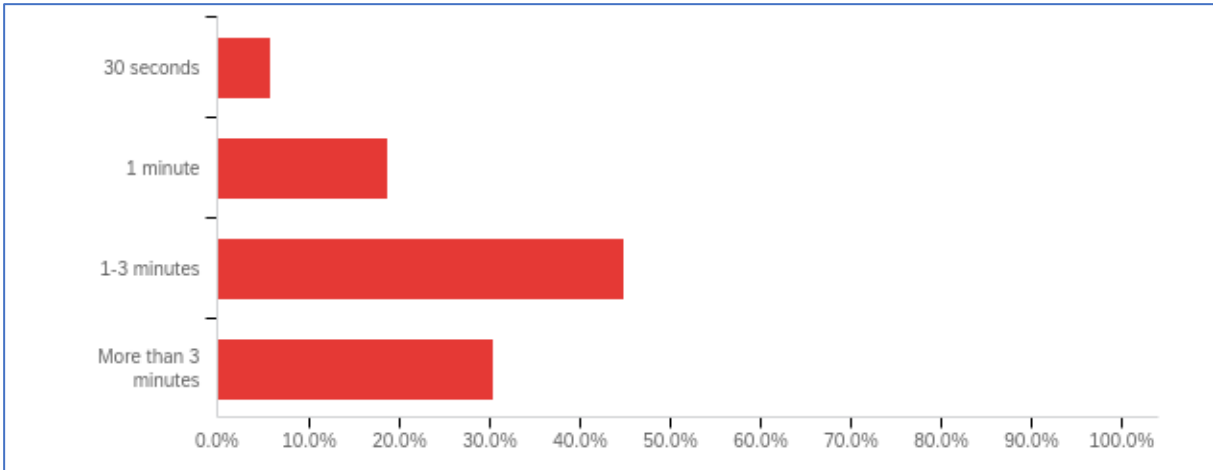


Figure 16: Time from the decision to buy a product until payment is completed (n=69).

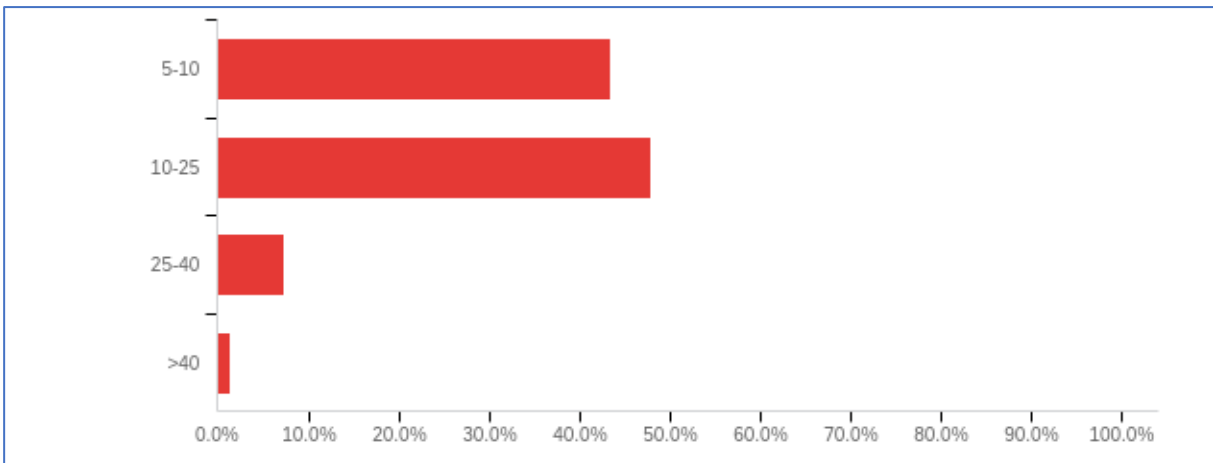


Figure 17: Clicks until concluding the order (n=69).

