Don't Forget Consumer Value – Investigating Consumer Attitudes toward QR-codes

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Abstract

In a transforming retail sector, digitization has boosted innovation and new self-service technologies within stores all over the world. However, innovations within retailing are seldom successful if they are not built on true consumer value. This paper investigates consumer attitudes toward using mobile devices in a retail setting, with specific focus on QR-codes and how they might deliver customer value. The data consists of 150 in-store surveys conducted at two different Swedish retailers. The results of the empirical material show significant differences between age groups with regard to how they value QR-codes but also indicates what would make consumers actually use one. While the consumer group of 40-years old and upward stated they would pick up their mobile phone and scan the QR-code if given a discount, the younger group (up to 40 years old) did not place value on a discount but would scan a QR-code if there was entertainment value in doing so. Except for these differences, the material also reveals low consumer knowledge of QR-codes and that the actual use of them is low. These results, in light of the increased attention from retailers in using mobile devices to communicate with consumers, as well as investment in other digital aids to increase profits, show discrepancies in the perceived value of digital aids on the part of the retailer and the value experienced by the consumer. It is of outmost importance, therefore, to remember consumer value when managing innovations within the retail context.

Keywords: QR-codes, consumer value, innovation, digitization

1. Introduction

Shifts in technology and consumer behavior often compel retailers to increase the innovation stakes. As the retail sector is currently undergoing a transformation in terms of digitalization, retail executives are adapting their brick-and-mortar stores to introduce technology, and together with service performance, deliver better customer value. The use of mobile devices to communicate with consumers has become a strategy to, for example, support consumer relationships and it is important, not only to view the retail aspects, for instance investment decisions regarding mobile communication, but also the value of this to the consumer. The smart phone era characterizes the contemporary retail sector and consumer behavior and mobile devices offer retailers a great opportunity to develop new innovations. Information communication technologies (ICT) used in retail settings are beginning to focus on services that help shoppers plan their shopping trip, often in terms of mobile apps and interactive dialogue services (Retail Week, 2014; Ström, Vendel & Bredican, 2014). However, given that technology investments can exceed millions of dollars, and that the margins and inventory productivity of many retailers' have been eroded over the last ten years, the stakes for information technology decisions have grown exponen-

tially. Therefore, care must be taken when making these decisions in order to avoid so-called profit destroying innovation (Chopra & Baldegger, 2014).

There are many battles to be won within the retail sector and how to manage innovations is one of them. Sometimes, "old technology" with potential might be an alternative to incremental new operations and might trigger innovation and efficiency. An easy and affordable alternative for organisations might be to implement the technology of Quick Response Codes (QR codes). QR codes have been widely employed in many industries around the world (Choi & Sethi, 2010), but are less commonly used in the interface between retail firms and consumers. In many countries, consumers do not take an interest in scanning QR codes, thus, leaving the retail industry uninterested in developing this particular communication technology. This could be a mistake as we believe there is a great potential in developing consumer interfaces with the help of QR codes. The use of mobile devices and mobile applications for communication with consumers has become a strategy. However, QR codes might be an alternative as they are low cost and offer high value. Retail companies using QR codes today sometimes use them as smart tools i.e. sustainable consumption (Atkinson, 2013), but mostly use them for marketing promotions, such as discounts, and advertisements in a "push" format to those individuals who have the ability to read the codes. (Lorenzi et al., 2014). Some retailers, such as Uniqlo, Topshop, Ralph Lauren, and Calvin Klein, use QR codes as a tool to inform consumers about their communication strategies in order to create both good customer relationships and engagement with the brand. The traditional way of using QR codes is by placing them in media outside the fixed store, i.e. in adverts, newsletters and print campaigns. However, there are further potential opportunities to develop the use of QR codes in-store. A retail firm can give consumers instant information in-store, such as product information, sourcing and carbon footprint (Choi, 2013), entertainment (Fino et al., 2013), and decision support (Higgins, Wolf & Wolf, 2014). Retail firms can also offer consumer value with QR codes in providing the opportunity to scan the code, pay for the product and then leave the store without having to pass the cashier. Opportunities are endless but we know too little about consumer attitudes towards the use of QR codes in-store and what kind of value sought that might lead to a change in behavior and more consumers wanting to scan QR codes. The purpose of this paper is to investigate consumer attitudes and perceived value in using digital aids in store.

