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# Are QR codes here to stay or are they a thing of the past?

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## ABSTRACT

Quick response (QR) codes, a type of two-dimensional barcode, are a marketing tool used all around the world. Particularly, in Japan and China QR codes have been gaining popularity. Early adopters with higher education and recent promotional marketing campaigns are utilizing this mobile, information-sharing tool. QR codes are now widely used as a marketing tool by many companies. This research investigates consumers' perception of QR codes. An increasing amount of firms and sales representatives are using QR codes as a channel to market their products/services to their customers' mobile devices. The following questions will be the focus of this study:

1. What are the factors that impact consumers' attitudes towards QR codes?
2. Does the location of the code have an effect on the attitude towards the QR code?
3. Do consumers have a more positive attitude towards QR codes when they are aware of the destination/ information that will be presented?
4. Does one gender have a more positive attitude towards QR codes over the other gender?
5. Does the availability of QR codes prevent or enhance a positive attitude towards QR codes?
6. Are consumers more likely to have a positive attitude towards QR if they know that they will be led to a coupon by scanning?

The data was collected through exploratory/descriptive research to record what QR users think about the application and how useful it is to them. The study included a collection of secondary data from various sources as well as a pre-test that was distributed to 15-30 students. Then primary data was collected from an online survey created with appropriate measures.

## METHODOLOGY

Our main variable of interest is the dependent variable: attitude towards QR codes. We include the other variables such as smart phone ownership, motivation, education level, knowledge of QR destination, frequency, incentive, gender and control variables age, major, and hometown. Multiple regression was used to test our hypotheses. The following is our regression equation:

$$\text{Attitude towards QR Codes} = a + \beta_1(\text{Appit}) + \beta_2(\text{Motivation}) + \beta_3(\text{Recencyit}) + \beta_4(\text{Genderit}) + \beta_5(\text{Education levelit}) + \beta_6(\text{Knowledge of QR destinationit}) + \beta_7(\text{Trafficit}) + \epsilon$$

## Sample Design and Data Collection Method

Data was gathered from both experienced and inexperienced users of QR codes. However, the non-users only answered demographic questions. These questions helped identify the

profile of QR users versus the profile of non-users. Additionally, the respondents answered questions about their overall perception of the codes regardless of use.

## **LITERATURE REVIEW**

### **Introduction**

Quick response (QR) codes, a type of barcode, are making advances in the global market. Early adopters with higher education and recent promotional marketing campaigns are utilizing this mobile, information-sharing tool. They are now being widely used as marketing tools by many different companies. The literature review discusses the attitude towards QR as well as related variables such as smartphone ownership and possession of the application to scan a QR code. Knowledge, education, incentives, recency, gender and location are also discussed.

### **Consumer Attitude Toward QR Codes**

The consumer attitude towards QR codes has recently become a topic of study by marketing research. The technology has not been in existence long enough for most academic journals, but we can still find evidence of why it is an important variable to study. Since QR codes are an image that brands use to connect with consumers, evidence in the many articles about attitude towards advertising. Gardner (1985) researched the relationship between attitude towards the advertisement and attitude towards the brand. The research design implemented by Gardner was experimental, and used a sample of 136 undergraduate students at one university (Gardner 1985). The conditions involved exposure to branded and unbranded advertisements, then the subjects recalled what they remembered about the ad content as well as the brand (Gardner 1985). A result of the study was that “brand-related beliefs relate positively to attitude towards the advertised brand under both brand and non-brand set conditions” (Gardner 1985, p.197). When considering QR codes, the recall of the ad around the code is typically not as important as the information that the code leads you to interact with, but the code must first do its job of persuading consumers to scan it in the first place. If we refer to the results of Gardner, the attitude towards a QR code as an advertisement would be positively correlated with the attitude towards the brand that is using the code. This drives home the point that the consumer attitude towards these codes is a vital variable in a brand’s QR success.

