Critical Success Factors for the Implementation of the No-Line-Concept in the Context of the Austrian Consumer Electronics Sector

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Abstract. This paper explores critical success factors for the implementation of the No-Line-concept set in the context of the Austrian consumer electronics retail sector. The factors Multi-Channel Integration Service Quality (MCISQ) and Mobile Service Quality (M-S-QUAL), which both had already been tested earlier, were incorporated into a combined research model aiming to integrate different perspectives of No-Line. Based on a questionnaire completed by 105 Multi-Channel-experienced customers of an Austrian consumer electronics retail store, factors were investigated upon their influence on customer loyalty. Through a PLS path model, we found that MCISQ and M-S-QUAL together account for 44.8% of the variance in customer loyalty, and that 22.7% and 52.9%, respectively, have a significant influence on this dependent variable. Concluding it seems that today's customers are mostly ready for No-Line-Commerce and that the concept is generally feasible.

Keywords: No-Line-Commerce, Multi-Channel-Integration, Customer Loyalty, Multi-Channel Integration Service Quality, Mobile Service Quality

1 Introduction

Based on a market survey conducted by SME Research Austria, the Austrian stationary retail marked realized some EUR 66.3 billion in 2015, which represents a nominal sales development of + 1,1% compared to the preceding year [1]. Within the same period, the revenues of Austrian internet retailers nominally rose by + 7% (i.e. up to EUR 3.3 billion), accounting for approximately 5% of Austria's total retail volume in 2015. Within the last decade, Austria's share of online buyers skyrocketed, moving from 1.8 million in 2006 to 3.7 million in 2013. Today, approx. 57% of all Austrian citizens aged between 16 and 74 years have already been purchasing goods online [2].

With an average stake of 22%, the consumer electronics sector is prominently present in all three forms of distribution markets; i.e. bricks & clicks, clicks & sheets, and internet-pure-players. Consequently, it qualifies as a valid stratum to investigate a potential change in the industry [3]; one where the so-called No-Line concept may play

Multikonferenz Wirtschaftsinformatik 2018,
March 06-09, 2018, Lüneburg, Germany

a major role. According to today's predictions [4], the 8% average growth rate in sales seen with European online retailers will lead to an overall online share of 30% by 2020. In addition, approximately 20% of all in-store purchases will be either "online-induced" or "online-accompanied". This development entails the growing importance of Multi-Channel Marketing and Multi-Channel-Management so as to ensure that a customer's "cross-channel free riding behavior" does not lead to a loss in customer loyalty [5]. In order to provide flexibility as well as independence from business hours or store locations, retailers increasingly seek to gradually integrate their distribution channels. No-Line, the Multi-Channel concept which requires the highest level of channel integration [6], aims at providing a consistent customer experience across channels. That is, it should feel as if buying from one and the same entity, no matter how individuals combine different channels throughout the buying process. An adequate, customer-oriented implementation and operation process, which integrates Multi-Channel Integration Service Quality (MCISQ) as well as Mobile Service Quality (M-S-QUAL), may thus be seen as a critical success factor for this concept.

2 Relevant Theories and Research on the Evolution of Multi-Channel and the Success Factors of No-Line

2.1 Multi-Channel-Evolution

The Multi-Channel concept has been developed as part of the retail marketing landscape [7]. Formerly known as Multiple-Channel, it is mainly characterized by two or more uncoordinated but coexisting distribution channels [8, 9]. Cross-Channel as well as Omni-Channel represent more advanced levels of the Multi-Channel concept and are primarily targeting the customer's desire to use different channels in combination (i.e. they support "channel-hopping") and his/her increased information requirements [10] (although this development is varying among different product categories [11]). While in general Omni-Channeling is defined by a more integrated linkage of all customer contact points [3] and the aim to optimize the customer experience and revenue across all channels [12], it is ultimately characterized by the transition from a sequential customer journey to a parallelization of activities [13, 14]. Omni-Channeling therefore serves as a fundamental requirement to move to the so-called No-Line concept, which aims at maximizing the channel integration [15]. Such is driven by an increased mobile device usage (e.g. Smartphones and/or other portable smart devices [6]) and thus by a greater mix in buying process stages (both chronological and location-wise) [16].