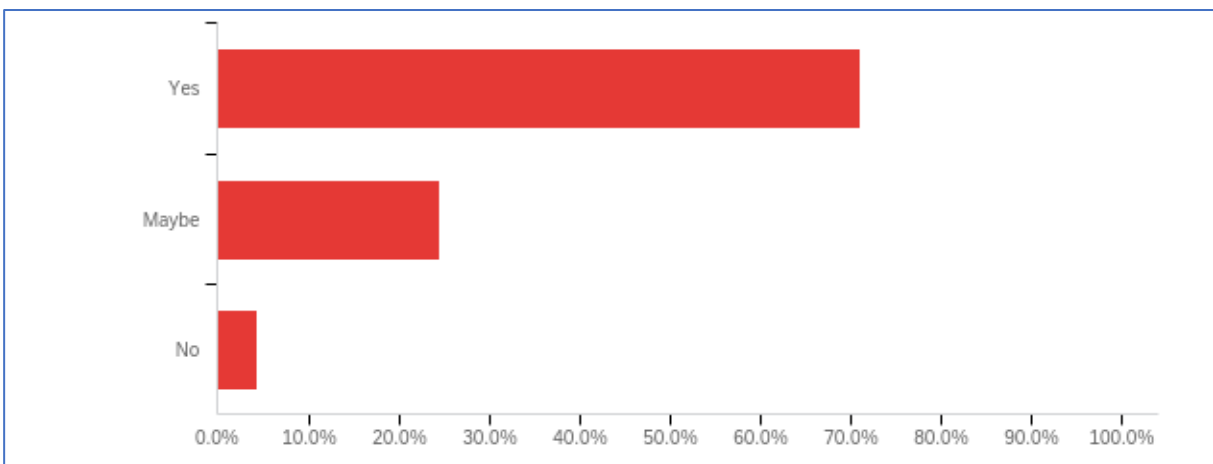


Figure 18: Openness for new ways of payment at online shops (n=69).