Sengupta, Goodstein and Boninger (1997) tested the consistency of attitude and the use of low involvement conditions. The study had two purposes, the first of which was to prove that diverse low-involvement signals will lead to diverse levels of attitudes. Secondly, the researchers predicted that with low-involvement settings, “when both related and unrelated peripheral cues evoke similar initial attitudes, only when the cue is related to the product category” will consumer’s attitudes remain consistent (Sengupta, et al. 1997 p. 351). The researchers focused on finding what low-involvement settings led to the consistent formation of attitudes. They studied how different levels of attitude consistency can be changed by certain features of an ad but still in a low-involvement context. The research was done in two studies; first the researchers tested the significance of “message involvement, cue relatedness, and argument strength” which was collected in two different stages (Sengupta, et al. 1997, p. 353). The second part of the study was to test the strength of the results of the first study by manipulation some factors (Sengupta, et al. 1997 p. 355). The first study had 79 participants

that were in their first year of an MBA program at a West Coast University while the second study used 95 MBA students, both sets were volunteers who were promised a chance to win a cash prize (Sengupta, et al. 1997 p. 353-356). The sample size of the following QR code study will use a similar sample size and age demographic. The research was descriptive in nature since it collected quantitative data in order to answer their research questions. The results of their study supported their predictions in that different levels of signals led to different levels of attitudes. The findings of this study are relatable in that attitude and the consistency of attitude can be influenced by many factors. Although the interactive nature of QR codes require high-involvement, the image itself is a very low-involvement cue as a form of advertising. The following study will look at several factors that could have positive or negative association with attitude towards quick response codes. We believe that some differing factors such as location, knowledge and benefit will have an effect on the consumer's attitude towards quick response codes.

The studies of Sternthal and Myungwoo that were conducted in 2008 support the concept that the evaluation of a target brand is influenced by its presentation in the context of advertising. The effect of context depends on the decision maker's knowledge of the brand and the accessibility of the information. In a base study, participants who were considered experts exhibited an assimilation effect and novices a comparison contrast effect (Sternthal and Myungwoo 2008). In an assimilation effect, the stimulus differences are small; if they are large, contrast tends to occur. An increase in the accessibility of the contextual information led to a contrast effect among experts and an assimilation effect among novices. A reduction in the resources available for processing the highly accessible information resulted in experts engaging in assimilation and in novices exhibiting a comparison contrast. These findings are explained in terms of an interpretation and a comparison judgment process.

The views of experts compared to novices are directly correlated with attitudes towards particular target brands. In this particular study it was the views of BMW automobiles compared to Hyundai automobiles and how the amount of information that was known correlated with the end results. A two process view suggests that a consumer's knowledge about a particular category in which the target brand holds meaning to is a very important determinant to them and how the brand environment should be managed. Assuming that there is ambiguity about the quality of a brand, when consumers are highly knowledgeable about the category, it is important that the context be composed of positively evaluated brands to take advantage of the anticipated assimilation effect (Sternthal and Myungwoo 2008). At the same time, efforts should be made to ensure that the context in which the brand is presented is not blatantly related to the brand to prompt correction contrast. When consumers are less knowledgeable, the preferred context of the target brands quality is likely to stand out as a superior advantage of the anticipated comparison contrast. During the comparison contrast, novices were studied with experts. Novices were expected to focus on the message of the information rather than the context like the experts. Also examined in the study were responses of experts by assessing whether providing novices with the processing strategy thought to be used by experts would result in novices exhibiting assimilation (Sternthal and Myungwoo 2008). Participants who have a greater experience level of QR codes will in fact have a better attitude towards them. On the other hand if the participants have no experience and are new to the subject of QR codes, they will most likely have a different attitude towards