2.2 Changes in the Customer Process

No-Line-Commerce highlights apparent changes happening to the buying process due to the Internet and its extensions. In particular, the disengagement of the Point of Decision and the Point of Sales [17], the consequent adaptation of stores and distribution channels into showrooms [6, 18], and the imperative demand for a sound

balance between "channel cannibalization" and "cross-channel free riding behavior" is what increasingly defines customer loyalty. As integration and mergence are primarily caused by harmonization (which is inevitably necessary so as to define a retailer´s No-Line readiness [6, 19]), van Baal found that a rise in such leads to a higher cross-channel customer retention, which also outpaces the simultaneously increasing cannibalization effects [20]. We might thus conclude that a better coordination of a retailer's different channels also increases customer loyalty and cross-selling opportunities, and may consequently lead to a growth in sales. Although, the strength of this effect is extenuated with firms that have a strong focus on one specific channel [21].

Building on these rather generic implications, Emrich et al. focused their attention on the relation of channel structures and compared them to assortment structures. In doing this, they found that a complete integration of a retailer's channels is only beneficial if their assortment relation is substitutive or complementary. Yet, it is rather inferior for independent assortments, typical for department stores [22]. This behavior is based on the lack of competence customers attribute to this retailer type [23] and furthermore demonstrates that a customer's product evaluation efforts are limited by physical as well as by cognitive search costs [24], making channel and assortment coordination a crucial part of No-Line commerce.

Building on these findings, the goal of our research was to harmonize and integrate perspectives. As a basis we used Heinemann's 7M Success Factors in No-Line Commerce [6] whose core is constructed around the four dimensions of Multi-Channel Integration Service Quality (MCISQ) [25], and the four dimensions of Mobile Service Quality for Physical Products (M-S-QUAL) [26]. As for a test region, we focused on the Austrian consumer electronics sector, where we distributed a model-driven questionnaire survey to explore relevant No-Line success factors from a customer's point of view.

3 Methodology

3.1 Measurement of Variables

Multi-Channel Integration Service Quality (MCISQ): MCISQ was measured via the four dimensions of Multi-Channel integration quality proposed by Sousa & Voss [25]. Their study concluded that Multi-Channel quality consists of two main dimensions, namely the channel-service configuration and the integration of interactions. Channel integration, in particular, was found to affect a customer's service quality perception and not just influence the intersection of his/her perceived in-store and online service quality. Such also implicates that this type of integration acts as a key quality component, which should be implemented using a customer-centric service design so as to overcome potential organizational barriers of grown Multi-Channel retailers. For more information on the resulting 14 questionnaire items which are further categorized within four dimensions, i.e. breadth of channel choice, transparency of channel service configuration, content consistency, and process consistency, please refer to the revised Multi-Channel integration service scale of Wu & Chang [27].

Mobile Service Quality (M-S-QUAL): M-S-QUAL is a measurement tool that specifically addresses smartphones and other ubiquitously available mobile devices as the key cross-technology platform for the development of No-Line-Commerce [28]. It considers mobile service quality an essential part of a customer's overall perceived service quality [26]. Analogous to Service Quality (SERVQUAL) [29, 30] and Electronic Service Quality (E-S-QUAL) [31], Huang et al. developed this model for measuring the service quality of physical and virtual product purchases, of which we incorporated the four physical product purchase dimensions, i.e. efficiency, fulfillment, contact, and responsiveness, adding up to a total of 15 items. The conclusions from Huang et al. explicitly add value to our work as they explain that businesses should rely on standardized mobile purchase processes (particularly with physical products) so as to not keep customers from buying mobile due to differences in given transaction processes (like it is the case for virtual products purchases). These findings are in line with those of Gao et al., who note that mobile customers expect the purchase process to be fast and to require little effort while displaying only up-to date and relevant information [32]. Additionally, they note that the traditional concept of service quality needs to be redefined in a commerce environment increasingly characterized by mobility, and that M-S-QUAL is the first framework which explicitly recognizes the differences between mobile purchases of physical and virtual mobile product [26].

Customer Loyalty: Generally defined by the framework of Dick & Basu [33], and then further specified towards the requirements of Multi-Channel commerce by Wallace et al. [8], customer loyalty was measured with the same three questions used in the work of Qi [34] that, for their part, are based on the results of studies on Multi-Channel loyalty intention by Lee & Kim [35] and Oliver [36].