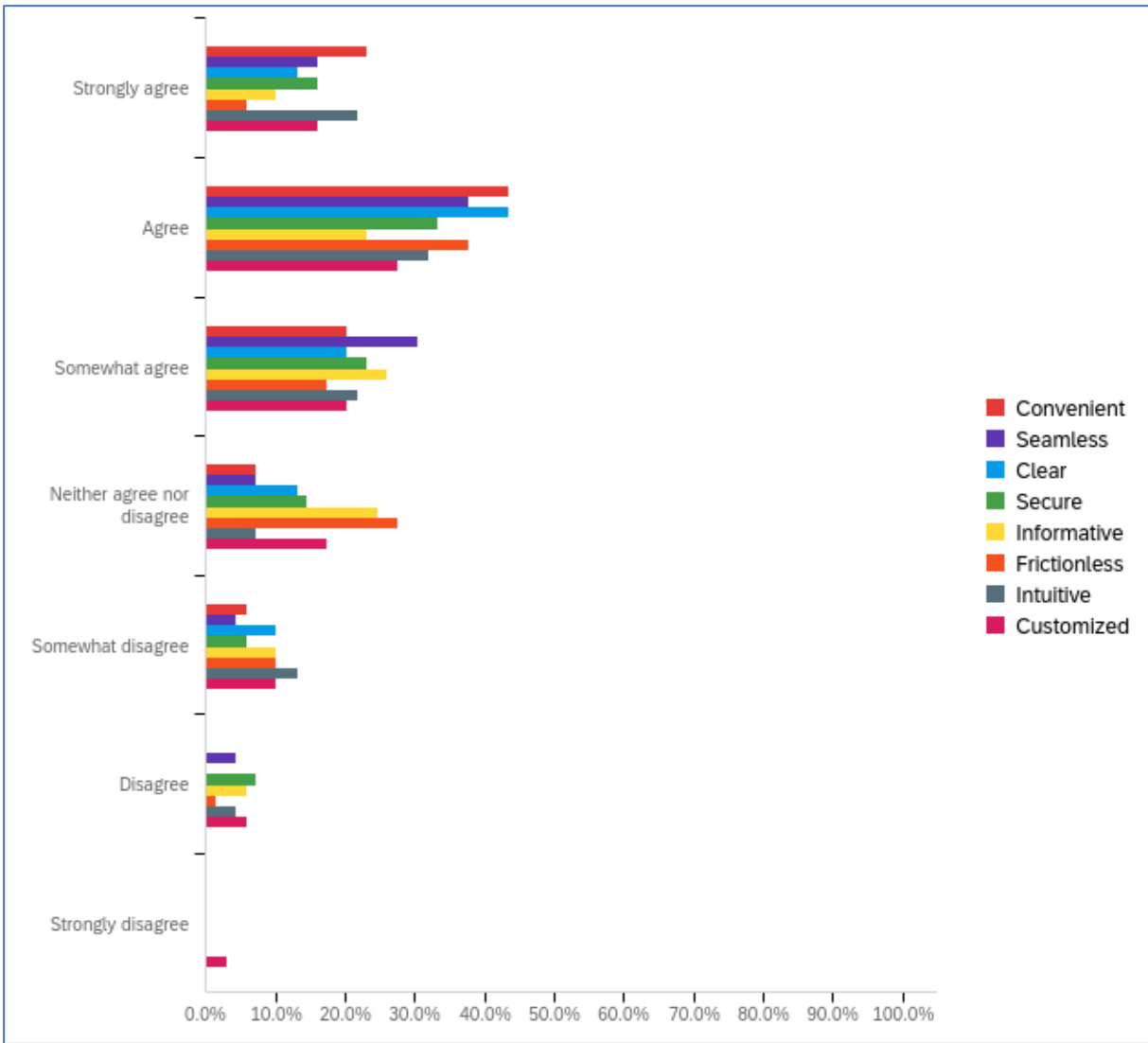


Figure 19: Adjectives mostly connected to a payment process during the online shopping experience (=69).

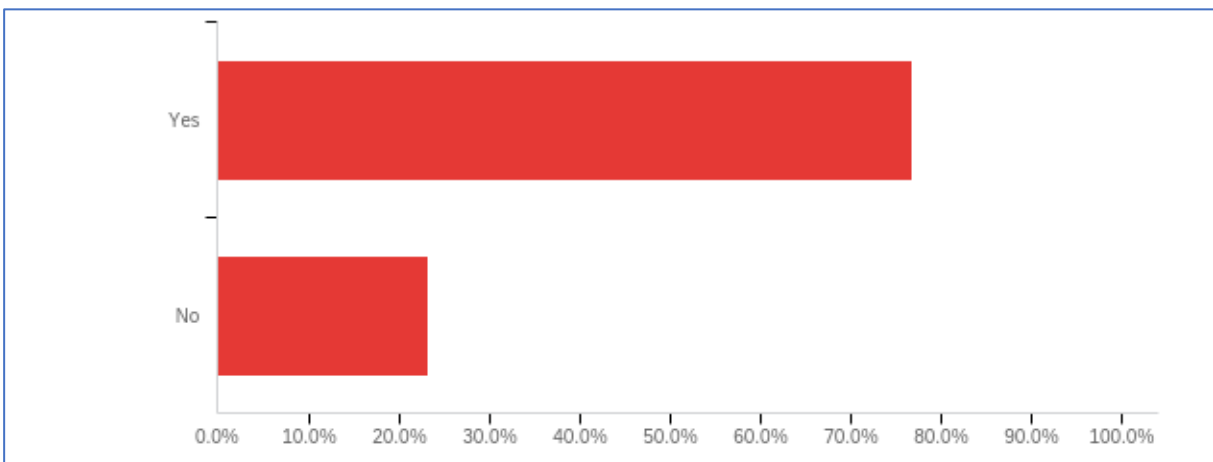


Figure 20: Secure feeling with a 2-factor authentication during payment (n=69).