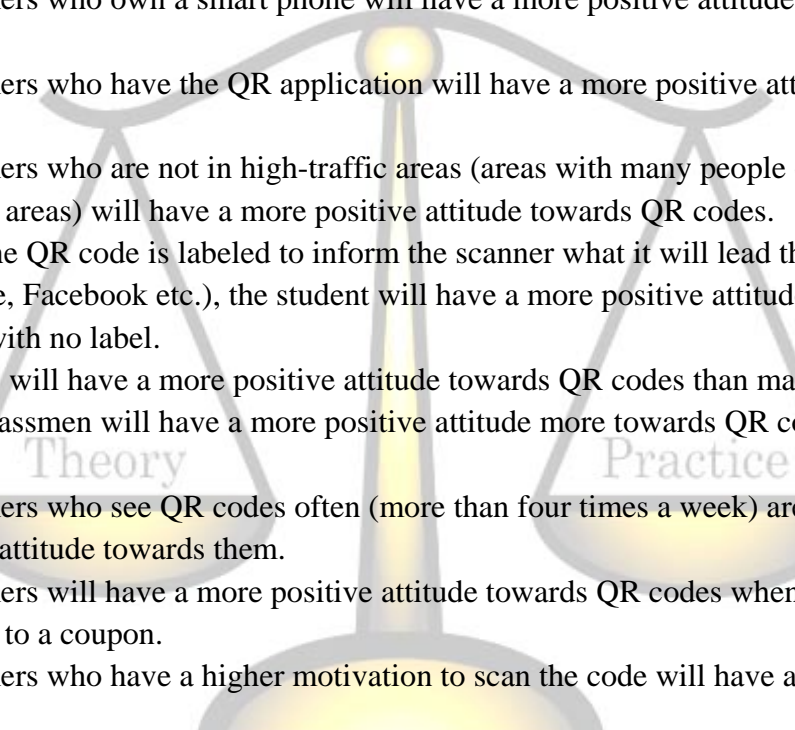
them. In a two process view of QR codes, an individual who is knowledgeable about QR codes will have a better attitude towards them and understand what they are for. Knowledge of QR codes is an independent variable that is studied further below. This study raises awareness of what kind of consumer is a potential QR code user. Brands can find that information useful when considering what medium to utilize when reaching their target market.

### **Summary**

Although companies can benefit from the background research listed above, they are unable to sift through the research to identify the attitudes students have towards QR codes. The research will be valuable to firms who are interested in directing their marketing efforts towards QR codes with their target market.

### **HYPOTHESES**

The predicted outcomes of our study are reflected in the hypotheses of the research questions.

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- H1. Consumers who own a smart phone will have a more positive attitude towards QR codes.
- H2. Consumers who have the QR application will have a more positive attitude towards QR codes.
- H3. Consumers who are not in high-traffic areas (areas with many people or areas without privacy or busy areas) will have a more positive attitude towards QR codes.
- H4. When the QR code is labeled to inform the scanner what it will lead them to (a coupon, website, Facebook etc.), the student will have a more positive attitude towards that code than one with no label.
- H5. Females will have a more positive attitude towards QR codes than males.
- H6. Underclassmen will have a more positive attitude more towards QR codes than upperclassmen.
- H7. Consumers who see QR codes often (more than four times a week) are more likely to have a positive attitude towards them.
- H8. Consumers will have a more positive attitude towards QR codes when they know that they will be led to a coupon.
- H9. Consumers who have a higher motivation to scan the code will have a more positive attitude.

### **Pre-test**

Through pretesting of 12 students, we found that ten students owned smartphones. We also found that the eight students who had a smart phone all had access to the internet through their smart phone, but that only four (50% of them had the QR application). From this data, only four out of the ten students have access to using the QR codes.

We thought it was important to scale how often students see QR codes, whether it is on a daily, weekly or monthly basis. The four students who have seen them in the past week saw them at least once, and the same four students claim to have seen them at least five times in the past month. The interesting part is that three of the four students did not scan at all in the past month, and one student scanned 1-5 times.