3.2 Delimitation and Stimuli

In order to guarantee the credibility and comparability of results the product-group specific focus was set on the consumer electronics sector. This choice was further motivated by previous research showing that the share of people described as Multi-Channel enthusiasts is high in this field [37] and that the sector is known for its high Multi-Channel efforts [16]. Therefore, the questionnaire survey was distributed to customers of an Austrian consumer electronics store who had just completed a ROPO-purchase process. They received a printed information letter alongside their invoice when picking up their online ordered product in store. This procedure ensured that all participants were to some extend Multi-Channel-experienced, which we may derive from their awareness for certain advantages of that type of buying process, e.g. the benefit that the offline channel adds to an online transaction and vice versa [24]. These customers were also more likely to be interested in expressing their opinions, as our questions might have covered some of their pre-purchase considerations.

The survey consisting of 35 question items (14 MCISQ items + 15 M-S-QUAL items + 3 LOYAL items + 3 demographic items) was accessible either through a QR-code or through a link, both depicted directly on the printed information letter. All questioner

items were adopted from previously published research (cf. Section 3.1), yet translated to German so as to fit the target group (note: translation-back-translation procedure was applied [38]). Seven-point Likert scales were employed in order to ensure comparability to former studies (cf. [27, 34]).

3.3 Research Hypotheses and Model

Pre-stage demographic Hypotheses: Our general assumption was that improvements in service quality have a positive influence on customer loyalty [39, 40], which is why we determined MCISQ and M-S-QUAL as independent variables and customer loyalty (LOYAL) as dependent variable. In addition, we assumed an impact of the three demographic segmentation variables age, education and welfare as proposed by Konus et al. [24], who analyzed various studies regarding the effect of demographics on Multi-Channel commerce.

Research Model: In order to evaluate the above described assumptions we used a Partial Least Squares Structural Equation Model assembled with SmartPLS V3. This allowed for the analysis of a potential relationship between MCISQ and M-S-QUAL, looked at from a customer's point of view and expressed by their respective influence on LOYAL. The main hypotheses to evaluate were:

H1: MCISQ has a positive impact on customer loyalty
H2: M-S-QUAL has a positive impact on customer loyalty
H3: MCISQ correlates with M-S-QUAL

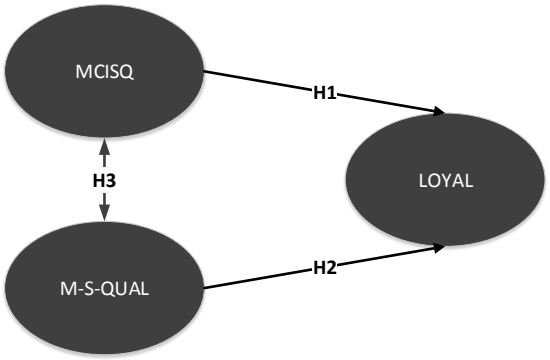

Figure 1. Research Model of Hypotheses H1-H3

4 Results

4.1 Demographic Impact

Based on the design of the study we had to rely on the experience of previous research in the field of Multi-Channel and electronic goods regarding the composition of the participants. The sample was collected over one month (March 2017), generating 105 valid record sets (123 total responses). To test for significance we used an ANOVA. Normal distribution and reliability were tested following the suggested approach by Brown [41]. Both Variables proved eligible (MCISQ $\overline{x}$ = 4.85; s = 0.86; Asymp.Sig. (2side) = 0.19; C.A. = 0.85 and M-S-QUAL $\overline{x}$ = 5.31; s = 0.69; Asymp.Sig. (2side) = 0.2; C.A. = 0.86), with only the disposable income showing a significant impact on M-S-QUAL: F(4/100) = 3.117; p = 0.018. **Table 1** illustrates the allocation of all those demographic variables, which were identified as having a significant impact on the evaluation of MCISQ in previous studies, and their corresponding values in our study.

Table 1. Impact of demographic variables

Variable	Allocation[1] (%)					Impact on	Impact on
	1	2	3	4	5	MCISQ	M-S-QUAL
Age	8.6	58.1	13.3	10.5	9.5	NS	NS
Education	5.7	26.7	61.9	5.7		NS	NS
Disposable Income	6.7	13.3	21.9	23.8	34.3	NS	+/-

4.2 Partial Least Squares – Structural Equation Model

Reliability and validity of the data for the PLS-SEM analysis was ensured by testing skewness and kurtosis for non-normal distribution, and EFA and CFA for multiple item constructs [42, 43]. The MOBFULL_2 loading (0.537) proved to be below 0.6 but was kept in the sample to enable further comparison and recognize possible translation issues (although the removal slightly increased the composite reliability).