This paper reports from a study on Swedish consumer attitudes toward using mobile devices in a retail setting, with specific focus on QR-codes. The reason for studying Swedish consumers is that Sweden is a market highly penetrated by mobile use (Westlund & Bohlin, 2008; Kalba, 2008; Sharma, Li, & Govindraj, 2014). The aim was to gain an insight into how consumers value QR codes in-store, and what would make them actually scan one in the store. This paper identifies potential consumer value in using QR codes and suggests a strategy for educating consumers so as to achieve increased profits within the retail sector. The contribution lies in adding to our understanding of perceived consumer value as well as providing the sector with valuable information on business and innovation opportunities. It is suggested by this study that the newest technology is not always necessarily the most innovative. It is thus proposed that retailers, by comparison, with small means and "old" technology can provide consumers with value in an innovative and consumer-driven way.

2. Methodology

The data sample consists of 150 in-store surveys conducted at two different

Swedish[1] retailers: one speciality store (1) and one home-textile store (2). Both of the retailers are retail chains and their target groups are women within the age range of 25-65+. The surveys were conducted after an in-store field experiment that customers were asked to attend, and the data collections were made on two Saturdays in November-December 2013. In order to inform all customers about the field experiment, information was given in the stores when customers arrived. The design of the experiment included a big sign on a specific product with the message "Scan the QR code and get more information about this product". Each customer that passed the product were asked if they knew what a QR code was, and if they had a scanner on their cell phone. If they did not have a scanner, the interviewers lent them a cell phone and asked them to scan the code and read the product information provided in a web based format on the phone's display.

When the respondent had scanned the QR code and obtained extra information about the chosen product, they were asked to take part in a survey. The questions were constructed so as to measure the potential reasons for wanting to scan a QR code in-store, plus open questions on what kind of value the respondent might perceive when using the technology. The survey also wanted to know the perceived reasons and barriers for not wanting to scan a code in-store.

3. Literature Review

Technologies developed over the past 20 years have changed the way consumers shop with advancements in various technologies; faster transmission of data results in the ability of customers to immediately react to inventory and pricing issues (Fiorito et al., 2010). The QR code was designed to allow its contents to be decoded at high speed and was originally introduced to the retail industry as an inventory management tool to cut lead times in the supply chain (Iyer & Bergen, 1997). Its purpose was to track vehicles during manufacture and it was designed to allow high-speed component scanning (Furth, 2011). There has been little research undertaken on QR codes and the reasons for consumer use. However, studies on the importance of awareness and familiarity towards QR codes conducted by Okazaki, Hirose, and Li (2011), and Okazaki, Navarro & Lopez-Nicholas (2011), indicated that consumers prefer to access QR code information from home. Another result from the above mentioned studies is that the main motive for scanning a QR code is when the consumer is given a promotional offer, such as a discount. Other research on motives for using new technology support these findings and over time there have been numerous "new products and services", proving the concept that push-strategies work when innovation comes from the recognition of technological feasibility and the opportunities for commercialization (Cotterman et al., 2009). Examples of new products pushed to the consumer market are supermarkets enabling self-service instead of service over the counter, the microwave-oven, self-scanning in-store etc. On the other hand, new technologies might successfully be introduced to the market if there is a market pull (or consumer demand). One important variable for such a success is that the user perceives the innovation as valuable. Often, new technology is introduced to a market by both pull- and push strategies. In terms of the latter, education might be an effective tool in adaptation and gaining market shares (Dabija & Pop, 2013; Risley, 2012).