The section of the pre-test survey with pictures of QR codes was testing to see if there is any difference in attitude towards whether a student would be more/ less likely to scan a QR code

if there is an isolated code, or if there is a caption explaining what it will show them. The results showed:

Which QR code would you scan?	a	Percentage	b	Percentage	n
Ralph Lauren	2	50%	2	50%	4
Pepsi	4	100%	0	0%	4
Best Buy	1	25%	3	75%	4

### CONCLUSIONS AND RECOMMENDATIONS

The results of this study have indicated that using QR codes as a medium to connect with their target market can be ineffective. QR codes are useful for companies to instantly direct consumers to online marketing efforts, but the consumers' involvement level is low which makes the codes trivial and useless in most marketing efforts. There were many respondents who did not understand the concept of what a QR code was, and there were also many who lacked the motivation to scan them. Companies who use QR codes should keep in mind that consumers may become more involved with the codes if it becomes a common action among a large amount of consumers. Unless more people become aware of what they do, a scanning fad may never exist.

The most significant finding was that the majority of respondents were more likely to scan QR codes out of curiosity and if they knew where the code would take them. This can become difficult for marketers to work around because not only should they grab the attention of the consumer, but also provide information about the code's destination while creating a feeling of suspense and wonder. A recommendation of how to maintain these attributes without being an annoyance to the target market could be to add humor on the labels that explain the destination. Marketers would like to see a more positive attitude towards these codes because they can be very beneficial and useful. However, according to this study, there are more respondents with a negative or unbiased attitude towards QR codes than those with a positive attitude.

An additional finding that is important for firms to consider is that the majority of respondents were least likely to scan a code if they knew it took them to a Facebook or Twitter page. One recommendation related to this issue is that the firm should create a landing page that contains multiple routes or web pages related to its company in order to give the scanner an option of where he/she would like to navigate to in their search. Respondents claimed to be more willing to scan QR codes in low-traffic areas, free from large groups of people and distractions. Firms may want to consider placing QR codes in magazines, flyers, packaging, coffee cups, gas pump ads, movie tickets, sports tickets, and other tangible places where the consumer is idle, rather than placing the code where it will be overlooked.

As expected, the strongest motivating factor to stimulate consumers to scan QR codes was the redemption of a coupon or another form of incentive. A recommendation for firms to consider would be to use this form of marketing to create a fad for scanning the codes among younger adults. The results from the study showed that QR codes were accepted most among mature audiences with higher education levels, and less of that among younger audiences. Thus, if a firm wanted to interact with a younger market using QR codes, they may not be as

successful unless they find an appealing way to stimulate the young adults to start scanning codes more often.

QR codes and their campaigns would be more efficient if their purpose and reward was clearly explained. Communication about the value of QR codes is critical, just like communicating value through any other marketing communication tool. Consumers do not want to waste their time with data or products that are not relevant for them. Individuals need to know what the QR code will do for them. If they do not perceive it quickly, their attention will not be gained, and neither interest, nor desire will be provoked.

### **LIMITATIONS**

We know from pre-testing that most students own a smart phone, but a significant drawback is that not all of the participants in the study could give substantial feedback because they do not have the QR application on their phone. It is a hindrance towards our study to be unable to determine the attitudes towards the codes. However, it does give the company great insight about the percentage of QR users from our non-probability sample. An additional limitation is that the original sample size was 98, but only 57 of the respondents had data that could be statistically analyzed because the remaining 41 respondents did not possess a QR application. A disadvantage of QR codes is that newer technologies, such as Snap Tags, could interfere with the conclusions in this particular study.

### **FUTURE RESEARCH**

Future research should include new technologies such as Snap Tags vs. QR codes. Studies like this will enable individuals to make a decision on two mobile technology perspectives. Purchase intentions can also be a valuable insight to research in the future. Researching the purchasing intentions of how individuals perceive QR codes and what they are more likely to purchase using them can be very valuable information to businesses. Other future research may include different types of research designs. An alternative method that could be effective in determining factors that affect consumer attitudes towards QR codes would be to use experimental research design, and to observe reactions to different presentations of QR codes in different locations. The controllable variables would include the location of the advertisement, where the QR code takes you, how much information is given about the QR code on the advertisement, size of the code, and many more. We would not only be able to track the number of scans for our codes, but we would gain insight by observing the interaction that the respondents have with the code. This would take much more time and planning, but it could be beneficial to future study should those resources be available.

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