As shown in **Table 2**, the traditional desired Cronbach´s Alpha of 0.7 [44] was not reached by all variables, however Hair et al. [45] suggest a Composite Reliability of at least 0.6 and a desired value of 0.7 to 0.9 [46] for PLS modeling. The MOBFULL AVE was below the recommended value of 0.5 [47] but was accepted in order to treat it similar to the way MOBFULL_2 was treated.

[1] Variable Characteristics:
Age (15-20; 21-30; 31-40; 41-50; 50+)
Education (Pflichtschulabschluss; Lehrabschluss/BMS; Matura/Berufsreife; Universitätsabschluss/Meisterprüfung)
Disponable Income € (-50; 50-150; 150-350; 350-700; 700+)

Table 2. Construct Reliability and Validity

Latent Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
BREADTH	0.762	0.864	0.679
CONCONS	0.734	0.833	0.555
CONTACT	0.696	0.831	0.622
LOYAL	0.699	0.829	0.621
MOBEFF	0.808	0.868	0.571
MOBFULL	0.638	0.785	0.483
PROCONS	0.722	0.827	0.546
REACTION	0.798	0.882	0.714
TRANS	0.765	0.864	0.680

The discriminant validation did not pass all requirements defined for the pairing correlation of 0.7 [48] and was also lower than the AVE of the corresponding factor [47]. This only occurred in combination with the 2nd order variables MCISQ and M-S-QUAL and can thus be justified by the difficulty of assessing 2nd order variable models [49].

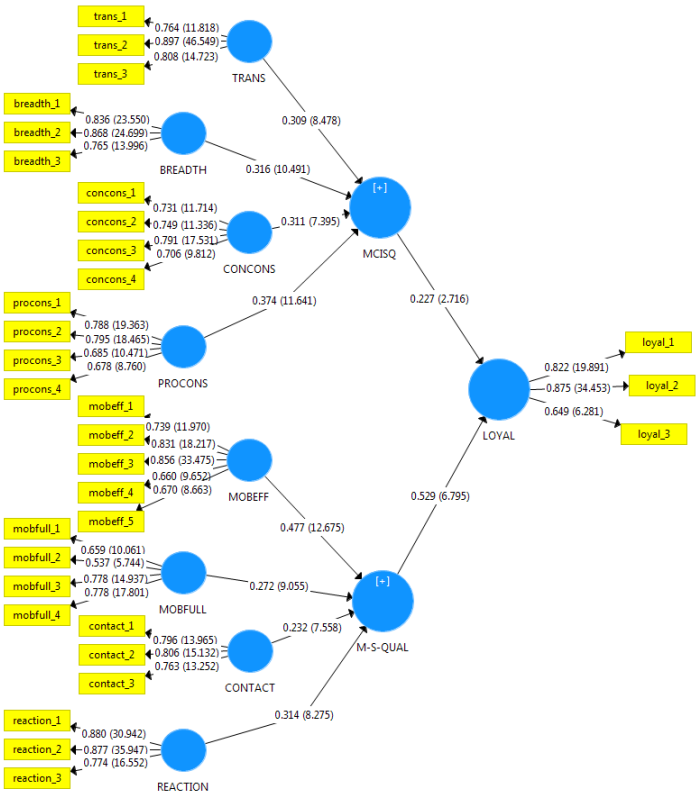

Figure 2. PLS-SEM Model

To measure the predictive quality of the model we used the Q (LOYAL = 0,246, M-S-QUAL = 0,316, MCISQ = 0,321), as recent research has proven that the Goodness-of-fit Index (GoF) is inapt to distinguish valid from invalid PLS-SEM models [50].

Figure 2 shows the calculated PLS - SEM using Smart PLS V3 [51]. We used two tailed Bias-Corrected and Accelerated Bootstrapping (complete) with 5000 subsamples, no Sign Changes and a significance level of 0.05. The outer model displays the weights/loadings with t-values in brackets, the inner model the path coefficients and t-values. Showing a t-value > 1.96 for all path coefficients, we may assume significance on the specified level, with most of the weights exceeding the 0.001 threshold. Multi-Channel Integration Service Quality (MCISQ – 0,227) and Mobile Service Quality (M-S-QUAL – 0,529) both have a significant impact on Customer Loyalty and explain 44,8% of its variance.