Retailers innovate in a different way compared to traditional innovation intense sectors (Sundström & Radon, 2014). Retailers are often left with the "feeling" of why something works and why something else does not. The nature of retailing innovation is, according to several studies, insufficiently researched (Reynolds & Hristov, 2009; Tether, 2005; Miles, 2000).

[1] Sweden has a population of 9.7 million people (http://www.scb.se/be0101/)

Innovation is mainly focused on technology, leaving retail innovation aside. As Reynolds et al (2007) state "*in measuring innovation, we tend to fall back upon easily derived metrics – such as number of patents, or levels of R&D spending*" (p. 649). Hence, there is a need for new perspectives on what consumers' value, and to identify what the most important benefit is when using service-technology as the basis for innovation.

3.1 Contemporary Knowledge of QR Codes and Consumer Use

A survey taken of 46,000 Swedes and their knowledge and use of QR-codes showed that 10.8% of Swedish consumers had scanned a QR-code in the previous three months (Orvesto Konsument, 2012). In the same survey, it was also evident that a minority of users are younger and more educated than average, and are curious about new technology and high-tech products. These results fit well with earlier research studies on adoption in terms of self-service, and gender (Elliott & Hall, 2005). We know that younger consumers are more interested in experimenting with new technologies, such as electronic banking (Kolodinsky, Hogharth & Hilgert, 2004), and wireless Internet (Lu et al., 2003; Pagani, 2004). We also know that the majority of users tend to adapt to new technology if the technology itself provides superior customer value and obvious benefits to the user (Sundström, 2007; Rogers, 1962; Rogers & Shoemaker, 1971). Thus, one explanation for the lack of interest by Swedish consumers in using QR-codes can be attributed to, on the part of the retailer, not having succeeded in providing tangible value for the user. However, in other countries we see a somewhat different development, where North American consumers, scan QR-codes in-store (Atkinson, 2013; Brynjolfsson, Hu, & Rahman, 2013).

One explanation for this is that QR-codes are more often used to offer the consumer a discount or otherwise beneficial offer.

From a theoretical stand-point, this is an interesting phenomenon since a classical push strategy builds on the premise that someone (often the marketer) sends out a convincing message to someone else (often consumers). However, the use of QR-codes does not seem to follow this theory, even if this is believed by many. QR-codes require actual action from the receiver in order to receive (or in this case retrieve) the message. For this reason, the use of QR-codes is actually seen as a pull strategy and are often seen by the receiver as relevant and meaningful (Atkinson, 2013).

Regardless of whether QR-codes in-store can be classified as a push or pull strategy, Swedes knowledge of them is low. It has, however, become more common that Swedes download specific apps to their cellphones in order to find a particular store or one that offers help with shared purchasing lists etc.

4. Results

In total, 172 customers were asked to participate in this study and 150 respondents chose to attend. The respondents were aged 19 – 59 years with an average age of 39 and with a skewness of -0,281. The sample was distributed as in the table below. The size of the sample, however, does not provide us with enough data to generalize according to age, although the analysis is interesting within the sample.

There were 20 male and 130 female respondents within the sample, representing the target groups for both retail stores. All of the participating consumers stated that they owned a smartphone. The majority of the respondents claimed they knew what a QR code was when they were presented with one (83 respondents), with 67 people stating they did not know what it was. There was a widespread assumption that if one scanned a QR code, one would then receive a lot of unwanted e-mails. This can be illustrated by the following: "It seems unnecessary to scan a code, because I don't want a lot of junk mail". Other comments were "it seems unnecessary, it

gives me no value", and "it takes time". All of these comments illustrate the barriers for scanning QR codes in-store. Of the respondents, only 15 customers claimed that they had scanned a QR code before. Comments received from respondents who claimed they had scanned a code were as follows in the table below:

Table 1: Why They Had Scanned a QR Code Before

I was curious	10 respondents
I wanted some entertainment	2 respondents
I expected something fun	1 respondent