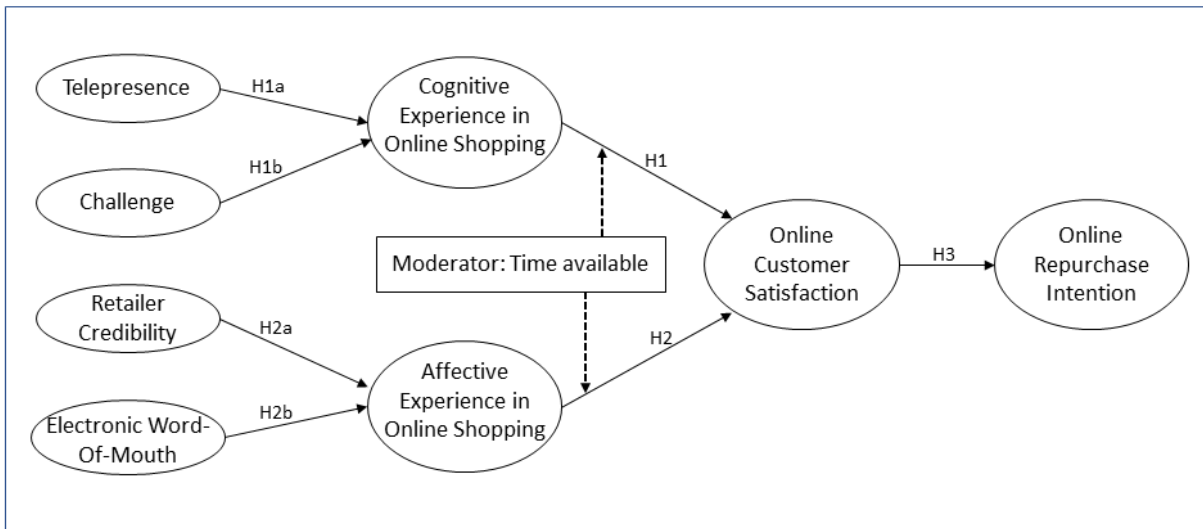


Figure 21: Conceptual model of customer experience in online shopping according to Bhattacharya, Srivastava, and Verma (2018, 6).

8.3 Tables

In the following, all tables are by the author of this thesis, unless stated otherwise.

Table 1: Age Distribution of Sample (n=69).

#	Answer	%	Count
1	18–24 years old	49.28%	34
2	25–34 years old	42.03%	29
3	35–44 years old	1.45%	1
4	45–54 years old	4.35%	3
5	Over 55 years old	2.90%	2
	Total	100%	69

Table 2: Gender Distribution of Sample (n=69).

#	Answer	%	Count
1	Male	49.28%	34
2	Female	50.72%	35
3	Other	0.00%	0
	Total	100%	69

Table 3: Place of Birth Distribution (n=69).

#	Answer	%	Count
1	Portugal	14.49%	10
2	Germany	75.36%	52
3	Italy	0.00%	0
4	Spain	0.00%	0
5	Other countries (including France, Austria, Poland, Singapore, Belgium and China)	10.14%	7
	Total	100%	69

Table 4: Monthly Income for Spending (n=69).

#	Answer	%	Count
1	Below 500€	5.80%	4
2	500€–750€	17.39%	12
3	750€–1000€	17.39%	12
4	1,000€–1,500€	20.29%	14
5	1,500€–2,500€	13.04%	9
6	Above 2,500€	26.09%	18
	Total	100%	69

Table 5: If you use more than one device for online shopping, what is the applied ratio? (n=69).

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Laptop / PC	0.00	100.00	61.39	30.34	920.61	69
2	Tablet	0.00	70.00	3.22	9.77	95.36	69
3	Smartphone	0.00	99.00	35.39	28.08	788.33	69

Table 6: Times of online shopping and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q10: How often do you shop online?	Every Week	26.8%	17.6%	29.0%	100.0%	66.7%	50.0%	26.8%	30.6%	22.9%	0.0%	26.8%	10.0%	31.5%	0.0%	0.0%	14.3%	26.8%	0.0%	16.7%	25.0%	25.0%	33.3%	38.9%
	2-3 times a month	39.4%	41.2%	41.9%	0.0%	33.3%	0.0%	39.4%	36.1%	42.9%	0.0%	39.4%	20.0%	42.6%	0.0%	0.0%	42.9%	39.4%	25.0%	16.7%	25.0%	62.5%	33.3%	50.0%
	Every 2 Months	21.1%	20.6%	22.6%	0.0%	0.0%	50.0%	21.1%	25.0%	17.1%	0.0%	21.1%	10.0%	20.4%	0.0%	0.0%	42.9%	21.1%	0.0%	33.3%	41.7%	12.5%	22.2%	11.1%
	Quarterly	8.5%	11.8%	6.5%	0.0%	0.0%	0.0%	8.5%	5.6%	11.4%	0.0%	8.5%	30.0%	5.6%	0.0%	0.0%	0.0%	8.5%	25.0%	33.3%	8.3%	0.0%	0.0%	0.0%
	2-3 times a year	4.2%	8.8%	0.0%	0.0%	0.0%	0.0%	4.2%	2.8%	5.7%	0.0%	4.2%	30.0%	0.0%	0.0%	0.0%	0.0%	4.2%	50.0%	0.0%	0.0%	0.0%	11.1%	0.0%
	Overall Stat Test of Percentages	0.6999409116212161						0.6984995088305688				0.00020219523530079316						0.0001940930883957396						