The relationship between MCISQ and M-S-QUAL shows a significant medium correlation on the aggregate level ($r = 0,499$, $p < 0,01$) and we also see a significant strong correlation on the dimensional level, namely between CONCON and MOBFULL ($r = 0,525$, $p < 0,01$) and MOBFULL and MOBEFF ($r = 0,554$, $p < 0,01$).

5 Discussion

The continuous shift towards online and especially mobile shopping on the one hand and the increasing competition between former pure brick & mortar and today's online players on the other hand, forces market competitors to adopt customer preferences. This market evolution is best observable in a technology-driven environment, with many innovators and early adopters, like the consumer electronics market.

Previous studies centered on Multi- or Omni-Channel were focused on the company perspective and showed that the benefits of homogenous channel management surmounts its losses, effectively becoming one, if not the recommended driver for online success. From a customer perspective, especially for innovators and early adopters, multi-channel shopping transforms from a delighter to a basic need [52, 53] , which could be one of the reasons for the lower than expected importance of the MCISQ, particularly considering that all participants had recently completed a Multi-Channel buying process. As we have no data on how often the participants use a mobile device in general, and especially whether they use it to perform a buying process or parts of it (either at the reseller we studied or at a competitor), we cannot compare the impact of the participant's experience.

However, our results let us conclude that after reaching an acceptable level of Multi-Channel service integration users tend to focus on the actual channels (although such may require an additional investigation of companies having similar results for M-S-QUAL but offering less homogeneous channels). The correlation between mobile order processing and mobile efficiency seems reasonable, as the ordering process is part of the consumer buying process, which in our case was entirely supported by a mobile solution. The correlation between Consistency across Channels (CONCON) and Mobile Fulfillment (MOBFULL) indicates that people who trust the consistency across

channels are more likely to buy mobile because they avoid another evaluation phase due to channel inequalities like price segmentation or warranty and support issues.

Excluding MOBFULL_2 from the model (loading 0.537), as considered earlier, leads to a slightly higher reliability (Cronbach's Alpha 0.662; Composite Reliability 0.814; AVE 0.595). As a result, the path coefficients shift away from the corresponding factor (CONTACT +0.011; MOBEFF +0.024; MOBFULL -0.027; REACTION -0.002) with a non-significant impact on the predictive quality (M-S-QUAL R 0.995; LOYAL R 0.449).

To investigate the significant impact the disposable income may have on the mobile service quality and the entire construct, we analyzed the groups regarding M-S-QUAL and reduced the groups from five to three. Such was necessary to fulfill the PLS-SEM eligible group sizes [42], which was not given by the groups with very low (-50€, N = 7) and low (50–150€, N = 14) disposable monthly income. Except for the first group the values show a positive correlation and in combination with the group composition we merged the first three groups, resulting in low, medium and high disposable income (0-350€, N = 44; 350-700€, N = 25; 700+ N = 36). **Table 3** shows that with increased disposable income, the impact of mobile service quality declines and the channel integration becomes more important, yet the model predicts less of the variance.

Table 3. PLS-SEM Results grouped by disposable income

Measured Construct	0-350 €	350-700 €	700+ €	Aggregate
M-S-QUAL -> LOYAL	0.595	0.524	0.415	0.529
MCISQ -> LOYAL	0.225	0.244	0.299	0.227
LOYAL R	0.518	0.459	0.388	0.448

6 Conclusion and Further Research

The strong influence of mobile service quality requires additional investigations with respect to the No-Line concept. Mobile technology in combination with (location based) targeted advertising has the power to obliterate the borders of channels, especially reducing the length of the buying process and therefore increasing the conversion rate. The social transformation towards being always available and only having time "in-between" further nourishes mobile interaction. In this context the influence of the product category (convenience vs. shopping goods [22]) should be considered in detail, as mobile devices are very well able to complete a buying process but still lack the comfort more traditional buying processes offer in terms of search and evaluation. Consequently, we expect an even stronger influence on loyalty from mobile service quality in combination with convenience goods.

Further research could also focus on the integration of emerging technologies (channels) and their integration into the No-Line concept, like Virtual & Augmented reality. While initial studies in this field were conducted years ago [54], the topic becomes increasingly more popular today, as more VR and AR devices hit the consumer market.

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