Analyzing the sample by age indicates that respondents from the age of 41 to 59 might consider scanning a QR code in-store provided they would receive some form of gratification or promotional activity. The respondents aged 19 to 41 might consider scanning a QR code in-store for different reasons. However, only two of the respondents claimed that they would use a QR code if they were given a gratuity. The reasons for scanning QR codes are presented in the table below and cross tabled with the age of the respondents:

Table 2: Reasons for Scanning

Variable	Scale	All sample count
Reasons for scanning QR codes in-store	When I see no one to ask	20 (13.4 %)
	When I am in a hurry	12 (8.0 %)
	When I may receive a gratuity or there is a promotional activity	56 (37.6 %)
	When I want to know more about a product	61 (40.9 %)
	Total	149 (100 %)

Table 3: Reason for Scanning by Age-group

Scale	19-40	41-59
When I see no one to ask	20 (26.7 %)	0 (0 %)
When I am in a hurry	12 (16.0 %)	0 (0 %)
When I may receive a gratuity or there is a promotional activity	0 (0%)	56 (75.7 %)
When I want to know more about a product	43 (57.3 %)	18 (24.3 %)
Total:	75 (100 %)	74 (100 %)

Using age as a tool for analysis also show that, of the respondents aged 19-40, 14 out of 15 claimed that they had scanned a QR code before. However, when asked why, hypothetically, they might consider scanning a QR code outside of the retail store context, we did not obtain the same pattern of answers according to age. In this situation, the majority of the respondents claimed that a motive for scanning would be a gratuity of some kind. At the end of the interview, we also asked the respondents what they would most likely do if they were in a retail store and needed product information but all the store employees were occupied. This was an open question where the respondents could express their intentions. One of the most common answers is illustrated by the following comment: "Then I would pick up my cellphone and google", regardless of what age the respondents were. However, among respondents aged 44 to 56, the majority of them also said that they would call a friend or peer, wait for help if they had the time, or leave the store. This indicates that younger respondents would try to find the information they needed on their own, but older respondents would not.

When faced with the experiment of scanning a QR code and receiving product information on their cellphone, all of the respondents found the information valuable. The use of pictures of the products was valuable. However, the most important value was from describing the product in text. When the respondents were asked to give suggestions on how to add extra value

to the product information, we received a lot of suggestions regarding presenting the products as a film. Respondents wanted to know how to use the product (a slow-feeding net for horses) and how to arrange products (curtains). They also suggested that information could be given on complementary products and suggestions based on "what other customers also bought". Results from this field study indicate that consumers might find added value when scanning QR codes if the information they receive is related to the product or the consumption of products. There were also strong preferences for information formats that, at the same time, could add entertainment value.

4.1 Reasons for scanning QR codes

When asked about the reasons for scanning QR codes in the specific stores there were four options: (1) When I see no one to ask, (2) When I am in a hurry, (3) When I may receive a gratuity or there is a promotional activity and, (4) When I want to know more about a product. The answers were distributed as follows:

Table 4: Reasons by Gender

Scale	All sample count	Women	Men
When I see no one to ask	20 (13.4 %)	16 (12.4%)	4 (20%)
When I am in a hurry	12 (8.1%)	12 (9.3%)	0 (0%)
When I may receive a gratuity or there is a promotional activity	56 (37.6%)	51 (39.5%)	5 (25%)
When I want to know more about a product	61 (40.9%)	50 (38.8%)	11 (55%)
Total	149 (100%)	129 (100%)	20 (100%)

One respondent chose not to answer the question. The respondents were, as mentioned earlier, mostly women (129 or 86%) and it is therefore difficult to draw any conclusions regarding gender differences. Due to the small number of observations from the male group it is not possible to significantly test the groups. However, as can be seen above, there are no major visible differences in the limited material available.

Considering the difference in technology usage between younger and older generations (Pagani, 2004; Lu et al., 2003), it was interesting to test for differences regarding age. By splitting the material into respondents below and above 40 years of age, a significant difference between the groups was detected[2]. The results indicate that older respondents are more likely to scan a QR code when they receive a gratuity or there is a promotional activity. The younger respondents have stated all the other reasons except when receiving a gratuity or there is a promotional activity. The main reason for younger respondents to scan a QR code is to find out more about a product, but they also stated when they saw no one to ask and when they were in a hurry, although to a lesser extent.