Table 7: Type of device used and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q11: On which devices do you shop online?	Laptop / PC	93.0%	94.1%	90.3%	100.0%	100.0%	100.0%	93.0%	86.1%	100.0%	0.0%	93.0%	90.0%	94.4%	0.0%	0.0%	85.7%	93.0%	100.0%	100.0%	100.0%	93.8%	66.7%	94.4%
	Tablet	16.9%	11.8%	25.8%	0.0%	0.0%	0.0%	16.9%	22.2%	11.4%	0.0%	16.9%	20.0%	18.5%	0.0%	0.0%	0.0%	16.9%	0.0%	16.7%	8.3%	18.8%	22.2%	22.2%
	Smartphone	77.5%	70.6%	87.1%	100.0%	66.7%	50.0%	77.5%	77.8%	77.1%	0.0%	77.5%	50.0%	81.5%	0.0%	0.0%	85.7%	77.5%	75.0%	58.3%	100.0%	75.0%	88.9%	72.2%

Table 8: Payment method used and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q13: What type of payment do you use for online shopping? - Selected Choice	Credit Card	69.0%	58.8%	77.4%	100.0%	66.7%	100.0%	69.0%	75.0%	62.9%	0.0%	69.0%	50.0%	70.4%	0.0%	0.0%	85.7%	69.0%	75.0%	58.3%	75.0%	56.3%	55.6%	88.9%
	Debit Card	26.8%	23.5%	35.5%	0.0%	0.0%	0.0%	26.8%	36.1%	17.1%	0.0%	26.8%	40.0%	20.4%	0.0%	0.0%	57.1%	26.8%	0.0%	33.3%	25.0%	31.3%	22.2%	27.8%
	Alternative Payment Methods (APMs) (e.g. Klarna, PayPal)	83.1%	88.2%	80.6%	0.0%	100.0%	50.0%	83.1%	77.8%	88.6%	0.0%	83.1%	80.0%	87.0%	0.0%	0.0%	57.1%	83.1%	75.0%	83.3%	91.7%	87.5%	88.9%	72.2%
	Mobile Wallet (e.g. Apple Pay)	28.2%	23.5%	35.5%	0.0%	33.3%	0.0%	28.2%	33.3%	22.9%	0.0%	28.2%	30.0%	29.6%	0.0%	0.0%	14.3%	28.2%	0.0%	16.7%	8.3%	50.0%	22.2%	38.9%
	Invoice	19.7%	17.6%	19.4%	0.0%	66.7%	0.0%	19.7%	16.7%	22.9%	0.0%	19.7%	10.0%	20.4%	0.0%	0.0%	28.6%	19.7%	0.0%	16.7%	16.7%	25.0%	33.3%	16.7%
	Cash on Delivery	4.2%	5.9%	3.2%	0.0%	0.0%	0.0%	4.2%	2.8%	5.7%	0.0%	4.2%	30.0%	0.0%	0.0%	0.0%	0.0%	4.2%	25.0%	0.0%	8.3%	0.0%	11.1%	0.0%
	Others:	1.4%	2.9%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	2.9%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	14.3%	1.4%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%

Table 9: Tendency towards new payment methods and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q27: Would you be open for new ways of payment at online shops?	Yes	70.4%	64.7%	77.4%	100.0%	66.7%	50.0%	70.4%	66.7%	74.3%	0.0%	70.4%	60.0%	74.1%	0.0%	0.0%	57.1%	70.4%	25.0%	66.7%	100.0%	62.5%	88.9%	61.1%
	Maybe	25.4%	29.4%	22.6%	0.0%	33.3%	0.0%	25.4%	25.0%	25.7%	0.0%	25.4%	30.0%	22.2%	0.0%	0.0%	42.9%	25.4%	75.0%	33.3%	0.0%	37.5%	0.0%	27.8%
	No	4.2%	5.9%	0.0%	0.0%	0.0%	50.0%	4.2%	8.3%	0.0%	0.0%	4.2%	10.0%	3.7%	0.0%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	11.1%	11.1%
	Overall Stat Test of Percentages	0.09910133625436486						0.21583049931235132				0.6107048290227199						0.0420349198288372						

Table 10: The use of contactless payment methods and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q16: Would you use contactless payment technologies (mobile wallets & contactless payments) everywhere it is available?	Definitely will	50.7%	61.8%	45.2%	100.0%	0.0%	0.0%	50.7%	47.2%	54.3%	0.0%	50.7%	40.0%	53.7%	0.0%	0.0%	42.9%	50.7%	25.0%	50.0%	66.7%	68.8%	33.3%	38.9%
	Probably will	32.4%	29.4%	38.7%	0.0%	33.3%	0.0%	32.4%	33.3%	31.4%	0.0%	32.4%	30.0%	31.5%	0.0%	0.0%	42.9%	32.4%	50.0%	41.7%	25.0%	31.3%	33.3%	27.8%
	Might or might not	11.3%	2.9%	12.9%	0.0%	66.7%	50.0%	11.3%	11.1%	11.4%	0.0%	11.3%	10.0%	11.1%	0.0%	0.0%	14.3%	11.3%	0.0%	8.3%	0.0%	0.0%	22.2%	27.8%
	Probably will not	2.8%	2.9%	0.0%	0.0%	0.0%	50.0%	2.8%	5.6%	0.0%	0.0%	2.8%	10.0%	1.9%	0.0%	0.0%	0.0%	2.8%	0.0%	0.0%	0.0%	0.0%	11.1%	5.6%
	Definitely will not	2.8%	2.9%	3.2%	0.0%	0.0%	0.0%	2.8%	2.8%	2.9%	0.0%	2.8%	10.0%	1.9%	0.0%	0.0%	0.0%	2.8%	25.0%	0.0%	8.3%	0.0%	0.0%	0.0%
Overall Stat Test of Percentages		0.0033224431601785427						0.7098570489915482				0.7401529687888386						0.1359480150835716						

Table 11: Perceived benefits of new payment methods and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country were you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q19: What is/are the biggest benefit(s) of using innovative payment solutions? - Selected Choice	Makes it quicker to pay	83.1%	94.1%	77.4%	0.0%	66.7%	50.0%	83.1%	80.6%	85.7%	0.0%	83.1%	90.0%	79.6%	0.0%	0.0%	100.0%	83.1%	100.0%	83.3%	91.7%	81.3%	77.8%	77.8%
	Enables me to buy things on to via my mobile phone	33.8%	35.3%	38.7%	0.0%	0.0%	0.0%	33.8%	44.4%	22.9%	0.0%	33.8%	20.0%	37.0%	0.0%	0.0%	28.6%	33.8%	0.0%	33.3%	41.7%	25.0%	22.2%	50.0%
	More convenient and seamless	59.2%	52.9%	67.7%	100.0%	33.3%	50.0%	59.2%	55.6%	62.9%	0.0%	59.2%	70.0%	57.4%	0.0%	0.0%	57.1%	59.2%	50.0%	58.3%	75.0%	62.5%	44.4%	55.6%
	More payment options (e.g. paylater, installments...)	11.3%	11.8%	12.9%	0.0%	0.0%	0.0%	11.3%	11.1%	11.4%	0.0%	11.3%	30.0%	9.3%	0.0%	0.0%	0.0%	11.3%	25.0%	8.3%	8.3%	12.5%	11.1%	11.1%
	Other (please specify):	2.8%	0.0%	6.5%	0.0%	0.0%	0.0%	2.8%	0.0%	5.7%	0.0%	2.8%	0.0%	1.9%	0.0%	0.0%	14.3%	2.8%	0.0%	0.0%	0.0%	6.3%	11.1%	0.0%

Table 12: Impact of basket size on payment method.

		Q14: What is your average basket size per order?				
		Total	<10€	10-50€	50 – 100€	>100€
Q13: What type of payment do you use for online shopping? - Selected Choice	Credit Card	69.0%	0.0%	61.5%	69.2%	83.3%
	Debit Card	26.8%	0.0%	30.8%	30.8%	16.7%
	Alternative Payment Methods (APMs) (e.g. Klarna, PayPal)	83.1%	100.0%	80.8%	80.8%	88.9%
	Mobile Wallet (e.g. Apple Pay)	28.2%	0.0%	34.6%	19.2%	33.3%
	Invoice	19.7%	0.0%	11.5%	30.8%	16.7%
	Cash on Delivery	4.2%	100.0%	3.8%	3.8%	0.0%
	Others:	1.4%	0.0%	3.8%	0.0%	0.0%

Table 13: Impact of basket size on the application of innovative payment methods.