Since the study was conducted in two different stores, there was a need to confirm that the results were not based on age differences between the respondents from the stores. The age difference between the stores was not large enough to be significant, although there were slightly more respondents in the 40+ category from store 1, and the opposite applies to store 2.

Table 5: Age Groups by Store

	Age 19-40	Age 40-59	Total
Store 1	32 (44,4 %)	40 (55,6 %)	72 (100 %)
Store 2	43 (55,1 %)	35 (44,9 %)	78 (100 %)
Total	75 (50 %)	75 (50 %)	150 (100 %)

When testing the respondents from each store separately, the sample is not large enough to obtain a satisfactory significance test. Both cases indicate the same

[2] *p*-value 0.000, df 3, Chi-Square-value of 98.244

results as found for the whole population[3] but due to the small population, the expected count is too low in both cases. The indication does, however, not contradict the result for the entire sample.

It is also possible to detect a significant[4] difference between stores. The difference indicates that respondents from Store 1 use QR codes to know more about a product to a greater extent while respondents from Store 2 use a QR code when they see no one to ask. If we separate the groups, we see a similar result in the younger group[5]. However, no significant result was visible for the older group. It is likely that the reason for the younger groups effect on the overall result was because their results were spread more widely among the reasons, while the majority of the older groups result (56/75) gave the same response alternative (gratuity or promotional activity) and was divided equally between the both stores.

To conclude, the results show that there is a dependence of age when using QR codes. Older respondents used a QR code when there was a gratuity or promotional activity connected to it or when they need information about the product. Younger respondents used a QR code for various reasons, mostly to get information about a product, but also when they couldn't find anyone to ask or were in a hurry. Amongst the younger respondents, a dependence on store was also detected, indicating that QR codes are used for different reasons in different stores.

5. Discussion

The results of the empirical material show significant differences between age groups, not in the actual usage of QR-codes, but with regard to how they value QR-codes and what would make them actually use one. While the consumer group of 40-years old and upward expressed that they would pick up their mobile phone and scan the QR-code if given a discount, the younger group (up to 40 years old) did not value a discount but would scan a QR-code if there was entertainment value in doing so. Interesting to note is that the store itself (for example the ability to find someone to ask, potentially how good the website is) has an effect on the different main uses of QR codes for younger respondents.

Except for these differences, the material also reveals low levels of knowledge of QR-codes and that the actual usage is also low. These results, in light of the increased attention from retailers in using mobile devices to communicate with consumers, as well as investment in other digital aids so as to increase profits, show discrepancies between the perceived value of digital aids by the retailer and the value experienced by the consumer.

Retailers are using existing, and relatively inexpensive, QR-code technology to communicate with consumers but are not using it to its full potential. Consequently, the innovation aspect is lost and important consumer value that could be provided and that would eventually lead to increased profits is also lost. Given the perceived value experienced by consumers in using a QR-code, there is a great need for retailers to push the innovation aspect of an already existing technology in order to give actual consumer value. This study shows a small sample from two different retailers and does not offer generalizations on consumers' use of QR-codes over a broad spectrum, but it does highlight the discrepancies between consumers and retailers when it comes to the perception of value from this technology. It also pinpoints the possibilities of innovation in existing digital aids for communication with consumers. We do not offer a golden solution for technological advancement in retailing, but stress the great importance of building on existing knowledge through innovation in order to

[3] Store 1: *p*-value 0.000, df 3, Chi-Square-value of 41.863 (50 % cells with expected count under 5)
Store 2: *p*-value 0.000, df 3, Chi-Square-value of 55.972 (25 % cells with expected count under 5)
[4] *p*-value 0.015, df 3, Chi-Square-value of 10.519
[5] *p*-value 0.014, df 2, Chi-Square-value of 8.581

provide consumer value that can lead to increased profits for retail firms.

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