		Q14: What is your average basket size per order?				
		Total	<10€	10-50€	50 – 100€	>100€
Q27: Would you be open for new ways of payment at online shops?	Yes	70.4%	0.0%	57.7%	88.5%	66.7%
	Maybe	25.4%	100.0%	38.5%	11.5%	22.2%
	No	4.2%	0.0%	3.8%	0.0%	11.1%
	Overall Stat Test of Percentages	0.06909331352954827				

Table 14: Impact of spending power on the application of innovative payment methods.

		Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q27: Would you be open for new ways of payment at online shops?	Yes	70.4%	25.0%	66.7%	100.0%	62.5%	88.9%	61.1%
	Maybe	25.4%	75.0%	33.3%	0.0%	37.5%	0.0%	27.8%
	No	4.2%	0.0%	0.0%	0.0%	0.0%	11.1%	11.1%
	Overall Stat Test of Percentages	0.0420349198288372						

Table 15: Providing credit card data to online shop and store it there.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q22: Do you save your Credit Card credentials in online shop accounts?	Yes	43.7%	29.4%	48.4%	100.0%	100.0%	100.0%	43.7%	55.6%	31.4%	0.0%	43.7%	10.0%	51.9%	0.0%	0.0%	28.6%	43.7%	0.0%	41.7%	41.7%	50.0%	22.2%	61.1%
	No	56.3%	70.6%	51.6%	0.0%	0.0%	0.0%	56.3%	44.4%	68.6%	0.0%	56.3%	90.0%	48.1%	0.0%	0.0%	71.4%	56.3%	100.0%	58.3%	58.3%	50.0%	77.8%	38.9%
	Overall Stat Test of Percentages	0.028540813516135022						0.04043228014710151				0.0346132939749112						0.19859073971348495						

Table 16: Storing credit card data on own device.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q23: Do you save your Credit Card credentials on your device?	Yes	60.6%	50.0%	71.0%	100.0%	66.7%	50.0%	60.6%	77.8%	42.9%	0.0%	60.6%	30.0%	68.5%	0.0%	0.0%	42.9%	60.6%	25.0%	41.7%	66.7%	62.5%	66.7%	72.2%
	No	39.4%	50.0%	29.0%	0.0%	33.3%	50.0%	39.4%	22.2%	57.1%	0.0%	39.4%	70.0%	31.5%	0.0%	0.0%	57.1%	39.4%	75.0%	58.3%	33.3%	37.5%	33.3%	27.8%
	Overall Stat Test of Percentages	0.4359032615129623						0.0026114732044116066				0.043702714682902044						0.3816041760069388						

Table 17: Interest in using two-factor authentication during payment and age group, gender, place of birth and online spending power.

		Q5: What is your age?						Q6: What is your gender?				Q7: In which country are you born? - Selected Choice						Q8: What is your monthly income to spend? (including alimony, salary, scholarship, etc.)						
		Total	18 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	Over 55 years old	Total	Male	Female	Other	Total	Portugal	Germany	Italy	Spain	Other country	Total	Below 500€	500€ - 750€	750€ - 1000€	1000€ - 1500€	1500€ - 2500€	Above 2500€
Q30: Would you feel more secure with a 2-factor authentication during your payment?	Yes	77.5%	85.3%	71.0%	100.0%	100.0%	0.0%	77.5%	72.2%	82.9%	0.0%	77.5%	90.0%	72.2%	0.0%	0.0%	100.0%	77.5%	100.0%	83.3%	83.3%	75.0%	66.7%	72.2%
	No	22.5%	14.7%	29.0%	0.0%	0.0%	100.0%	22.5%	27.8%	17.1%	0.0%	22.5%	10.0%	27.8%	0.0%	0.0%	0.0%	22.5%	0.0%	16.7%	16.7%	25.0%	33.3%	27.8%
	Overall Stat Test of Percentages	0.040730001499102275						0.28359522013711036				0.150569074496311						0.7648057434031673						